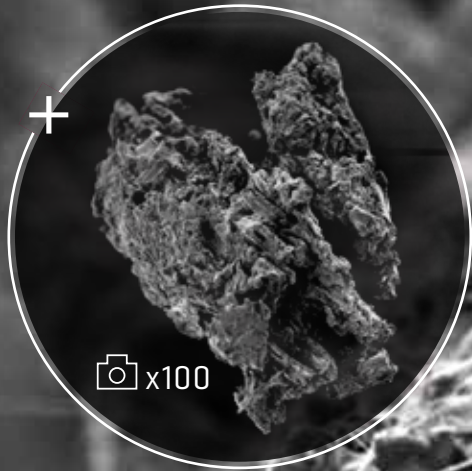


SUMMER 2023  
VIRGINIA TECH MAGAZINE

DESTINATION: DREAM JOB  
Alumni reflect on the value of internships

ROAD WISE  
Thirty years of transportation innovation



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ZOOMING IN ON

micro **plastics**  
tiny particles creating big challenges



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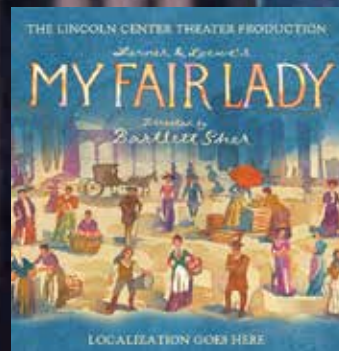
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Madeline Powell as Eliza Doolittle in the National Tour of *My Fair Lady*. Photo by Jeremy Daniel.



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## ASHES TO ASHES

Menwa Besheer, a rising junior in aerospace and ocean engineering, in the E2E (English to Engineering) program, analyzes the impact of wildfire ash on aircraft engines at Virginia Tech's Advanced Propulsion and Power Lab. E2E is an undergraduate research-led program for sustainability in aviation that is supported through a partnership between Virginia Tech and Pratt & Whitney. Watch a video showcasing the program at [news.vt.edu/videos](https://news.vt.edu/videos).

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Microplastics are everywhere. They've even been found in human blood. But what happens as these tiny plastic particles deteriorate and move around the world? How do they affect our health and the health of other living creatures? What changes can we make to reuse and repurpose plastics more effectively? Scientists at Virginia Tech are searching for the answers.

### 40 LASTING LESSONS

Why is there a push for more students to have job-related experiences during college? According to Virginia Tech alumni, whether an internship was exactly what they expected or like nothing they could have imagined, the value of the experience is immeasurable.

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**ON THE COVER:** A tire particle found in a sample of water collected from Stroubles Creek was magnified using a scanning electron microscope. Photo by Weinan Leng, instrument specialist with NanoEarth and Nanoscale Characterization and Fabrication Laboratory, using a JEOL IT500 SEM. To learn more about the photo process, see page 21. (at right) This year, Kay Castagnoli, a former Virginia Tech chemistry professor, claimed the distinction of being the oldest individual to earn a bachelor's degree at the university. At 85 1/2 years of age, she received a Bachelor of Arts in music, summa cum laude and with honors distinctions.



## PRESIDENT'S MESSAGE

A photograph of Virginia Tech President Tim Sands, wearing a maroon Virginia Tech hoodie and a baseball cap, smiling as he interacts with students at a food service area. He is handing a small item to a student. Other students and staff are visible in the background.

**SAY CHEESE:** Virginia Tech President Tim Sands enjoyed interacting with students at Cheesy Nights during finals week in May.

# PIVOTAL PROGRESS

Summer is a transitional season for Virginia Tech. During the final weeks of spring, we celebrated commencement and reconnected with hundreds of our graduates during Alumni Week-end. As our newest alumni seek out new challenges, we are preparing for the newest class of Hokies to begin their Virginia Tech experience in the fall.

Over the past few years, our university has grown stronger, and our impact is expanding across the commonwealth and beyond. This year has been pivotal in our progress as we refine our goals to support two emerging aspirations—becoming a top-100 global research university and making a Virginia Tech education accessible and affordable for more students.

Ranking in the top 100 will help us attract the kind of partners and talent that can advance our mission as Virginia's land-grant research university. This year, we saw the value of outstanding talent as three faculty members were elected to the National Academies, an important indicator of research excellence. Linsey Marr, the Charles P. Lunsford Professor in Civil and Environmental Engineering, was elected to the National Academy of Engineering, and Robert Bodner, the C.C. Garvin Professor of Geochemistry, and Shuhai Xiao, both in our Department of Geosciences, were elected to the National Academy of Sciences. I believe this is the first time three of our faculty have been recognized during one cycle.

While we continue pursuing excellence in research, teaching, and outreach, we are also addressing the fact that the Virginia Tech experience is not affordable for low- and middle-income families. We will soon be sharing more information about the

Virginia Tech Advantage—a universitywide, multiyear commitment to offer the full educational experience to qualified Virginia students regardless of income. We are committed to ensuring that all students enrolled at Virginia Tech have access to rich experiences with opportunities for research, learning, and discovery inside and outside of the classroom or lab. These experiences will prepare them for future work, service, and success in their communities.

To support our goals, we continue to invest in our infrastructure. In Blacksburg, several building projects will be completed in the months ahead, including the Data and Decision Sciences Building, the Multi-Modal Transit Facility, the Undergraduate Science Laboratory Building, and Hitt Hall—which includes a new dining facility. The Corps Leadership and Military Science Building and a new residence hall on the Upper Quad round out that list. Meanwhile, the first building of our Innovation Campus is rising in Alexandria, and we're excited about plans for the next phase of growth for the Virginia Tech Carilion School of Medicine in Roanoke, the Fralin Biomedical Research Institute at VTC in Roanoke, and in D.C. at the Children's National Research & Innovation Campus.

Thank you for being an integral part of our success. As you make plans for the rest of the summer and into fall, come for a visit. Join us for an athletic or alumni event. Take time to walk around our campuses to see what's new. I think you will be as excited as we are about the future of Virginia Tech.

Enjoy the last few weeks of summer, and let's go Hokies! ■

*Tim Sands is Virginia Tech's 16th president.*

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# LETTERS



## TO THE EDITOR

### HOKIE POINT OF VIEW

I always enjoy reading the Virginia Tech Magazine, and I have a story that your readers might enjoy. It is a story about how a first-generation college student who earned an undergraduate degree from Virginia Tech has “turned out” now that retirement is on the quickly approaching horizon. I like to think that the title of my story might be something like, “What It Means to Be a Hokie at the Age of 72.”

I earned my B.S. in psychology from Virginia Tech in 1973. My first job was as a rehabilitation counselor at the Virginia State Penitentiary in Richmond, Virginia. I later earned an M.S. in psychology at Radford University and worked in community mental health, or what I call “the trenches” of mental health services.

In 1989, after earning a Ph.D. with an emphasis in clinical child psychology and early intervention from the University of Southern Mississippi, I was offered a faculty position at East Tennessee State University. In addition to my academic work, today I am a practicing licensed clinical psychologist and health service provider in Tennessee. I have published 61 professional articles and book chapters, shared 109 presentations of my work, and my research has been noted in several publications.

I recently completed a book, “I Got Like This the Same Way You Did: Reflections from a Clinical Psychologist Who Learned to Enjoy the Passage of Time.” Hopefully, it will be published soon.

I grew up in the military, the son of a World War II veteran. All that moving around helped me grow into a person who appreciates diversity, inclusion, and individual differences.

Most of the time I have to pinch myself to believe that life can be this good.

Virginia Tech helped me develop some different ways of thinking. I never realized that I would someday not only like what I do, but love what I do. It still amazes me that I get paid to talk, think, and write. The idea that I would be working around people who inspire me and help me realize that the world can be a better place never, ever occurred to me when I was young.

I am regularly reminded of 1973, the year I graduated.

As graduation approached, I borrowed some money to buy my Virginia Polytechnic Institute and State University ring. I have a memory that it cost less than \$100, but back then, that might as well have been a million dollars. Wanda, to whom I have now been married for more than 50 years, and I got all dressed up to attend the Ring Dance.

I earned my undergraduate degree and the rest, as they say, is history. I owe what I am to my parents who taught me to be adaptive, committed, loyal, hard-working, and to think for myself.

Virginia Tech put the icing on the cake in allowing me to become a Hokie.

*Jon B. Ellis '73  
Johnson City, Tennessee*







# AROUND THE DRILLFIELD

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## NEWS

### HISTORIC VISIT TO VIRGINIA TECH

**MOKGWEETSI ERIC KEABETSWE MASISI, PRESIDENT OF** Botswana, became what is believed to be the first international head of state to visit Virginia Tech's Blacksburg campus when he and a small contingent met with Virginia Tech President Tim Sands on March 23. Masisi later gave a speech that centered on conservation, democracy, and sustainable development in his country to more than 600 people in the Commonwealth Ballroom at Squires Student Center.

Masisi received applause during his speech when he noted that more than 40 percent of Botswana's land has been dedicated to conservation. He also has enlisted Virginia Tech's assistance in studying diseases that impact wild and domestic animal herds.

"We believe that Virginia Tech can reasonably share experiences, research insights, and advances in veterinary sciences to help us improve efforts in managing and containing contagious diseases of wildlife," Masisi said.

Virginia Tech has been helping Botswana primarily through the work of Kathleen Alexander, professor of wildlife conservation in the College of Natural Resources and Environment who has been conducting research in Botswana for nearly 30 years. In 2001, she co-founded the Centre for African Resources, Animals, Communities, and Land Use to promote conservation efforts. ■

**GLOBAL REACH:** Botswana President Mokgweetsi Eric Keabetswe Masisi discussed the impact of Virginia Tech's research on his country during a speech on the Blacksburg campus in late March.



**HORSE SENSE:** Licensed Veterinary Technician Laura Dawson and Krista E. Estell, clinical associate professor, Equine Medicine work with an equine patient.

## ADDRESSING THE EQUINE CARE EMERGENCY

**THE COMBINATION OF OLDER VETERINARIANS** leaving the field, current equine veterinarians leaving for better pay and work-life balance, and fewer numbers of veterinary students choosing equine as their elective field of specialty has seriously affected the availability of primary and emergency care for horses throughout the United States.

Factoring all that while wanting to maintain a high quality of emergency care services has prompted Michael Erskine '84, DVM '88, the Jean Ellen Shehan Professor and director of the Marion duPont Scott Equine Medical Center in Leesburg, Virginia, to commit to a new emergency service model: Creating a team of board-certified emergency and critical care specialists to be supported

by the clinicians already on staff who are board-certified specialists in surgery and internal medicine.

Bridge funding has been secured to support the model, which is expected to be self-sustaining in three years.

“This emerging emergency and critical care team model will be staffed by clinicians who enjoy the challenges of emergency medicine and will reduce on-call hours required of our internal medicine and surgery clinicians,” Erskine said. “Our goal is to implement this model without increasing costs to our clients.”

The equine medical center, which hopes to launch the new model this summer, saw a 21.5 percent increase in emergency cases in 2022 over the previous year. ■

## BREAKING DOWN BARRIERS TO REPORTING SEXUAL ASSAULT



**MIRRED IN FEARS LINKED TO CONFIDENTIALITY**, re-victimization, and stigma, sexual assault remains largely underreported among college students. Allison Tobar, a clinical science doctoral student in the Department of Psychology, part of the College of Science, was drawn to the subject by the difficulty in discussing it.

Under the mentorship of Assistant Professor of psychology Meagan Brem and as a member of Brem's Research for Alcohol and Couples Health lab, Tobar will survey Virginia Tech students for their perspectives on barriers to reporting sexual assault and accessing resources for support on college campuses. The study, which is supported by the Graduate and Professional Student Senate of Virginia Tech's Graduate Research Development Program, marks the start of what Tobar hopes will be a diverse, multisite look at sexual assault on college campuses.

“There is a lot of research in this area, but we're really interested in learning what are some unique perspectives that maybe researchers haven't typically spotted but can come up within these broad questions,” she said. ■

## PAMPLIN WOMEN'S SUMMIT A SUCCESS

THE PAMPLIN COLLEGE OF BUSINESS Office for Diversity, Equity, Inclusion, and Belonging (DEIB) hosted its first Women's Summit on March 25.

The keynote speaker was Jessica Hotter, who oversees licensing for Rally House, a specialty retail store offering sports-related and local products. Hotter helps to facilitate existing licensing partnerships while pursuing new relationships. Prior to joining Rally House, Hotter worked for the Office of Licensing and Trademarks in Communications and Marketing at Virginia Tech.

"The summit is an opportunity for us to come together to talk about issues that impact us," Janice Branch Hall, associate dean of DEIB, said. "We don't often have these opportunities to be transparent and to tear off the mask by showing up authentically as ourselves. That's not the case for our summit. Attendees can engage with employers, fellowship with one another, polish those leadership skills, and really make sure their voices are heard."

Planning is underway for Pamplin's second Women's Summit in spring 2024. ■



TUNING IN: Virginia Tech researchers are joining a Children's National Hospital effort to use emerging technology that treats deadly brain tumors with ultrahigh frequency sound waves.

## CANCER RESEARCHERS TEAM UP AGAINST DEADLIEST BRAIN TUMORS IN CHILDREN

VIRGINIA TECH RESEARCHERS WITH the Fralin Biomedical Research Institute at VTC have joined a Children's National Hospital effort to treat deadly brain tumors with ultrahigh frequency sound waves.

The scientists are studying how to use an emerging technology called focused ultrasound to fight diffuse midline glioma (DMG), one of the most lethal childhood brain cancers with a nearly 100 percent rate of mortality within five years of diagnosis.

A multi-institutional team led by Javad Nazarian, a principal investigator with Children's National Hospital, will study how to use focused ultrasound to create a temporary gateway through the body's protective blood-brain barrier to deliver cancer medicine.

Virginia Tech Cancer Research Alliance investigators Eli Vlaisavljevich, a designer and developer of focused ultrasound technology, and Jennifer Munson, who creates 3D models to study brain tumors, bring expertise in focused ultrasound instrumentation and tissue engineering to the team.

Joining them is Columbia University's Cheng-Chia Wu, principal investigator for the world's first clinical trial using focused ultrasound in children with relapsed DMG. Wu is experienced in combining focused ultrasound with radiation and immunotherapy for both pediatric and adult brain tumors.

The research is funded by a \$672,000 grant to Children's National from the SebastianStrong Foundation. ■



**SUPPORT SERVICE:** A group of Virginia Tech students are practicing conversational English with a group of 12 Ukrainians as part of service learning or senior capstone classes in the Department of Human Development and Family Science.

## SPEAK UP FOR UKRAINE

**THE THOUGHT OF HAVING FREQUENT** conversations with non-native English speakers was daunting for Olivia Peterson.

But after some coaching, Peterson mastered the art of conversational English well enough to guide a Zoom breakout room of Ukrainian participants.

Twice a week and more than 5,000 miles away, Peterson and other Virginia Tech students are hosting hour-long conversations in English with Ukrainian natives who fled the country following the Russian invasion.

These Hokies, who are either enrolled in a service-learning course or a senior capstone class in the Department of Human Development and Family Science, are practicing conversational English with

a group of 12 Ukrainians who want to improve their language skills.

“Our goals are to help our Ukrainian participants build confidence in their ability to listen and speak in English and to show support and solidarity in this time of crisis,” Matthew Komelski, an advanced instructor of human development and family science, said. “And we are providing Virginia Tech students with learning opportunities that develop professional communication and leadership skills.”

For a capstone project, the students also plan, organize, and evaluate the program’s effectiveness.

Komelski launched the program, called Speak Up for Ukraine, last fall. ■

## TAKING ON THE PLASTIC PROBLEM



**IN A WORLD RELIANT ON SINGLE-**use plastics, how can people keep themselves and the planet healthy?

A team of transdisciplinary researchers from the Departments of Materials Science and Engineering and Chemical Engineering are working to answer that question. The team won grant support to begin developing biodegradable materials to displace plastics used in health care facilities. Abby Whittington, a professor jointly appointed in both departments, leads the effort.

Health care is one of the largest waste-producing sectors in the United States, according to the American Medical Association Journal of Ethics.

“Solving this problem requires us to think about the entire waste cycle from beginning to end,” Whittington said. “The team’s starting point is creating and testing new materials that can be used for food wrappers and packaging for medical supplies.”

The goals of the project are threefold: define, develop, and test the materials for plastic substitution; generate patents for those discoveries; and license and manufacture new products for industry use.

The work shows the importance of different engineering disciplines working together to solve global problems. ■

## STUDY HOPEFULLY LEADS TO DE-ESCALATION

**EUGENIA RHO, AN ASSISTANT PROFESSOR** in the Department of Computer Science, is the lead author of a new research paper that illustrates how a law enforcement officer's first 45 words during a vehicle stop with a Black driver often can indicate how the stop will end.

"We found that there's a key difference in how officers talk to Black drivers during the first moments of stops that end in an arrest, handcuffing, or search versus those that don't end in such outcomes," said Rho, who leads the Society, AI, and Language research lab at Virginia Tech. "The officer often starts with a command rather than a reason in escalated stops."

Published in the Proceedings of the National Academy of Sciences of the United States of America, the peer-reviewed research found that the stops ending in escalation were almost three times more likely to begin with the officer issuing a command to the driver and 2 1/2 times less likely to provide a reason for the stop.

"We want this study to really start conversations around how we can inform training around de-escalation practices for law enforcement and potentially a better understanding of how to facilitate relations between Black communities and law enforcement as well," Rho said. ■



**COASTAL QUANDARY:** Three College of Natural Resources and Environment professors, including Ashley Dayer (at left) and Elizabeth Hunter, are using a grant to study the impacts of sea-level rise on Virginia's coastal communities.

## RESEARCHING SEA-LEVEL RISE IN VIRGINIA

**THE IMPACTS OF SEA-LEVEL RISE ON** landscapes are one of the looming environmental questions Virginia faces in the coming decades.

Now, a grant from the NASA Land-Cover and Land-Use Change Program will fund a collaborative research project led by three professors in the College of Natural Resources and Environment to model how those impacts will be felt by coastal communities in Virginia and elsewhere.

"There are two questions that guide this project," said Elizabeth Hunter, assistant professor in the Department of Fish and Wildlife Conservation and assistant unit leader of the U.S. Geological Survey Cooperative Fish and Wildlife Research Unit. "The first is: Can we use satellite imagery to detect where landscape change is happening from sea-level rise? The second is: What are landowners doing in response to those changes?"

Hunter, along with Fish and Wildlife Conservation Associate Professor Ashley Dayer and Professor Valerie Thomas of the Department of Forest Resources and Environmental Conservation, plan to

create a predictive model that will help landowners, conservationists, and stakeholders better anticipate how humans and ecosystems might adapt to the specific challenges of sea-level rise.

The challenge of sea-level rise starts in the salt marshes: the brackish, intertidal zones between land and open ocean. This ecosystem is a critical—and critically threatened—habitat for wildlife. ■



EXTRA, EXTRA!  
READ ALL ABOUT IT.

For additional details, images, and videos related to the stories featured in Drillfield, go to [news.vt.edu/magazine](https://news.vt.edu/magazine).





**TECH SUPPORT:** Sheena Deivasigamani participated in Virginia Tech's innovative Chip-Scale Integration curriculum that had students work on a project with Micron Technology Inc. during the 2022-23 academic year. She is an intern with Micron this summer and will return as a graduate student in the fall.

## VIRGINIA TECH PARTNERS WITH MICRON TECHNOLOGY INC., NATIONAL SCIENCE FOUNDATION, AND 10 OTHER UNIVERSITIES TO DEVELOP SEMICONDUCTOR TALENT

**VIRGINIA TECH IS A FOUNDING** member of an 11-university network spanning the U.S. and Japan that has partnered with Micron Technology Inc. and the U.S. National Science Foundation to cultivate a more diverse and robust talent pipeline for the semiconductor workforce.

Boise, Idaho-based Micron announced the partnership, known as UPWARDS for the Future, on May 21, at the edge of the 2023 G7 Summit in Hiroshima, Japan. Together, Micron, the U.S. National Science Foundation, and the university partners will invest \$50 million to launch the initiative. UPWARDS for the Future is designed to deepen ties between industry and higher education, promote industry-backed curriculums, and advance collaborative semiconductor memory research. The initiative is projected to involve 5,000

students over five years, with an emphasis on engaging women in engineering.

"Virginia Tech is proud to partner with Micron and leading U.S. and Japanese universities to support economic innovation by advancing growth and diversity in the semiconductor workforce," Virginia Tech President Tim Sands said. "Our top-ranked electrical and computer engineering department is educating the next generation of engineers with 10 specialized areas of study including a major in chip-scale integration. UPWARDS for the Future is aligned with Virginia Tech's commitment to increase diversity in STEM education by fostering inclusion and success for women and individuals from underrepresented and underserved communities."

Along with Virginia Tech, partner universities in the UPWARDS for the Future initiative from the U.S. are Boise State, Purdue, Rensselaer Polytechnic

Institute, Rochester Institute of Technology, and the University of Washington. Partner universities from Japan are Hiroshima University, Kyushu University, Nagoya University, Tohoku University, and Tokyo Institute of Technology.

According to Micron, the founding universities were selected "for the work they have done to close the gender equity gap in STEM by fostering diversity, building inclusive career pathways for their students, and promoting equality in leadership roles with the appointments of female deans and presidents."

The UPWARDS for the Future initiative is in line with a major push at Virginia Tech to help fill a domestic gap in the pipeline for skilled labor in semiconductor technology. In the U.S. alone, companies are projected to face a shortfall of 300,000 engineers and nearly 90,000 skilled technicians by 2030, according to McKinsey and Company. ■

## SNIFFING OUT SPOTTED LANTERNFLY



FROM NEW YORK TO NORTH CAROLINA and as far west as Illinois, the invasive spotted lanternfly keeps causing chaos to agricultural and forestry industries essential to many regional economies. Officials in infested states have brainstormed different approaches to stop the spread of the lanternfly.

Now, researchers in Virginia Tech's College of Agriculture and Life Sciences are experimenting with a new approach and calling upon dogs for assistance.

With a four-year, \$475,000 grant from the U.S. Department of Agriculture-Agriculture and Food Research Initiative, Erica Feuerbacher, associate professor of applied animal welfare and behavior in the School of Animal Sciences, and Mizuho Nita, Virginia Cooperative Extension specialist and associate professor in the School for Plant and Environmental Sciences, have partnered with researchers at Texas Tech University to attempt using dogs' scent-detecting skills to sniff out spotted lanternfly eggs.

Early detection is critical to stopping the lanternfly, which feeds on plants and steals their nutrients. ■

## NEWS

VIRGINIA TECH VIDEOGRAPHERS HAVE BEEN HARD AT WORK CAPTURING THE UNIVERSITY'S NEWS AND EVENTS. CHECK OUT THIS SAMPLING AND MANY OTHERS AT [NEWS.VT.EDU/VIDEOS](https://news.vt.edu/videos).



### Hoda Kotb '86 reflects on her college experiences

The co-anchor of NBC News' TODAY sat down with Dawn Jefferies, senior producer for strategic initiatives, early this spring to reflect on her time at Virginia Tech and how being a Hokie continues to impact her life.



### Students learn to graft fruit trees

Instructor Josh Kardos and his Plant Propagation students welcomed Senior Extension Agent Jon Vest to an afternoon lab where the students learned to take a cutting from one tree and making make trees out of it.



### Disciplines merge in engineering capstone course

Undergraduates from a variety of disciplines are working in the College of Engineering's Interdisciplinary Senior Design Capstone course, which allows them to work on a project and showcase the skills they have learned.



### Students create with internationally noted artists

Artists Anne Samat and Yanira Collado spent two weeks on the Blacksburg campus in March, working with students to make new works specifically for the Moss Arts Center galleries.

**Sock the vote**  
**AUG. 8-17**

# HEEL TO TOE

MEET THE DESIGNERS BEHIND THIS YEAR'S HOKIE SOCKS!

## ATHLETIC SOCK OPTIONS



DESIGNED BY HOKIES FOR HOKIES, Hokie socks show off student creativity and Hokie pride. Each year, we ask Hokies across the world to choose their favorite designs—created by current students—to be released later as special, limited-edition Hokie gear given to thank Virginia Tech supporters.

Get ready, because it's almost time to choose your favorite again and this year's socks are the best yet! Plus, there's even a new athletic style sock.

Since 2019, socks have been delivered as a thank you to Hokies who give to Virginia Tech during Giving Tuesday in November. Each year, the number of Hokies who have stepped up to support Virginia Tech has grown.

## DRESS SOCK OPTIONS



Virginia Tech fashion merchandising and design students create the designs, and this year's call on experiences from Blacksburg that all Hokies share.

"Everyone has their own story as to why they came to Virginia Tech, what it means to be a Hokie, and their experiences," said Whitney Jackim, one of this year's designers.

Jackim's design takes inspiration from the journeys all Hokies have at Virginia Tech, which start at the heart of our university—the Drillfield. Jackim's design uses Hokie tracks and orange and maroon diamonds that are sure to set any Hokie on the right path.

Madison Gunnell's design highlights another Virginia Tech icon, Burruss Hall, and the mountains that frame campus.

"I wanted to do something new," Gunnell said, "so I combined them."

Gunnell's socks show the outline of Burruss with orange and maroon mountains in the background, evoking the sense of home Hokies know and love.

Pilar Arrendell's simple and fun polka dot design is a more playful take on Hokie Spirit.

"My design represents Virginia Tech and what Hokie Spirit means to me. It's going to sports games, wearing Virginia Tech gear, and being involved," said Arrendell.

Hannah Finnell's design offers a different perspective on Hokie Spirit by bringing us to game days in Lane Stadium.

"Nothing shows the Virginia Tech community like everyone coming together on game day," Finnell said.

Finnell's socks capture the "Hokie Effect" by stacking orange, maroon, and black boxes to create an illusion.

With designs like these, choosing a favorite will be tough. Hokies everywhere are invited to select their top sock Aug. 8-17 at [give.vt.edu/hokiestyle](http://give.vt.edu/hokiestyle). Then Oct. 23-Nov. 17, you can make a gift supporting the area of the university that means most to you and snag your favorite socks. ■ DL

**Which design is  
your favorite?**





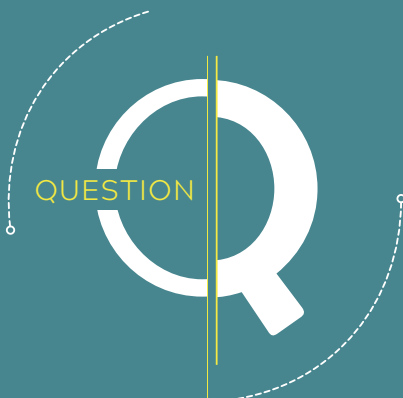
# COMMENCEMENT

THOUSANDS OF HOKIES JOINED THE alumni ranks this spring at the university's 152nd commencement. Ceremonies were held in Blacksburg, Roanoke, and the greater Washington, D.C., metro area to celebrate the Class of 2023. ■



## CLASS OF 2023 BY THE NUMBERS

- 5,549** BACHELOR'S DEGREES AWARDED
- 11** CULTURAL ACHIEVEMENT CEREMONIES
- 16** COMMENCEMENT CEREMONIES
- 1,177** STUDENTS WHO PARTICIPATED IN THE GRADUATE SCHOOL CEREMONIES
- 120** DOCTORS OF VETERINARY MEDICINE AWARDED
- 40** VIRGINIA TECH CARILION SCHOOL OF MEDICINE GRADUATES
- 255** VIRGINIA TECH CORPS OF CADETS GRADUATES
- 169** CADETS COMMISSIONED AS MILITARY OFFICERS



## WHEN IT COMES TO PLANT-BASED ALTERNATIVES TO DAIRY MILK, WHY DO LABELS MATTER?



WHEN THE U.S. FOOD AND DRUG Administration (FDA) released new guidelines earlier this year to help consumers better understand the nutritional differences between plant-based and dairy milks, Virginia Tech food science expert Melissa Wright weighed in on the decision.

According to Wright, some people believe plant-based and dairy milks are nutritionally similar, but that is not the case.

“It’s important for consumers to educate themselves about what food labels tell us about what we are putting into our bodies. The largest nutritional differences are with protein and carbohydrates,” Wright said. “While plant-based beverages might contain as much protein as dairy milk, the key piece of informa-

tion that consumers don’t always know is that not all protein is equal when it comes to human digestion.”

All sources of protein have a protein digestibility-corrected amino acid, or PDCAAS, score. This score evaluates the quality of a protein based on the amino acid requirements for humans and their ability to digest it.

“The major components making up carbohydrates in plant-based milks are fiber and sugar. Dairy milks have no fiber, so all of the carbohydrates come from sugars. The key takeaway here is that almost 100 percent of the sugar in plant-based beverages are added sugars,” Wright said.

The FDA’s decision to add to the nutrition facts panel makes a distinction between natural sugars, like the lactose in milk, and added sugars, like the cane sugar added to sweetened plant-based milks. Milk sugar—lactose—provides a nutritional benefit to humans that cane sugar does not, Wright said.

Most of the plant-based milk options—oat, almond, rice, coconut, hemp, cashew, hazelnut, soy, pea, flaxseed, and sesame—have similar nutrition profiles, Wright said. “Coconut can have more fat than others. Soy has more protein than the rest. Sodium content is very con-

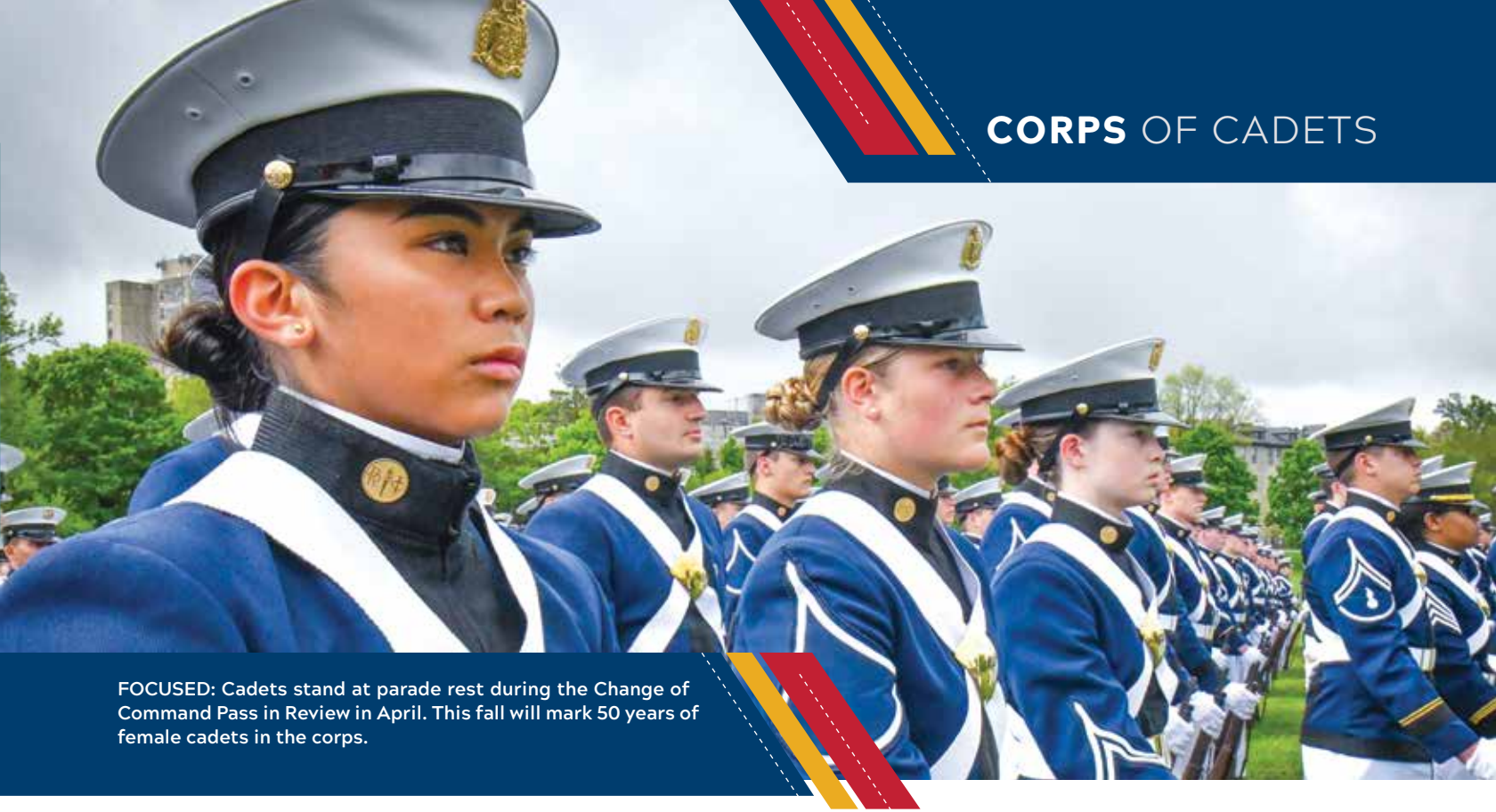
sistent among all. Oat and hazelnut can have more sugars. Oat can have more calories than some.

“When you look at the list of sources, it’s important to remember that there are many potential allergens represented, including tree nuts, soy, and sesame,” Wright said. “Many consumers leave dairy milk because of lactose intolerance but may find that they are sensitive to the proteins in plant-based products as well. Reading and understanding labels is important for that reason.”

Wright is director of the Food Producer Technical Assistant Network at Virginia Tech. Part of the Virginia Cooperative Extension network in the Department of Food Science and Technology under the College of Agriculture and Life Sciences, the program helps food entrepreneurs and businesses bring their products to market.” ■ MKA



Melissa Wright



**FOCUSED:** Cadets stand at parade rest during the Change of Command Pass in Review in April. This fall will mark 50 years of female cadets in the corps.

# CONTEMPLATING THE FUTURE

**THIS FALL, THE VIRGINIA TECH CORPS** of Cadets will open two new buildings, completing the renaissance of the Upper Quad.

The Corps Leadership and Military Science Building will house corps programs, classrooms, and a museum as well as the university's ROTC programs and the Integrated Security, Education, and Research Center. Additionally, a new residence hall will house cadets in the 4th Battalion and bring the total capacity of the corps to 1,400 cadets.

In the coming months, the corps also will be celebrating 50 years of women as an integral part of the cadet regiment. The Virginia Tech Corps of Cadets admitted women before any other senior military college or federal service academy. These women, along with all those who

have followed, illustrate that global, ethical leadership is a calling for all.

While these occasions will be celebrated at Corps Reunion this year, there is no time to rest. Recruiting is an ongoing effort. Each year, Virginia Tech competes against the five other senior military colleges and their financial aid packages in an effort to enroll strong cadet classes.

This year's incoming class numbers look promising, but the cost of education, tuition, fees, room, and board continue to rise. It is becoming less uncommon for these cadets to struggle to overcome financial challenges that result from growing costs and increasing debt. More than a few of them face leaving the corps and the university as a result.

Virginia Tech President Tim Sands has launched the Virginia Tech Advan-

tage, an initiative to dramatically improve the university's access and affordability for Virginia students, including cadets. The initiative seeks to ensure that the Virginia Tech experience is financially within reach for everyone, regardless of income.

So the work continues, not just for the alumni and friends of the corps, but all those whose lives are protected by and benefit from Hokies who choose a path of *Ut Prosim* (That I May Serve) in and out of uniform. ■

*Maj. Gen. Randal Fullhart is the commandant of cadets.*



## BUGLE CALL

Stay up-to-date about the latest news and happening from the Virginia Tech Corps of Cadets, visit [vtcc.vt.edu](http://vtcc.vt.edu).

## MOMENT

Sweta Baniya

# THIS ISN'T JUST ANY NECKLACE

“

WE TEACH CRITICAL THINKING. WE TEACH HOW TO ASK QUESTIONS. WE TEACH UNCOMFORTABLE QUESTIONS TO ASK ABOUT JUSTICE AND ISSUES.”

Sweta Baniya  
assistant professor



**ALARMING:** Sweta Baniya, an assistant professor of rhetoric, professional, and technical writing at Virginia Tech and a native of Nepal, voiced concerns about a Nepali necklace on display at the Art Institute of Chicago. Her actions led to an international investigation. She visited the Art Institute of Chicago in December 2021 to make a plea for the necklace's return to Nepal.

FRIENDS KEPT TELLING SWETA BANIYA about the Nepali artifacts on display at the Art Institute of Chicago. Baniya, assistant professor of rhetoric, professional, and technical writing in the College of Liberal Arts and Human Sciences and a native of Nepal, longed to see them for herself.

One item—a 400-year-old necklace made of gilt copper and stones—was of particular interest.

But on June 12, 2021, what Baniya saw and posted about during her visit to the institute sounded an international alarm, placing her in the middle of an art investigation that still is making headlines.

Although Baniya said she did not initially think that the necklace was a stolen piece of art, she was uncomfortable with how it was displayed.

“I felt like it shouldn't be here. It's sacred and it's very famous in Nepal,” she said.

Baniya took photos and a video of the necklace in its exhibit case, posting them to social media. By the next morning, her Twitter account was blowing up. Journalists in the United States and in Nepal began contacting her as news of the necklace gained traction.

In March, ProPublica, an independent nonprofit newsroom, along with Crain's Chicago Business Journal, co-published

an investigative account of items donated to the institute by the late Marilyn Alsdorf, a benefactor. According to the story, Nepali activists—and government officials, in one case—have requested the return of certain items Alsdorf donated, noting there is evidence the pieces may have been looted and sold on the art market.

One of the primary items under investigation, the necklace, from the Taleju Temple in Kathmandu, is believed to belong to Taleju Bhavani, a patron goddess known as the chief protective deity of Nepal and its royal family.

In December 2021, Baniya again visited the institute, where she publicly advocated for the necklace's return. To date, the necklace remains in Chicago. The institute's public affairs office did not respond to requests for comment about its future.

The investigation and her advocacy model concepts from her teaching continue.

“We teach critical thinking,” Baniya said. “We teach how to ask questions. We teach uncomfortable questions to ask about justice and issues.”

Learn more at [news.vt.edu/magazine](https://news.vt.edu/magazine). ■

*Jenny Boone is the director of communications and marketing for the College of Liberal Arts and Human Sciences.*

# GAME, SET, HISTORY

**ONE OF THE ONLY ADAPTIVE ATHLETICS** teams at Virginia Tech, the wheelchair tennis team is just beginning what hopefully will result in a lasting impact on the university.

In 2020, Virginia Tech Recreational Sports partnered with the Virginia Tech varsity men's tennis team to offer the university's first ever wheelchair clinic. Since then, the men's team has hosted weekly wheelchair tennis clinics, with the student-athletes volunteering to lead instruction for adaptive athletes.

The effort led to the formation of a club sports team, and the clinics serve as a practice for the club team and anyone else who wants to join.

Frank Thompson, a rising senior on the men's tennis team, started the clinics and has been a part of them ever since.

"The clinics started as my eighth-grade community service project," Thompson said. "I started working with a child named Parker when he was around 4, and the clinics just slowly grew from there. Every year, we have added one or two more people, and now we are an actual team of seven people."

Gaila Fosbinder, a rising sophomore majoring in engineering, is one of two students on the wheelchair tennis team.

Fosbinder developed a passion for tennis at the age of 8, and she learned to play standing. But arthrogryposis multiplex congenita, a condition that affects the joints, transitioned Fosbinder into playing wheelchair tennis three years ago.

Jason Harnett, the United States Tennis Association wheelchair tennis head coach, recruited her to come to Virginia Tech after the university received a grant from the association to grow the program.

"Even though it looks different, all the rules are the same except that we get double bounce," meaning the ball can hit the ground two times during play, Fosbinder said. "Able-bodied people can easily play with people in chairs, so it's a great sport to integrate both types of people, and I don't think it is thought of in that way."

Looking ahead, what does the future look like for the clinics?

"The biggest thing is seeing more clinics more frequently," Fosbinder said. "The Alabama [University of Alabama] team is one of the biggest teams in the United States, and they have won the champi-

onship for six years in a row. I am looking toward a future where we could get to that point."

The Virginia Tech team attended the Collegiate Wheelchair Tennis Championships—its first national showing—held April in Orlando, Florida.

Fosbinder said her goal during her next three years at Virginia Tech is to expand adaptive athletics beyond tennis.

"I hope we can expand to wheelchair basketball or wheelchair track and field because it will draw more diversity into the university," she said. "Right now, there aren't many disabled people on campus, and with Virginia Tech's motto being *Ut Prosim* [That I May Serve], it would blend really well into having adaptive athletics."

■ CM



CLINIC ON THE COURT: Virginia Tech Tennis hosts the weekly wheelchair tennis clinic at the Burrows-Burleson Tennis Center.

OLOGY

a subject  
of study

ol·o·gy  
äləjē

## THE SCIENCE BEHIND THE 'BRAIN FREEZE'

**SUMMER BRINGS FUN ACTIVITIES** such as picnics, outdoor barbecues, and poolside lounging, but the season also ushers in not-so-pleasant experiences such as ants, mosquitos, and sunburns. Even sweet, cooling treats such as ice cream and slushies can deliver an unpleasant surprise—the dreaded “brain freeze.”

Virginia Tech neuroscientist Kristofer Rau, assistant professor in the Virginia Tech Carilion School of Medicine’s Department of Basic Science Education, has expertise in molecular biology, electrophysiology, and behavior assessments and explained the science beyond these quick-onset headaches. Also, he shared some suggestions about how to avoid them—or at least make them go away faster.

“One important function of your brain is to make sure that certain areas of your body remain in specific temperature ranges. Your head is particularly important, so the normal response to a cold stimulus inside the head is to try to warm that area back up. It does this by rapidly increasing the flow of warm blood through the blood vessels in the roof of your mouth. This sudden expansion of blood vessels is sensed by nerve cells, but unfortunately the brain interprets the rapid expansion as something that is painful,” Rau said.

“The suddenness of the expansion in the blood vessels causes a burst of activity in the nerve endings in the roof of your mouth, and that intensity is interpreted by the brain as something that we really need to pay attention to and do something about immediately. Most of the regular headaches that we get are also caused by changes in the size of our blood vessels that are similarly detected by nerve endings, but these are more gradual changes.”

Although brain freeze is “highly unpleasant” and can affect anyone, the nerve reaction is not harmful and should go away within a few seconds to a minute, Rau said. He also offered a few simple suggestions to help control the pain.

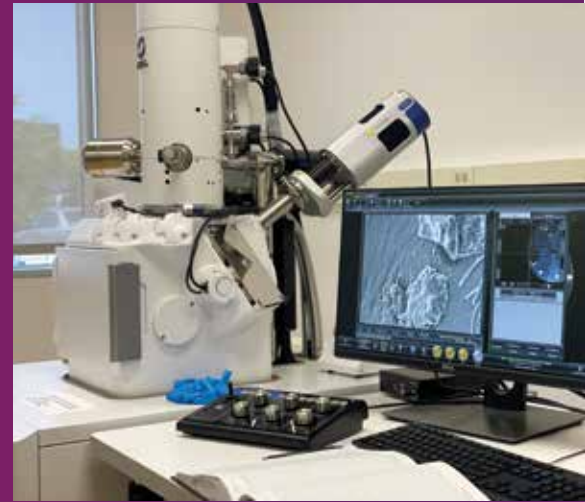
- At the onset of the headache, drink something that is room temperature or push your tongue against the roof of your mouth to quickly warm the area back up.
- Eat or drink cold items more slowly, to give your body time to adjust.

“The only way to completely prevent having one altogether is to avoid consuming anything that is cold. Summer without ice cream and popsicles seems quite sad, though, so it is probably worth the risk of the occasional brain freeze,” said Rau. ■ MA



Kristofer Rau

**COLD FACTS:** Kristofer Rau, assistant professor, explains when it comes to ice cream headaches, that the short-term pain is not harmful.



**THERE ARE HIDDEN WORLDS** ALL around us that are too small to see with human eyes. Electron microscopes offer researchers a window into these microcosms. There are two primary types of electron microscopes: the transmission electron microscope (TEM) and the scanning electron microscope (SEM).

The Virginia Tech Magazine cover image features a magnified view of a tiny particle from a tire. The particle was collected by students who filtered water samples from Stroubles Creek.

The cover image and related art for the microplastics story on page 28 were taken using the SEM. Virginia Tech Magazine teamed up with Austin Gray from the College of Science and technical experts through NanoEarth at the Nanoscale Characterization and Fabrication Laboratory to create the featured images.

NanoEarth is one of the 16 sites that make up the National Science Founda-

tion-funded National Nanotechnology Coordinated Infrastructure. The center supports researchers across academia, government, and industry and provides the tools and expertise to guide nanotechnology research and propel environmental solutions.

Established in 2007, the lab is an initiative of the Institute for Critical Technology and Applied Science and is located at the Virginia Tech Corporate Research Center. The facility is equipped with more than \$10 million in highly specialized equipment, such as the SEM. The Commonwealth Research Initiative provided more than half of the funding for the lab's equipment.

### HOW ARE SAMPLES PREPARED?

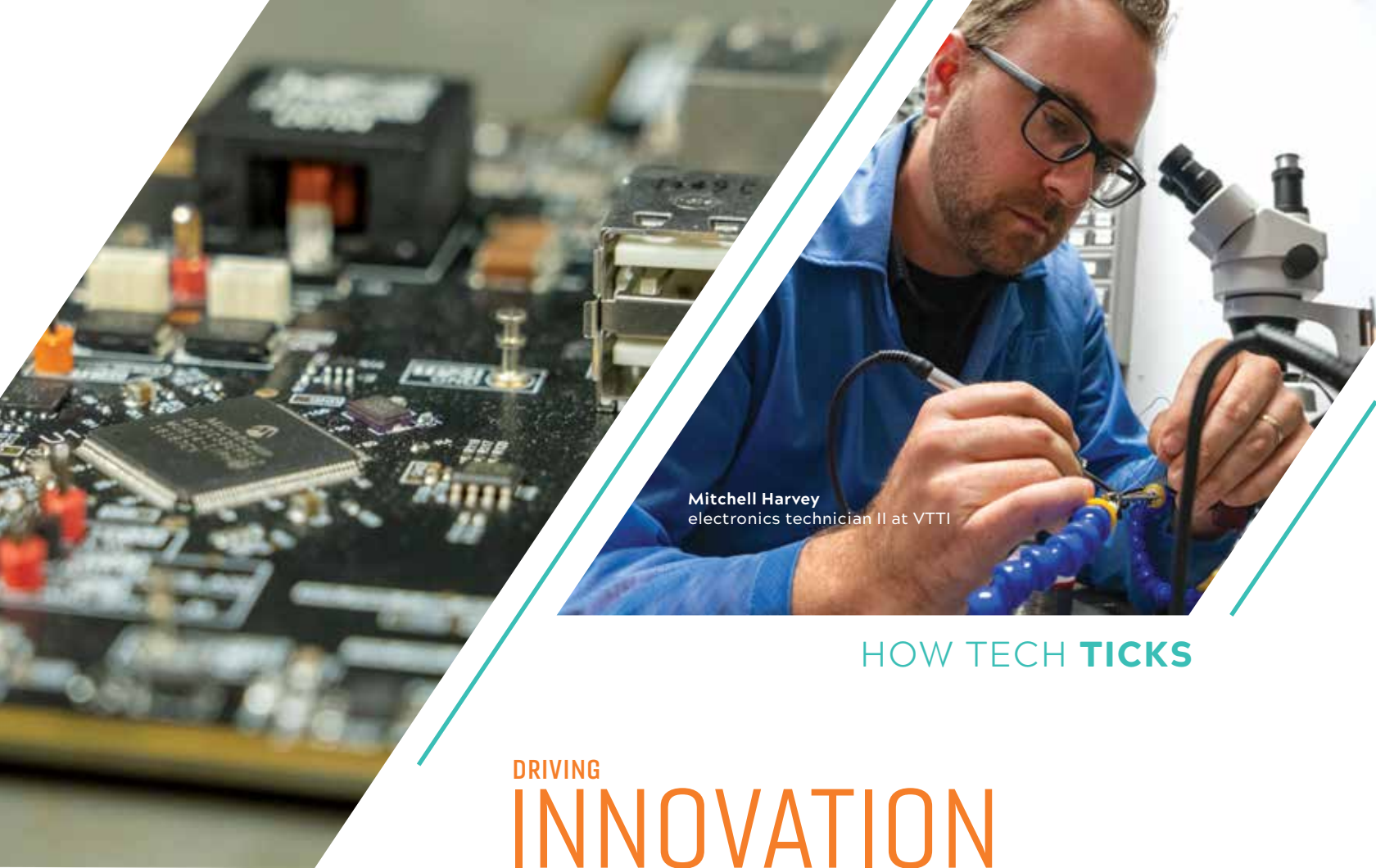
Because the SEM uses electrons to produce an image, most require that the samples being viewed are electrically conductive. All metals are conductive and

require no preparation to be viewed using the SEM. In order to view nonconductive particles such as ceramics or plastics, the sample or samples must be coated with a thin layer of a conductive material.

### WHAT ARE THE USES OF THE SEM?

SEMs provide a 3D image of the surface of a sample and offer information about that surface such as its roughness or possible contaminants. Researchers can use these images to inform future studies and to develop hypotheses about very small particles and their potential effects on the environment and even the human body. ■ *ES*

**FIELD OF VISION:** Weinan Leng, director of the Virginia Tech Center for Sustainable Nanotechnology Laboratory, is NanoEarth's lead instrument specialist. Leng prepared the samples and operated the SEM to collect the images for the cover and story.



Mitchell Harvey  
electronics technician II at VTTI

## HOW TECH TICKS

# DRIVING INNOVATION

**IN THE EARLY 1990S, TOM DINGUS** had an idea that would bridge the gap between transportation research and real-world driving by moving studies from the lab onto the open road. That idea resulted in the development of methods that are now used around the globe to inform research that saves lives, time, and money and protects the environment.

Dingus, who served as director of the Virginia Tech Transportation Institute (VTTI) for more than 20 years, and his team pioneered the VTTI data acquisition systems, which unobtrusively places multiple cameras and sensors in a volunteer's vehicle to record driver behavior, crashes, and other driving incidents. From "key on to key off," a continuous stream of data is time synchronized, captured, transferred, stored at Virginia Tech, and ultimately

used to improve the transportation system for everyone who uses the roads.

Over the past 35 years, naturalistic driving study data has been collected from nearly 7,000 vehicles, including cars, tractor-trailers, bicycles, and e-scooters. It would take about 1,030 years to watch all the video.

The technical report from VTTI's first large-scale naturalistic driving study, the seminal "100-car study," received more than 15,000 citations and has allowed researchers to make data-driven recommendations to both policymakers and tech developers.

The early success of this VTTI innovation has led to the widespread use of naturalistic driving studies to solve transportation problems across the globe.

In the beginning, the data acquisition system filled a large portion of the vehicle's trunk, took multiple people days to install, and recorded video onto VHS tape and later onto Hi8 tape.

Today, the talented engineering team at VTTI creates technology ranging from units the size of a smartphone that can be installed in minutes to powerful systems boasting numerous 4K HD video streams and an advanced network of sensors such as LiDAR, radar, and GPS that provide researchers a clear picture of what happens across various driving conditions. For example, researchers can review video and sensor data collected immediately before a crash to see if driver distraction or some other issue contributed to the incident. ■

*Jacob Levin is the communications specialist for the Virginia Tech Transportation Institute.*





#### < WELL CONNECTED

VTTI's DAS connects to multiple vehicle communication networks to record data from the vehicle's factory sensors, controls, and interfaces.

#### ✓ SAY "CHEESE"

Cameras are placed around the vehicle to capture detailed scene information both within and outside the vehicle from 'key-on to key-off'.



### VTTI'S NATURALISTIC DRIVING STUDIES HAVE:

- Provided foundational knowledge to inform distracted driving and cellphone policies.
- Influenced hours of service regulations that limit the amount of time truck drivers can be behind the wheel, increasing commercial driver safety.
- Greatly improved the understanding of why crashes occur, with the findings published in journals such as the New England Journal of Medicine, Proceedings of the National Academy of Sciences of the United States of America, and the National Institutes of Health's National Library of Medicine.
- Established a critical data resource for the development and testing of advanced vehicle technologies, from next generation driver interfaces to automated vehicles.

#### ^ AT THE PUSH OF A BUTTON

Often, an interface is placed at the bottom of the windshield on the driver's side, allowing the participant to flag events of interest and communicate with research team.



### ON THE ROAD AGAIN

Learn more about the Virginia Tech Transportation Institute at [vtti.vt.edu](http://vtti.vt.edu).



## 6 THINGS

# ABOUT TICKS

“

YOUR BODY CANNOT SENSE IT'S BEING PIERCED, YOU DON'T FEEL THEM AT ALL, AND THEY'RE EXTREMELY HARD TO REMOVE. **TOGETHER, THOSE FEATURES CREATE A BIG PROBLEM. THEY'RE LITTLE BEASTS.**”

Brandon Jutras  
professor

**BRANDON JUTRAS KNOWS A LOT** about the horrors of ticks.

Since joining Virginia Tech in 2018, Jutras and the Jutras Lab have made numerous breakthroughs related to Lyme disease and have been awarded nearly \$10 million in research funding.

Most recently, Jutras received a \$1.2 million grant from the Department of Defense to create an acute test for the disease and a National Institutes of Health R01 grant of just more than \$2 million to investigate the lingering impacts of the disease in some people.

As a person who enjoys the outdoors and the owner of two dogs—a black Labrador retriever mix, Fiona, and a golden retriever, Fred—Jutras is no stranger to ticks outside of work hours.

In the region, blacklegged ticks, commonly called deer ticks, are the only ones able to transmit the bacteria that causes Lyme disease, and they can only do so as nymphs or as adults. Nymphs are about the size of a pencil tip.

Unlike mosquitoes, some ticks don't seek hosts as much as they simply sense carbon dioxide expelled by other organisms during breathing. They then crawl to the highest possible point, reach out their Velcro-like arms, and hopefully cling on. They also secrete antihistamines, along with a glue-like material called cementin, when they latch onto a person or animal, Jutras said.

“So your body cannot sense it's being pierced, you don't feel them at all, and they're extremely hard to remove. Together, those features create a big problem,” Jutras said. “They're little beasts.” ■

*Travis Williams is the writer/editor for the Office of Research and Innovation.*



# > tick tips

JUTRAS SUGGESTED A HANDFUL OF TIPS TO AVOID THE HORRORS OF THESE BEASTS:

one

## CHECK OFTEN AND ALWAYS

“The prompt removal is the most important thing,” Jutras said. “Once the tick bites, it can take anywhere from 12 to 72 hours to transmit the Lyme disease-causing bacterium. They like to hang out in inconspicuous areas. They like warm and moist environments, so you can imagine where those might be. If you’re outside in a high-risk area, such as anywhere with high grass, a wooded property, golf course, etc., a good way to check is to have a good shower afterward.”

two

## LIGHTEN UP

“Wear light-colored clothing while enjoying the outdoors and treat these clothes with DEET, or N,N-diethyl-meta-toluamide, containing bug spray. This does work well at repelling ticks, and light-colored clothing will allow you to spot the ticks more easily. When in high-risk areas, check yourself often. Initial tick contact almost always occurs below your thigh.”

three

## PROTECT YOUR PETS

“Our furry friends are wonderful companions, but they are tick magnets. Commercial tick treatments do not prevent attachment, and will usually kill the ticks if they do start feeding, but they do not prevent contact. What happens? Often, the ticks are brought inside from the outdoors by our pets and they are then able to bite us. Another important mitigation strategy is vaccination. The Lyme disease vaccine works well for companion animals”

four

## DON'T SKIP THE DRYER

“Spring and summer weather encourages many people to hang their clothes to dry. However, ticks survive the washer and can remain on clean clothes. They do not, however, survive the dryer. If you have returned from a high-risk activity, like hiking or camping, be sure to use the dryer on all articles of clothing.”

five

## REMOVE DEBRIS

“Ticks hide and over-winter in moist, insulated environments, like leaf litter. Removing large accumulations of debris can help curtail tick populations on your property. Annual insecticide applications to property boundaries is another relatively effective strategy.”

six

## SIX-LEGS, DON'T PANIC

“Blacklegged ticks are not born with the Lyme disease bacterium. They acquire it by feeding on infected animals. So the earliest life stage—larvae—are not carriers and are unable to transmit the disease. A unique feature of this life stage is that they only have six legs while potential carriers (nymphs and adults) have eight legs. As such, Lyme disease is not a concern if you remove a feeding tick that has six legs.”

# PLASTIC

## THE GOOD, THE BAD, AND THE UGLY

Originally marketed as a product with 1,000 uses, plastic is a part of life in the United States. Yet, there are downsides to the prolific use of this relatively cost-effective, durable material. That's why the United Nations\* and other global organizations are working to create awareness about plastic, plastic pollution, and simple steps that most families can take to reduce plastic waste.

1

Half of all plastic produced is designed to be used just once and then thrown away.



4

Around the world, 1 million plastic bottles are purchased every minute.



3

Humans discard about 400 million tons of plastic waste globally every year.

2

5 trillion plastic bags are used worldwide every year.



5

Marine and coastal species are affected by plastic pollution through ingestion, entanglement, and other dangers.



6

Cigarette butts—whose filters contain tiny plastic fibers—are the most common type of plastic waste found in the environment. Food wrappers, bottles, bottle caps, grocery bags, straws, and stirrers are the next most common items.

8

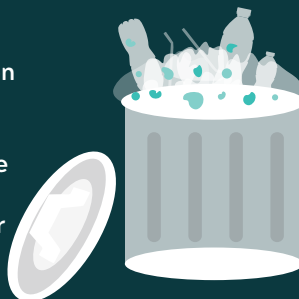
Researchers believe that there will be more plastic than fish in our oceans by 2050.

7

The Great Pacific Garbage Patch is a collection of debris in the Pacific Ocean. It spans an estimated area of nearly 620,000 square miles, which is three times bigger than France or about twice the size of Texas. Also known as the Pacific Trash Vortex, it's getting bigger as more trash floating in the ocean joins it.

9

Rivers carry plastic waste from deep inland to the sea. An estimated 19 million to 23 million metric tons end up in lakes, rivers, and seas annually.



## HISTORY OF PLASTIC

# 1907

Plastic was invented in 1907 by Leo Baekeland. His product, Bakelite, was the first fully synthetic plastic.

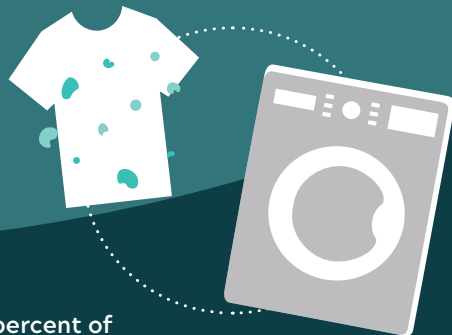
# 1950

Chemical improvements led to the mass production of plastic by about 1950.

# 2017

More than 18.2 trillion pounds of plastic has been produced worldwide since the 1950s. That's equivalent to 1 billion elephants or 25,000 Empire State Buildings.

- 10** Microplastics from textiles are called microfibers because of their shape. Check the labels of clothing or other fabric products. Words such as “polyester,” nylon, polyamide, and acrylic are examples of plastic materials. When these textiles are manufactured, washed with your laundry, worn, or dried, they release plastic fibers in the water and the air.



- 11** Less than 10 percent of plastic produced is recycled.

*\*World Environment Day, which has been recognized annually on June 5 since 1973, is the United Nations' day for encouraging worldwide awareness and action to protect our environment. In 2023, the event focused on awareness of plastic pollution. Many of the statistics on this page were curated from materials connected to the event.*

## HOW YOU CAN HELP

- **CLEAN** a beach or waterway.
- **SHOP SUSTAINABLY.** Choose food without plastic packaging. Carry a reusable bag.
- **TRAVEL SUSTAINABLY.** Try to curb your single-use plastic intake. Use reef-safe sunscreen without microplastics.
- **TRY A ZERO-WASTE LIFESTYLE.** Invest in sustainable, environmentally friendly products such as reusable coffee mugs, water bottles, and food wraps.
- **BE AN ADVOCATE FOR CHANGE.** Ask your local supermarkets, restaurants, and suppliers to ditch plastic packaging. Refuse plastic cutlery and straws, and tell people why.
- **ENCOURAGE** local authorities to improve how they manage waste.
- **DRESS SUSTAINABLY.** Consider sustainable clothing lines. Try vintage shops, and repair your clothes when possible.
- **CHOOSE PLASTIC-FREE** personal care products. Look for plastic-free face lotions, makeup, and deodorant.



A scanning electron micrograph (SEM) showing a highly textured, fibrous, and irregularly shaped microplastic particle. The particle has a complex, porous structure with many fine fibers and protrusions. The background is dark and out of focus, showing other similar particles.

📷 x1,000

ZOOMING IN + ON

micro**plastics**

By Erica Stacy with Max Esterhuizen, David Fleming, Suzanne Irby,  
Steven Mackay, Suzanne Miller, Courtney Sakry, and Chelsea Seeber

We use plastic in almost everything from the clothes we wear to the furniture in our homes to the tires on the cars we drive. Plastics even are used in personal care products such as toothpaste and shampoo. And as we work and play and perform everyday tasks like laundry, fibers from these plastics shed and spread, traveling by air, land, and water.

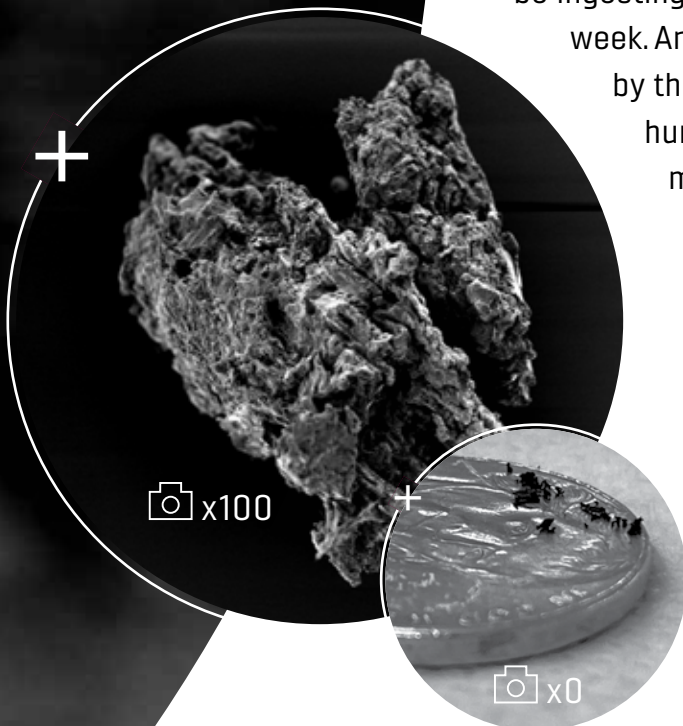
Scientists have long believed that plastics may never fully biodegrade. They simply break down over time into smaller and smaller pieces.

Tiny plastic particles that measure 5 millimeters or smaller, or about the size of a sesame seed, are called microplastics. Even smaller plastics measuring at a single micrometer—many times smaller than the width of a single human hair—are called nano plastics. These tiny plastics are everywhere. They've been found in remote places from the summit of Mount Everest, deep in arctic ice, within the bodies of land and sea animals, and in the lungs, organs, and feces of adults and infants.

In March 2022, research published in *Environmental International* identified nano plastics in the blood of healthy adults. Further analysis traced the particles to the plastics most commonly used in beverage bottles, food containers, and shopping bags. Some environmental scientists suggest that the average person may be ingesting and inhaling the plastic mass of a credit card every week. And although most of the particles are likely filtered out by the body's waste systems, microplastics pose a risk to humans physically, chemically, and as a host for other microorganisms to gather and breed.

What happens as these tiny particles deteriorate and move around the world? How will they affect our health and the health of other living creatures? What changes can we make to reuse and repurpose plastics more effectively?

These questions are at the core of emerging fields of study for researchers, including many at Virginia Tech.



## full circle

What will it take to move from a traditional throwaway economy into one where waste is eliminated, resources are circulated, and nature is regenerated?

These are the questions that Jennifer Russell, assistant professor in the Department of Sustainable Biomaterials within the College of Natural Resources and Environment, thinks about every day.

“I believe that figuring out how to live sustainably—in cooperation with others, with nature, and with natural systems—is the hardest and most important challenge that human beings have faced,” said Russell. “I teach in this field because I know humans are capable of being better, and I want to help students to explore the ways in which they can personally contribute to this critical transformation of society.”

Russell, who is also affiliated with the Virginia Tech Global Change Center, works in the area of circular economy, an economic model that aims to reduce or eliminate waste and promote the continuous use of resources, as well as create new economic benefits, such as job creation and cost savings.

By contrast, the industrialized society that supports most humans today operates within a linear economy, also known as a take-make-waste model, in which resources are extracted, used, and then discarded. This model has led to environmental problems, such as pollution and resource depletion, as well as economic inefficiencies.

“By ascribing to the principles of circular economics, businesses and industries can diversify their practices and rethink their business models,” Russell said. “At its core, a circular economy is less transactional, offering businesses and brands opportunities to innovate within their revenue and product-ownership models in ways that allow them to focus on longer-term relationships with clients.”

According to Russell, the automobile industry’s efforts to lease vehicles is an example of how this might work. Consumers lease a vehicle that will serve their needs, then it is returned to a dealer who can make needed repairs and either resell that car or truck or reclaim and repurpose components from the vehicle for future use. Russell believes that model could be replicated for other industries and products like appliances or electronics.

Russell uses computational modeling to demonstrate how efforts to reuse, repair, refurbish, re-manufacture, and recycle

can generate economic benefits for businesses and individuals and support the environment. She also incorporates details connected to how human behavior, perceptions of value, and decision-making may affect sustainability outcomes.

Plastic, in the form of polyurethane foam, is at the center of one project that Russell is supporting through a collaboration with Timothy Long, affiliated professor in Virginia Tech’s Department of Chemistry and director of the Biodesign Institute at Arizona State University. It began with a conversation about foam mattresses.

“I was talking with a Virginia Tech alum who worked for a polyurethane foams mattress company,” said Long. “He explained to me that foam mattress production is growing at an enormous rate, and that we recycle none of them. I immediately thought this would be an opportunity to make a difference. Big challenges equal big impacts.”

Polyurethane foam, a cushioning agent, is used in products from office chairs to mattresses and sneakers. But that comfort comes at a cost: the foams—made from petrochemicals with an open cellular structure that holds pockets of air—are incredibly difficult to recycle.

In 2021, the College of Natural Resources and Environment, in collaboration with Arizona State University and the Adidas AG corporation, received a four-year \$1.8 million grant from the National Science Foundation to study polyurethane foams, led by Long.

The Arizona State team is focused on advanced recycling technologies, while the Virginia Tech team, which includes Russell, is mapping the presence and flows of the foams in the U.S. market and engaging with stakeholders to develop viable systems and infrastructure to recover, recycle, and redistribute these materials as part of a circular economy.

The industry partner for the study is Adidas, which has a stake in improving the utilization of polyurethane products that it uses to manufacture athletic gear and apparel.

Working with the largest shoe company in Europe offers the opportunity to affect real-world change, according to Russell.

“The value of having Adidas involved is that they provide a practical example of what a circular economy for polyurethane foams could look like,” Russell said. “This is not an academic exercise.



This research will lead to solutions that are designed, from the start, to be integrated into commercial business processes.”

Russell stressed that polyurethane foams, like all plastic materials, have been an important building block for decades of innovation. Better recovery and reuse of such materials means that we can continue to rely on them in the future.

“We need to reframe what we see as waste and what we understand to be valuable,” she said. “Plastics are incredibly valuable, but they can also cause great damage to the environment and human health if we don’t manage them properly. This project is about creating systems and technology that will allow us to continue to utilize these materials responsibly and effectively.”

## under the sea

For thousands of years, people have used the oceans to move products, for travel, as a source for food and other resources, and for fun activities such as swimming, diving, and surfing.

Unfortunately, the oceans also have become dumping grounds—adversely affecting marine animals and plants. As human reliance on plastics for everything from clothing material to tires continues to increase, some researchers suggest that by 2050 plastic waste will outnumber fish in ocean waters around the globe.

What does that mean for the health of marine life? Do plastic particles contribute to climate change? Are microplastics offering a new transportation system for opportunistic parasites or viruses? How are microplastics affecting the fertility of sea creatures, and what effect does that have on the marine ecosystem?

According to one expert at Virginia Tech, the questions far outnumber the answers in part because scientists’ knowledge about the oceanic environment is limited.

“We have better maps of Mars than the bottom of our own oceans,” said Robert Weiss, director of the Academy of Integrated Science and professor of natural hazards in the College of Science. “But that’s topography on the seafloor. Imagine how little we know about how conditions are when the water in the ocean is constantly moving. How can we describe a condition in a certain area if it’s constantly changing? If the moment you measure it, it’s gone?”

+

“I BELIEVE THAT FIGURING OUT HOW TO LIVE SUSTAINABLY—IN COOPERATION WITH OTHERS, WITH NATURE, AND WITH NATURAL SYSTEMS—IS THE HARDEST AND MOST IMPORTANT CHALLENGE THAT HUMAN BEINGS HAVE FACED.”

Jennifer Russell  
assistant professor





“BY DEPLOYING A SWARM, OR TEAM OF ROBOTS THAT USE SOUND FOR COMMUNICATION, WE MAY BE ABLE TO FOLLOW THE MOVEMENT OF A WEATHER SYSTEM OR IDENTIFY AN OBSTACLE OR EVEN CREATE A THREE-DIMENSIONAL VIEW OF THE WATER COLUMN.”

Dan Stilwell  
professor



According to Weiss, to study what’s happening in the underwater world, scientists need to develop tools and refine research methods to adapt to the ocean’s transience. In 2020, Weiss, helped launch the Center for Coastal Studies at Virginia Tech. Part of the Fralin Life Sciences Institute, the center coordinates research, teaching, and outreach to ensure a sustainable connection between humans and nature within coastal communities.

“Virginia Tech is uniquely positioned to make a difference,” Weiss said. “Our comprehensive academic and research environment supports collaboration, and addressing oceanic challenges requires a broad swath of expertise.”

To collect the data needed to analyze an environment in constant motion requires tools that move with the water, collecting data as they go. One possible solution: deploying underwater robots.

Autonomous vehicles give researchers a much more dynamic method for measuring environmental conditions with the ability to move through ocean depths and with currents to follow the data. Eventually, the team can then operate those vehicles to collect microplastics concentrations and learn how they’re affected by the ocean conditions in flux around them.

A member of the Virginia Tech community since 2001, Dan Stilwell, professor of electrical engineering in the College of Engineering, is focused on marine robotics and autonomy and the design of advanced autonomous underwater vehicles (AUVs). He has led or co-led the development of multiple AUV systems, including a general-purpose system that operates up to 500 meters deep.

“We are working to design and build underwater robotic systems—robots that can work in teams to collect data,” said Stilwell, who is also the director of the Virginia Tech Center for Marine Autonomy and Robotics. “By deploying a swarm, or team of robots that use sound for communication, we may be able to follow the movement of a weather system or identify an obstacle or even create a three-dimensional view of the water column.”

But Stilwell admits that the ocean presents some unique challenges—even for robots.

“There is no Wi-Fi, none of the typical communication supports that we take for granted on land,” said Stilwell. “There is no light to allow the robots to ‘see’ where they are going. The amount of information that the robots can communicate is very low due to the nature of the environment.”

Some of the AUVs that Stilwell has helped design and build resemble torpedoes. The robots rely on battery power and can run for about 22 hours before they need to be recharged.

Stilwell's team takes advantage of Claytor Lake, just 30 minutes southwest of the Blacksburg campus, to test the AUVs in a "true to life" environment.

"Claytor Lake is an excellent testing ground for our AUVs because it's large enough and deep enough that we can perform meaningful tests," said Benjamin Biggs, an electrical and computer engineering Ph.D. candidate. "The lake is also close enough to campus that we can come grab what we need in the morning, travel there, test for several hours, and still have time to process data back in the lab if we need to. That allows us to operate far more often than would otherwise be possible."

According to Marc Michel, associate professor of geosciences and nanoscience in the College of Science, the use of AUVs equipped with effective filtration devices offer as yet untapped potential to study samples of microparticles from surface waters and at varying depths.

"Harvesting the samples from the filter collection devices secured to underwater robotics will allow us to test our hypotheses," Michel said. "Using this data, we can better understand the types of plastics that are moving within our oceans. We can examine their physical and chemical characteristics. By looking at shapes and sizes we can begin to determine whether they are vectors for contaminants and pathogens."

Plus, there are applications beyond the oceans, Michel said. "This technology may also offer insights into the treatment and management of surface water reservoirs that communities depend on as water sources."

According to Michel, learning as much as possible about the microplastics in our soil, water, and air "offers us an opportunity to do better."

"I am the father of three children who will have to deal with the choices that my generation and the generations before me have made for decades to come," Michel said. "I feel a responsibility to help inform the changes that they will ultimately implement."

Weiss agreed. Through the emerging research, he hopes to depict the results of human behavior on the environment, specifically those connected to microplastics in the ocean.

"Let's say, in the future, we have a sensor that would allow us to determine in situ, very quickly, the concentration of microplastics," said Weiss. "We can follow the value of concentrations in the ocean, and by the motion of the vehicle, we can determine how these concentrations evolve over time. So that gives us a much more comprehensive and full data set to understand how microplastics move in the ocean. What conditions, like temperature, are they dependent on?"

"We need to see how their impact grows. It's not enough to say, 'This is how many microplastics are in the ocean and this is the impact on fish and marine mammals,'" Weiss continued. "We need to create models that describe what will happen in 50 years if we do this? Or if we do that? Or if we do nothing? We need to instill science as a decision-making tool—while we still have time to make a difference."

## upstream, downstream

In a third floor lab in Derring Hall on Virginia Tech's Blacksburg campus, Austin Gray and a team of undergraduate and graduate students carefully analyze tiny particles of plastic, some not much larger than a single grain of sand. Gray, assistant professor of biological sciences in the College of Science, hopes these microplastics will help him better understand how the products people use every day may be disrupting ecosystems and affecting animal and human health.

Vintage Star Wars posters line the walls of Gray's office.

"When we zoom in on these microplastics and begin to think about each tiny particle individually, it feels a lot like exploring an unmapped universe," Gray said. "Not unlike the plots of those movies I loved growing up."

Gray, who joined Virginia Tech in 2021, also is a faculty affiliate of the Global Change Center. His research focuses on aquatic ecology and toxicology, specifically investigating the effects of contaminants such as pesticides, pharmaceuticals, and microplastics on aquatic organisms and ecosystems.

"My lab is focused on looking at emerging contaminants, and microplastics specifically are a major group we're interested in because these are found globally in drinking water, and surface

water of streams, lakes, and rivers,” said Gray. “We know that plastic doesn’t persist intact, but it does break down into smaller and smaller particles. We breathe them in and ingest them as do the wildlife. What we don’t know are the health effects over time. Do they cause physical damage, stress, or inflammation? Do they affect reproduction?”

Gray, who always had an affinity for science, landed a job washing glassware in a lab as an undergrad at The Citadel in Charleston, South Carolina. Through that role, he saw aspects of scientific study that were new to him.

“I fell in love with the field aspect of research,” Gray said. “Science isn’t one-dimensional. Research helps us make connections back to everyday life. And if we can communicate effectively, those connections can inform positive changes.”

Charleston Harbor served as the backdrop for Gray’s early inquiries into aquatic toxicity and pollution, specifically plastic pollution.

“Charleston is a hot spot,” Gray said. “The population density, the tourism, the seafood market, and the shipping industry converge at this single coastal location, offering a nexus for studies to identify changes that may be affecting plant and animal life along with the water itself.”

In 2014, a survey conducted by a team that included Gray concluded that anyone who walked along the shoreline of Charleston Harbor would encounter a piece of plastic every two steps. That experience helped Gray and several collaborators hypothesize about what might be happening in the water. Once Gray began examining samples from the harbor, the results confirmed the theory, dubbed the “sweet tea hypothesis.”

Within the samples, the research team found bits of plastic polymer from tires as well as polypropylene particles and fibers from discarded fishing lines. And then there were the foam particles from discarded cups, likely once filled with that popular Southern staple, sweet tea.

“That’s the thing about research,” Gray said. “Taking steps to answer one question often leads you to five more. And I was anxious to learn more about what happened to these plastics once they landed in the water and how that might ultimately affect the animals that inhabit the harbor.”

Animals like the bottlenose dolphin, an apex predator.

According to Gray, as apex predators, dolphins can give us a good indication of what microplastics are moving up the food chain as they are consumed by bigger and bigger fish. By the time they’re ingested by an animal at the top of the food chain, we may be able to learn how different microplastics are distributed and accumulated once they’ve reached their final consumers.

Currently, alongside collaborators at the Hollings Marine Laboratory, Gray is involved with a five-year dolphin project supported by the National Oceanic and Atmospheric Administration’s National Centers for Coastal Ocean Science. Gray and Wayne McFee, head of marine mammal assessments at the center, are leading a team in measuring and identifying microplastics extracted from the gastrointestinal tracts of deceased bottlenose dolphins found stranded in and around Charleston Harbor. What they found in their initial assessments surprised them.

In 16 dolphins studied from 2022-23, Gray’s team found an average of over 1,550 microplastic particles in each of the mammals.

“I was pretty shocked to see levels that high within an organism,” Gray said. “It leads us to start asking more detailed questions: What about these particles is influencing anything we’re seeing in regard to mortality? Are they higher depending on where the dolphin is stranded? Does abundance change throughout different seasons or years? The more data we get, the more we can do to make inferences about what we find.”

Because the study will run over a five-year period, Gray is hopeful that the team’s data will capture change over time in a way that other studies have yet to do. Studies of this kind more often provide shorter snapshots of microplastics, maybe a year at most. With this long-term data will come a sense of the impact we have on our coasts, Gray hopes.

“If you’re in an area with a lot of microplastic pollution and a lot of discarded waste, then it’s not just going to be impacting you, it’s going to be impacting organisms that live there,” he said. “Their exposure to microplastics is directly influenced by us.”

Additionally, longer studies could reveal how policies on plastic waste and release correspond to microplastics detected in organisms over the time, Gray said. For example, the United States, in 2015, enacted legislation to prohibit the manufacture or sale of products containing microbeads, tiny plastics used as abrasives often found in toothpastes and exfoliating products, which were being detected in water in increasing numbers.

Gray acknowledges that finding effective solutions for managing environmental challenges, like plastic pollution, is no simple task.

“We can’t simply propose a global ban on the use of all plastic or a recycling requirement for individuals, for example,” Gray said. “Potential solutions have to consider factors like economics and industry capacity. Nor can we simply ignore the problems and keep following the same path. Science and society must find ways to connect. That’s part of the appeal of academic spaces like Virginia Tech that encourage collaboration between disciplines. My research might inform a model proposed by an expert in circular economy or offer insights for someone in sustainable packaging.”

Not to mention the opportunity to work with students.

“The campus is a living laboratory,” Gray said. “My students have been sampling water from Stroubles Creek to evaluate the particles from the road dust that moves into the waterway via rain and related events. Experience with more holistic research projects is a pivotal educational opportunity.”

In 2015, as Gray was studying pollution on Charleston beaches, his team found some small black particles they couldn’t immediately identify.

“We learned that these little black particles were actually tire-wear particles,” said Gray. “When you think about tires, they are made of different types of components, meaning they could be butadiene, acrylamide, styrene, and these are all polymers that are used in production of tires that are actually plastics.”

“Typically a tire will lose about 30 percent of itself over its lifetime. So that means that these small black particles that are coming off are microplastics that enter different types of waterways, including what we have on campus. Because of their composition, they can absorb various types of contaminants. If these bind to the microplastics, the microplastic itself becomes a vector where, if they’re consumed by organisms, they can transfer these carcinogenic compounds through their tissues or it can cause other types of oxidative stress or mortality within different types of organisms.”

Gray is now sampling campus waterways, like Stroubles Creek, to determine if similar pollution from roadways is entering freshwater estuaries. Tyler Allen, a 2022 graduate who is now pursuing a master’s degree at Virginia Tech, was involved with the sample collection from Stroubles Creek.



“RESEARCH HELPS US MAKE CONNECTIONS BACK TO EVERYDAY LIFE. AND IF WE CAN COMMUNICATE EFFECTIVELY, THOSE CONNECTIONS CAN INFORM POSITIVE CHANGES.”

Austin Gray  
assistant professor





“POLLUTION MOVES FROM PLACE TO PLACE BY VARIOUS MEANS, INCLUDING THROUGH THE ATMOSPHERE. THIS IS AN EMERGING ISSUE. THERE’S A LOT WE ARE STILL DISCOVERING ABOUT MICROPLASTICS.”

Hosein Foroutan  
assistant professor



“Tires can have the potential to break down and create tire-wear particles that can leach and become toxic to organisms that are present within the streams,” said Allen. “And this can enter streams from the roadways through rain events and could get carried down the stream and ultimately end up in our oceans.”

Allen also is assisting with a project to identify heavy metals and microplastics in drinking water in Richmond.

“With both of these projects, what we are looking for is important for human health, especially for kids,” said Allen. “Our findings may lead to changes in quality standards or preventive measures to protect consumers.”

Gray suggested that one of the least tapped but most integral components of science is connecting with people.

“Part of what I try to pass along to my students is that they need to build awareness around their research. What happens upstream will happen downstream, what we learn from one project informs next steps, not only for science, but for individuals, industries, and even governments.

“Scientists are servants to the world, and as such, we need to constantly be asking, ‘How can we use our findings to meet people where they are and instill the desire to make changes?’”

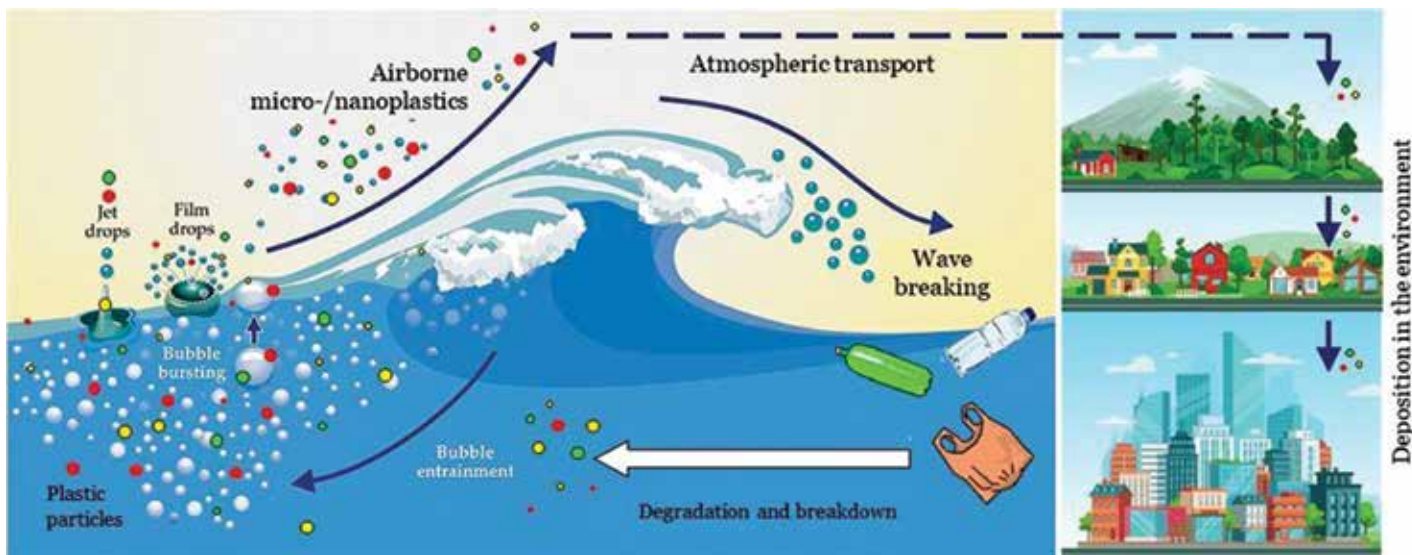
## spitting it back

When beach lovers head to the coast to play in the water, the promise of relaxation far outweighs the risks of jellyfish, riptides, or even the occasional shark sighting.

But there’s a deeper danger hidden in the waves: plastic particles.

These particles, dispersed by the same rhythmic water movement that many find so restorative, may actually contribute to a worrisome human health risk, said Hosein Foroutan, assistant professor in the Charles E. Via, Jr. Department of Civil and Environmental Engineering.

“We’ve long known that a lot of plastic waste reaches the ocean,” said Foroutan. “And many believed that’s where it stayed. But we now understand that over time plastics break up into smaller and smaller particles—particles so small that they could be car-



ried by ocean spray and transported by weather systems to just about anywhere.

“What we’ve dumped into the ocean, the ocean is spitting back.”

Microplastics and nano plastics (MNPs), tiny plastic fragments and fibers, have been found in virtually all ecosystems. According to Foroutan, these plastics can be easily ingested or inhaled by organisms, causing inflammation and damage to cells. They pose a major challenge to environmental management because they are difficult to detect, collect, and recycle.

“Microplastics are one of the most pressing environmental issues of our time,” Foroutan said. “Numerous studies have highlighted the adverse impact of microplastics on human and ecological health, with recent research reporting the presence of microplastics deep in human lungs and in blood.”

The danger of MNPs is compounded by the uncertainty surrounding their origin. Studies have detected MNPs in atmospheric samples collected in urban, suburban, and even remote areas far from obvious sources. But the question remains: How do they get there?

“There are no geographic boundaries for microplastics,” Foroutan said. “Pollution moves from place to place by various means, including through the atmosphere. This is an emerging issue. There’s a lot we are still discovering about microplastics.”

Foroutan, an affiliated faculty member of the Fralin Life Sciences Institute, the Global Change Center, and the Center of Coastal Studies, received a National Science Foundation Faculty Early Career Development (CAREER) award in 2022 to investigate air-sea interaction as a source of atmospheric MNPs.

The project expands on existing research to analyze whether MNPs are aerosolized by oceanic waves breaking and bubble bursting and how the size, shape, age, or material of the MNP particles affects aerosolization.

Foroutan hopes that in addition to assessing human risk, the experiment may shed light on the “missing plastic paradox,” which suggests that despite large amounts of plastic waste being dumped directly into the ocean or flowing toward it via rivers, only a small segment of that plastic is actually found there.

To collect the data needed to answer these questions, the team built an aerosol generation tank to reproduce the action of breaking waves and bubbly sea spray in a small-scale laboratory environment. Using controlled water samples, the scientists will simulate the bubbles and waves that naturally occur in ocean water. Any resulting aerosolized particles will be captured by filters secured in the headspace of the tank.

The scientists will analyze each particle to determine the size, density, and type of plastic. Plastic particles will also be carefully examined with consideration for whether they might be

# Seale Coastal Zone Observatory

How many microplastics are concentrated in the ocean and what are they made of? How do they move through water? And how will they affect people, wildlife, and the marine environment in the years to come?

At the Seale Coastal Zone Observatory, an initiative in Virginia Tech's Center for Coastal Studies, an interdisciplinary group of researchers including biologists, veterinary scientists, and engineers are working together to find answers.

The program, led by Robert Weiss, professor of geosciences in the College of Science, aims to model the effects of microplastics on the marine environment.

"What we want to create is a set of outcomes that help people to make decisions about their behavior, and by people, I mean individuals, governments, and society as a whole," said Weiss, the center's director. "Decisions have consequences, and sometimes those consequences are hidden and cascading."

Some of the research taking place at the Coastal Zone Observatory includes:

- Recording ocean data, such as temperature and turbidity, using sensor-equipped swarms of underwater robots.
- Studying the effects of ingesting microplastics on fish used for seafood.
- Analyzing microplastics consumption by tilapia and Magellanic penguins in collaboration with biologists from Radford University and Connecticut's Fairfield University.

The Center for Coastal Studies is part of the Fralin Life Sciences Institute.

The new endeavor is possible because of the generosity of Virginia Tech alumni Bill '86, M.S. '98 and Carol Seale '88. Their generous support has enabled Weiss and his team to develop a comprehensive plan to begin ocean monitoring.

"The Coastal Zone Observatory's work is a critical step forward to help us become better stewards of the world's oceans, which are arguably our most critical resource on Earth," said Bill Seale.

a vector, or carrier, transporting microorganisms from the ocean into the atmosphere. Foroutan's team will use the data to develop a process model to estimate the surface flux, or emission, of sea spray MNP aerosols.

"Although the number of particles captured through our small-scale filtration may seem small, when you scale the data up with consideration for an entire ocean or section of an ocean, the exponential change is huge," said Foroutan. In fact, in a recently published manuscript, they estimated the upper limit of yearly MNP oceanic emission to be 1.66 (0.72-4.13) tons per year.

Also, this specific research topic, Foroutan leads an interdisciplinary work group at Virginia Tech to collaborate about the plastic pollution. The group will coalesce around four primary themes: pollution reduction, health, environment, and policy and outreach.

"By working together, we intend to break down the barriers that sometimes exist between disciplines so that we can tackle this problem systematically," Foroutan said. "Biologists, engineers, economists, we all have a role to play in finding solutions to plastic pollution."

Foroutan also is committed to sharing information about plastics with students and families in the community. During the spring semester, the team connected with 60 fifth graders in Pulaski County, Virginia. In addition, his team is developing an educational exhibit at the Science Museum of Western Virginia in Roanoke, Virginia, to illustrate the physics of sea spray aerosols as well as marine and atmospheric microplastics, using a scaled-down version of the tank being used in the project.

Over the summer, the graduate students associated with the project will share plastics information at summer camps at Virginia Tech that are aimed at pre-college students. Through a hands-on, problem-based experiment, campers will use microscope and image processing techniques to characterize airborne plastic particles.

"Looking toward the future, the problems will be different," said Foroutan. "But by teaching our children and youth what we know now, we can instill a sense of responsibility to position them to address the next stages in plastic pollution whatever that may be."

From educating kids visiting the museum to helping environmental scientists who study airborne particles daily, this project has potential benefits for communities the world over.



# trash talk

About 119 billion pounds of food is wasted in the United States each year, according to statistics released by Feeding America.

This waste results in greenhouse gas emissions and carries an annual economic loss of approximately \$165 billion from the food, water, energy, and chemicals invested in the food supply chain.

Earlier this year, researchers in the College of Agriculture and Life Sciences received a \$2.4 million grant from the U.S. Department of Agriculture to create bioplastics from food waste diverted from landfills.

The three-year grant will test the scalability and feasibility of converting these wastes into bioplastics on a national and global scale while keeping costs for the bioplastics as low as possible.

The project also tackles the environmental challenges resulting from oceanic plastic pollution. Because plastics created from food waste biodegrade quickly in water, they have the potential to reduce adverse effects on marine life across the globe.

The first-of-its kind pilot project will focus on developing a bioprocessing system to produce such biodegradable bioplastics from food waste.

“This pilot project is a watershed moment in the production of plastics,” said Zhiwu “Drew” Wang, the principal investigator, assistant professor in the Department of Biological Systems Engineering, and director of the Center for Applied Water Research and Innovation.

Traditional plastics are made from petroleum-based oil. Following a similar principle, bioplastic can be made from biological oil, such as animal fat, plant-based oils, or microbial “fat.”

The researchers employ microorganisms to consume food waste, encouraging them to grow fats, or biological oils. Those fats are then harvested, purified, and processed into bioplastics.

Haibo Huang, associate professor in the Department of Food Science and Technology in the College of Agriculture and Life Sciences, and Young Kim, associate professor in packaging systems and design in the Department of Sustainable Biomaterials in the College of Natural Resources and Environment, also are involved with the project. ■



## WASTE NOT

Learn more about microplastics at [news.vt.edu/magazine](https://news.vt.edu/magazine).

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“THIS PILOT PROJECT IS A WATERSHED MOMENT IN THE PRODUCTION OF PLASTICS.”

Zhiwu “Drew” Wang  
assistant professor



# LASTING LESSONS

BY CYN A MIRZAI

*EDITOR'S NOTE: Cyna Mirzai graduated in May with a bachelor's degree in multimedia journalism and a minor in political science. She spent her senior year working as a paid student writer for Virginia Tech Communications and Marketing.*

When first-year students arrive at Virginia Tech, everything is exciting. Choosing a major, discovering new friends, and imagining what life in four years may look like are part of what makes the college experience so special.

But not long after new students settle into college life, another worry looms large: finding an internship.

For college students, anticipating an internship feels a lot like having an anxiety attack. For some, there is tremendous pressure over when to find an internship and whether to search for one that is paid or to accept an unpaid opportunity. Others stress over how many internships they should pursue or if they have been offered just one, wonder if that is enough to add value to a resume.

A 2023 graduate myself, the past four years were consumed either by current internships or looking ahead to what potential internship I could explore next. Each school year seemed to end with me scrambling to find an internship, and the feelings of distress and even despair were ever-present. Still, I continued the application process each year, and what came after those initial moments of dejection were the most important job-related experiences of my college career.

The majority of graduates of Virginia Tech say they had some kind of career-related experience as students, according to Virginia Tech Career and Professional Development, which surveys new graduates annually. When specifically referring to internship positions, 53 percent of 2022 graduates who responded to the survey indicated they had at least one internship during their time at the university.

Such numbers are leading Virginia Tech President Tim Sands and the Virginia Council of Presidents, which he chairs, into action. Sands and the Virginia Tech Board of Visitors also are committed to removing barriers and offering the full educational experience, including activities such as internships, to students regardless of income. The Virginia Tech Advantage, launched in fall 2022, aims to provide a strong foundation for academic success through enhanced resources, a community of peers and mentors, and scholarships and emergency funds.

Why is there a push for more students to have job-related experiences? Because they offer lasting lessons, Virginia Tech alumni from various degree programs, industries, and age groups say.

For these alumni, some internships were a perfect match, while others became a lesson in what they didn't want in a future career. Whether the internship was exactly what they expected or nothing they could imagine, alumni agree on one key point: internships are beneficial.



## FROM BLACKSBURG TO HOLLYWOOD

Ryan A. Paul, a rising senior majoring in public relations with minors in events and cinema, had a life-changing internship during the summer of 2022. Paul, who expects to graduate in December, served as a talent and public relations intern for the Television Academy's Emmy Awards from June to September.

While the internship was a defining moment of his college career, getting there was not exactly smooth sailing. Paul applied to about 75 internships, beginning in December 2021. By April 2022, he had no offers.

"I was getting discouraged and thought maybe I wouldn't have an internship that summer," Paul said. "But deep down, I knew there was something out there for me. I love big events such as the Super Bowl halftime show, stadium concerts, and award shows. With that knowledge, I began to apply to additional internships within live entertainment."

When Paul checked the Emmy Awards website, he saw an opening in talent relations for the summer leading up to the LA Area, Creative Arts and NBC Primetime Emmy Awards event.

Paul was offered the position. He packed his bags and moved to Los Angeles for three months.

Once there, Paul began to regret his decision. He was alone in a big city, thousands of miles away from friends and family, and he had only limited interest in talent relations.

But he found the event work exciting.

"Watching my supervisors handle the intensity of this industry and creative process was eye opening," he said. "I felt a lot of pressure because everything comes back to you in talent relations when you are waiting to hear back from publicists, agents, managers, and studios. Before this opportunity, I did not fully understand the amount of detail that went into Television Academy events, especially the five Emmy Awards produced."

Although talent relations was a new challenge for Paul, his overall internship experience was a clear indicator that he was in the right industry.

"I enjoyed the environment I was in because I love large-scale and big budget projects," Paul said. "So when the Emmys happened and I saw everything come together before my eyes, that was enough for me to know that this was the right space for me."

After what felt like a never-ending application process, he found appreciation for the power of patience and giving yourself grace.

"I would always overthink my interviews," Paul said. "I would spend too much time picking apart my answers. Eventually, I learned how to separate that anxiety from my delivery."

**"I ENJOYED THE ENVIRONMENT I WAS IN BECAUSE I LOVE LARGE-SCALE AND BIG BUDGET PROJECTS. SO WHEN THE EMMYS HAPPENED AND I SAW EVERYTHING COME TOGETHER BEFORE MY EYES, THAT WAS ENOUGH FOR ME TO KNOW THAT THIS WAS THE RIGHT SPACE FOR ME." -RYAN A. PAUL**



**“EVEN IF IT’S SOMETHING THAT YOU  
AREN’T VERY INTERESTED IN, OR MAYBE  
IT’S NOT THE COMPANY YOU WANTED TO  
WORK WITH, AN INTERNSHIP HELPS YOU  
OPEN YOUR MIND TO NEW EXPERIENCES  
AND NEW NETWORKING OPPORTUNITIES.”**  
**-CARRIE ROSE DORTCH '22**

## THAT FIRST INTERNSHIP

Carrie Rose Dortch spent the majority of her college summers working as a babysitter and nanny. A 2022 Virginia Tech alum with a degree in international relations, Dortch wasn’t sure what she would do after graduation. As her last college summer drew near, Dortch decided she wanted an internship rather than an hourly job.

“Government contracting is an interesting field,” said Dortch, who today is a contract administrator at Amentum. “I didn’t know anything about the industry or learn about it in college. After giving the human resources manager information about the future careers I was interested in, she recommended I apply for the contract analysis internship. But when I got the internship, I thought, ‘Why did they trust me with all of this?’”

In the beginning, Dortch was rarely involved in contractual work. Instead, she spent hours inputting data for contract managers. She felt no desire to continue the work after graduation.

As summer came to an end and Dortch began her senior year, however, she decided to continue the internship to gain more

experience. To her surprise, she was given a few contracts to manage, and she learned that, with more experience, she could take part in the work that interested her.

Dortch looks back on the experience and appreciates the vast number of connections she made.

“Even if it’s something that you aren’t very interested in, or maybe it’s not the company you wanted to work with, an internship helps you open your mind to new experiences and new networking opportunities,” Dortch said.

But she also said that, while students may feel pressured to pursue internships in college, it is completely normal if you don’t have one during most of your college years.

“That doesn’t mean you aren’t going to get a job,” Dortch said. “Try your best to have different experiences that could help your future career, but never feel bad about not having an internship when it feels like everyone else has one. Whenever it is meant to be, that time will come.”



**"AS A COMMUNICATION MAJOR [IN THE CORPS OF CADETS], THIS ROLE GAVE ME A LOT OF EXPERIENCE BECAUSE I WAS ACTUALLY ABLE TO DO HANDS-ON WORK THAT I NEVER GOT TO DO IN MY CLASSES." -MELISSA GABRIEL '19**

## CHANGE OF PLAN

Melissa Gabriel's journey didn't start at Virginia Tech, but rather at the United States Air Force Academy. Gabriel, now a first lieutenant in the U.S. Army, attended the academy for two years but ultimately saw that the school was not the best fit for her. Gabriel then spent two years attending community college, trying to figure out where to transfer to complete her degree.

"I knew I wanted to still serve, but I didn't like the environment of the Air Force Academy," Gabriel said. "So when I was doing my research, I came across Virginia Tech. I loved that there was a Corps of Cadets here and that there was a balance of living with other cadets but still being a part of the vibrant campus community that is Virginia Tech."

Gabriel, who graduated in 2019 with a degree in political science and communication and a commission into the Army, gained real-world work experience through the Corps of Cadets instead of a traditional internship. During her senior year, she was offered the position of regimental public affairs officer. Gabriel was tasked with running the corps' social media, so she

spent the semester creating content for the corps' Instagram page and YouTube channel as well as writing media releases for important events.

"As a communication major, this role gave me a lot of experience because I was actually able to do hands-on work that I never got to do in my classes," she said.

The position offered Gabriel new experiences and opportunities to develop professional skills that she can use in future positions. For example, Gabriel introduced the idea of doing a live question and answer event on the corps' Instagram account to support high school students interested in attending Virginia Tech and joining the corps.

Now, as a field artillery officer in the 82nd Airborne, Gabriel continues to engage in public affairs work for her unit, helping to run the unit's Instagram and Facebook accounts. As her time in the Army continues, Gabriel sees herself working in psychological operations or strategic marketing.

## FROM THE '90s TO TODAY

Craig Struble '93 earned a degree in computer science. He went on to receive a master's and a doctorate in computer science and applications from Virginia Tech, as well. But even after more than 20 years, Struble still looks back fondly on his internship years.

Struble, who is now the director of automation and data engineering at PacBio, a biotechnology company that develops systems for gene sequencing, participated in a co-op program that connected undergraduate students to three internships. Struble worked with Nortel Networks, which was a part of the telecom industry—his first opportunity to use his skills and apply them to a very particular industry.

"I got a lot of exposure in working with senior engineers and working in a team environment," Struble said. "It helped me learn what it was like to work on official projects and work with important people who were outside of my field."

Since then, Struble has worked as a professor at Marquette University in Milwaukee and as a director for computation sciences and engineering at Inscripta Inc.

Struble is excited about a push that encourages more internships for students.

"Whether it's understanding the work environment or what type of job you want, internships let you do that," he said. "Cultures are different in every company, so having different internships at different places is the best thing you can do to set yourself up for success."

## DESTINED FOR SUCCESS

Virginia Tech Career and Professional Development conducts a First Destination Survey among recent graduates each year. The office uses this data to explore the impact of work-based learning for students who land at a "first destination" within six months of graduation—these could include employment, admission to graduate school, or military commissioning.

The results from 2021-22 indicated:

- Students who work part-time jobs are 20 percent less likely to report a first destination.
- Students with paid internships are 110 percent more likely.
- Students with co-ops are 140 percent more likely.
- Students with undergraduate research experience are 40 percent more likely.
- Female and underrepresented students are less likely to have had paid internships.

The data supports the value of paid internships, as supported by President Tim Sands. The Virginia Council of Presidents, chaired by Sands, has made a commitment to work toward the availability of a paid internship for every student who wants one, that will not extend a student's graduation timeline



**“WITH THE RIGHT ATTITUDE AND MINDSET TO ADD TO THE TEAM’S DIVERSITY OF THOUGHT, YOU ARE TREMENDOUSLY MORE VALUABLE THAN JUST BEING AN INDEPENDENT ENGINEER. THOSE ARE THE TYPES OF PEOPLE WE WANT ON OUR TEAM.”**  
**-ANTUAN BYALIK '14, M.S. '15**

## A TRIAL RUN

Antuan Byalik—who earned bachelor’s degree in economics and computer science in 2014, followed by a master’s in computer science in 2015—had a host of internships during his four years at Virginia Tech. Now a software engineering manager at Bloomberg, Byalik credits those experiences for his professional advancement and 7 1/2 year tenure at his current position.

Byalik said a career fair he attended as a student helped him find internships at companies such as Bloomberg, Northrop Grumman, and Amazon. The most important thing he learned was knowing what he didn’t like.

“While the work was often interesting, I was so far removed from my end users that the feedback loop was often quite long,” Byalik said. “I found myself wanting something faster paced where I could see my work in action by end users and iteratively.”

“I think it’s more important to know what you don’t like rather than what you do like,” he said. “For me, it was really important that I realized I didn’t want to work at a government contracting space and an internship helped me see that clearly.”

Byalik also liked that internships gave him a trial run of how companies in his industry work. It can be difficult to know how businesses operate before you graduate without an internship, he said.

“Internships aren’t forever,” he said. “Rather, they allow you to have a short period of time to understand what you are looking for when you want to start your career. Especially if you are at a company that really treats you like an adult in your internship, it can be an incredibly eye-opening experience for what it’s like to be a full-time employee in your field.”

Byalik now works with Bloomberg’s interns. He said the biggest thing he looks for in interns on his team is how eager they are to learn.

“I value a strong culture fit that will bring the team up overall, rather than someone who might just be strong technically,” he said. “With the right attitude and mindset to add to the team’s diversity of thought, you are tremendously more valuable than just being an independent engineer. Those are the types of people we want on our team.”



**"IT HELPED ME GAIN HANDS-ON EXPERIENCE THAT I COULD RELATE TO A JOB INTERVIEW PROCESS, SO EVEN IF YOU THINK YOU ARE NOT PICKING THE RIGHT INTERNSHIP, IT'S A FORM OF APPLICABLE EXPERIENCE, AND THAT WILL HELP YOU GET TO WHERE YOU EVENTUALLY WANT TO GO."**

**-REBECCA PEARSON '14**

## 400 HOURS

Rebecca Pearson's college career was nothing short of eventful. A 2014 graduate of the Pamplin College of Business, Pearson took part in a 400-hour internship program that was required by the hospitality and tourism management major during her senior year.

Pearson, today an industry affairs project manager for The Coca-Cola Co., points to this internship with the Fauquier County Fair, where she was the event and marketing coordinator, as her most memorable internship experience.

As an intern, Pearson conducted market research for people attending small events as well as an annual large event that served a huge population. Pearson was part of business decisions that determined how the organization would advertise to entice attendees to the annual event.

Pearson came away from the internship with an array of experiences and measurable data about her successes. She credits this in helping her receive 13 job offers after graduation.

"It helped me gain hands-on experience that I could relate to a job interview process," Pearson said. "So even if you think you are not picking the right internship, it's a form of applicable experience, and that will help you get to where you eventually want to go."

Pearson's internship took place during the school year, and she encourages students to consider opportunities that are remote and occur during academic semesters if a summer internship does not come into fruition.

"Even if it seems like everyone you know has a summer internship, there are also so many internships out there that provide a part-time role during the school year," she said. "And if you enjoy the work you do as an intern, it doesn't feel like extra schoolwork but instead more applicable and exciting work."





## THE VIRGINIA TECH ADVANTAGE

President Tim Sands and the Virginia Tech Board of Visitors have identified removing financial barriers and expanding resources for students as leading priorities for the university.

While Virginia Tech's graduation rates, mid-career salaries, and loan repayment rates are among the highest in the nation, tuition and fees at public institutions in Virginia are higher than national medians for similar institutions. The scholarships and grants Virginia Tech provides to reduce the cost of attendance for students and families are lower than the university's peers, especially for low- and middle-income students.

The Virginia Tech Advantage is a universitywide, multiyear commitment to offer the broad educational experience to admitted undergraduate students from Virginia, regardless of income. It is a reflection of the university's commitment to serve the Commonwealth of Virginia and its residents.

At scale, the program will remove barriers for more than 5,500 students from underrepresented and underserved communities.

**"I'VE LEARNED SO MUCH ABOUT MYSELF, ABOUT POLITICS, ABOUT RELATIONSHIPS WITH PEOPLE. IT'S A LOT YOU CANNOT LEARN IN TEXTBOOKS, BECAUSE YOU'RE IMMERSSED IN THE EXPERIENCE."**

**-CHRISTA POTGEITER**

*SENIOR, A VIRGINIA TECH HOKIES ON THE HILL PARTICIPANT (PICTURED FRONT ROW, SECOND FROM LEFT)*

It will provide a strong foundation for academic success through enhanced resources, a community of peers and mentors, and scholarships and emergency funds. It will help students enhance the value of their Virginia Tech degrees by providing opportunities for research, learning, and discovery inside and outside of the classroom or lab.

Through the Virginia Tech Advantage, students will have greater flexibility to pursue paid internships, which significantly increase the likelihood that they will land successfully in a job after college or pursue graduate education.

With the implementation of the Bridge Experience Program as the focus of the university's Quality Enhancement Plan in 2020, Virginia Tech has continued to use work-based experiential learning, which include internships and co-op experiences, to prepare students for successful careers beyond graduation.

According to research from Virginia Tech's Center for Excellence in Teaching and Learning, in-state students from rural areas are the least likely to participate in a paid internship, deterred by housing and relocation costs or the summer tuition required to get curricular credit for an internship.

Students thrive when they can apply classroom learning in professional contexts. The Bridge Experience Program supports the integration of experiential learning into departmental curricula. Students identify desirable opportunities through guided exploration in class. Bridge experience include undergraduate research, internships, and other place-based experiences that help prepare students for post-graduation life, a key component of student success. ■





# AROUND THE HOKIE NATION

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## CAREER CHANGE BEARS FRUIT

WHEN ZAK AND SHAWNA MILLER TOOK A VACATION TO northern California to visit one of Zak's former college roommates, the couple drove through Napa Valley, the nation's epicenter of winemaking.

After a few glasses and a little thought, they decided to pop the cork on a career change.

"We stopped through wine country, and I was like, 'You've got to be kidding me. This is really a job? This is so me,'" Shawna said.

The couple knew little about the winemaking process. They barely knew chardonnay from cabernet. But 16 years later, these two Virginia Tech alumni, who both hold degrees in forestry from the College of Natural Resources and Environment, own their own small but successful brand of wines, and Shawna stands as one of the top winemakers in the country.

Today, Earthshine Wines, which produces about 500 cases of wine annually, can be purchased through the business' website or sampled at Mia Carta Wine Lounge, a collective of premium boutique Napa Valley producers located in downtown Napa, California. People travel from all over the world to wine and dine in Napa, and a variety of Earthshine Wines from Shawna, a Christiansburg, Virginia native who was recognized last year as one of the most influential female winemakers in the world by Decanter Magazine, is available for their palates.

"It's great to receive those kinds of accolades," Shawna said. "But it's kind of a grain of salt for me because I just try to make the wines that I like and I think that our loyal fans will like. But it is

**FAMILY FIRST:** Zak and Shawna Miller have built careers in the winemaking industry, but they make sure their business endeavors don't become so overwhelming as to keep them away from their two children.

PHOTOS COURTESY OF SHAWNA MILLER



“

I DON'T THINK WE INTENDED TO STAY. I DON'T THINK WE EVEN CONSIDERED THAT WAS AN OPTION. WE JUST THOUGHT IT'D BE FUN FOR THE HARVEST OR SOMETHING FOR MAYBE A YEAR. **STARS WERE ALIGNED, AND HERE WE ARE STILL 16 YEARS LATER.**”

Zak Miller '04

always nice to get something that we can put in a magazine.”

The Millers' journey and subsequent successes started with that trip to Napa in 2006. At the time, they were both putting their forestry degrees to use in positions in Gainesville, Florida—he in an industrial forestry job and she in plant sciences at the University of Florida.

They had participated in wine tastings in Gainesville and once toured a winery that exposed them to the background of winemaking. Not fans of humidity, alligators, and mosquitoes, they were seeking to leave Gainesville anyway, and the trip to Napa opened them to new possibilities.

“We thought, ‘OK, we have forestry degrees. It’s plant science. Viticulture is not exactly the same thing, but they’re very similar,’” Shawna said. “I applied for a job and came out to work the harvest season, and he [Zak] was kind of like, ‘Oh yeah, whatever. I’ll see how it goes.’ Then after working in a winery, he got the bug, too.”

“She loved it and wanted to come out, and I was like, ‘Alright, let’s do it,’” Zak said. “I don’t think we intended to stay. I don’t think we even considered that was an option. We just thought it’d be fun for the harvest or something for maybe a year. Stars were aligned, and here we are still, 16 years later.”

Their aspirations could have died on the vine in a competitive industry that produced a \$276 billion impact on the American economy this past year, according to WineAmerica. Instead, they flourished.

When they first arrived in Napa, they took seasonal positions, and then they ventured around the world. They both worked temporary jobs in New Zealand, where the harvest season is the opposite of the United States’, and later Shawna helped with a harvest in Australia. When she returned to Napa, she accepted a full-time position at a local winery, where she worked in a lab monitoring the fermentation process. Zak, meanwhile, went and helped with a harvest in Chile.

“We just kept going and going and going, and every harvest, you learn something new,” Shawna said. “Every harvest is different because all the other factors of weather and this and the other are always different every single year. It keeps things interesting, for sure.”

Upon his return from Chile, Zak landed a job with Domaine Carneros, a high-end winery that specializes in sparkling

wines, and he has been there ever since. Shawna earned her extension wine-making certificate from the University of California, Davis and worked for a couple of different wineries before landing a position with Luna Vineyards that allowed her to run the winemaking operation, which she did for approximately a decade.

That job also provided them with a large opportunity.

The owner of Luna Vineyards passed away suddenly early last year, and the family needed to sell the winery quickly. Shawna saw this as an opportunity to turn her success at Luna into a venture of her own. With their encouragement, she worked out an arrangement with the family to acquire some of the wine in the cellar to start her own brand, Earthshine Wines.

The Millers knew they would not be able to afford a vineyard. The land, the grapes, and the infrastructure would cost into the millions, and they refused to take on such a large risk.

Instead, they agreed to rent a small winery space from a friend and assume Luna's grape contracts with local landowners. Zak would keep his job with Domaine Carneros, and Shawna would start the family's winemaking brand—named Earthshine, a term coined by Leonardo da Vinci, who describe a crescent moon at sunset as “the new moon taking the old moon in her arms.”

In essence, the Millers are honoring the past of Luna Vineyards and moving forward. The move has left them feeling anything but sour grapes.

“I never said, ‘No, we shouldn't do it,’ but it really was outside of my comfort zone and any plans that I'd ever had,” Shawna said. “I was very, very happy working at Luna Vineyards, and I probably would

have stayed there for a long time because they were a great family to work for.

“The wine business can be competitive because there's a lot of people that want to get into it, so I was definitely nervous. But I think sometimes the universe tells you to do something by way of making it happen for you whether you want to do it or not. So even if it doesn't work, I've definitely learned a lot and it's been interesting.”

So far, everything has been working smoothly aside from the occasional hiccup. Shawna handles the winemaking and the business details, while Zak plans the parties.

According to Shawna, Zak has the personality to handle such a role. In fact, he ordered Earthshine Wine business cards. His title on the card: “Trophy Husband.”

“She was like, ‘What do you need cards for?’” Zak said. “I'm like, ‘Well, you know, the party planner's got to be out meeting people and drumming up business, so I need something.’ That's my title on the card, just a tongue-in-cheek joke, but we have fun with it.”

Fun lies at the heart of their business model. The Millers host many dinner parties at Mia Carta and even held one this past fall for a group of Virginia Tech alumni.

They hope someday to host dinner parties at various spots around the country, but consumers do not have to wait until then to sample Earthshine Wine's product. They can join the business' Wine Club, which features a selection of wines in a biannual shipment in April and November, through the Earthshine Wine website. Membership also includes interactive online winemaking seminars with Shawna and Zak, as well as discounted wine and shipping throughout the year.

The Millers, though, are not interested in building a wine conglomerate. They still want time to enjoy their family, which includes two young children.

Perhaps better stated, they just want to keep enjoying the fruits of their labor.

“Once it gets too big and we become overstretched, that kind of takes us away from what we love to do,” Zak said. “Have a lot of fun, make really good wine we can share with family and friends, but keep it on a manageable scale. ... That's our goal.” ■ JR



## WINEMAKING 101:

Read more about Earthshine Wines at [news.vt.edu/magazine](https://news.vt.edu/magazine).





## BLACKSBURG FALL: PICTURE PERFECT

# JOIN US AT HOMECOMING OCT. 14

Tailgate with fellow alums before the Hokies take on Wake Forest. For \$10 you'll have access to food, drinks, and fun. Enjoy lawn games, music, a petting zoo, inflatables, meeting with groups from across campus, and more.



[ALUMNI.VT.EDU/HOMECOMING](https://ALUMNI.VT.EDU/HOMECOMING)



# CLASS NOTES

Alumni, we want to hear what you've been doing. Mail career, wedding, child, and death news to Class Notes, Virginia Tech Alumni Association, Holtzman Alumni Center, 901 Prices Fork Road, Blacksburg, VA 24061; email the information to [classnotes@vt.edu](mailto:classnotes@vt.edu); or submit online at [vtmag.vt.edu/submit-classnote.php](http://vtmag.vt.edu/submit-classnote.php), where photos may also be uploaded for consideration. For assistance, call 540-231-6285.

'62

**CAREER Frank A. Gourley Jr.**, Charleston, W. Va., stays busy in retirement. He coordinates a 44-bed community garden, makes improvements to his 70-acre family farm near Smith Mountain Lake, plays pickleball three times a week, hosts an art group biweekly in his backyard studio-shop, plays guitar in a weekly jam group, coordinates a weekly breakfast group, travels (Kenya and Alaska-Yukon this year), showed wood furniture in two juried exhibitions recently, and participated in three craft shows this year. He is currently working on his third family-related book.

'70

**CAREER Michael E. Guy**, Marion, Va., published a book of essays, "Standing on a Spinning Ball."

'73

**CAREER Christopher J. "Kit" Utz**, Naples, Fla., retired from teaching and coaching at the Community School of Naples after 26 years. He continues in the athletic department as the "Voice of the Seahawks."

'81

**CAREER Bevlee A. Watford**, Blacksburg, Va., who has been a Virginia Tech faculty member since 1992, was selected by President Joe Biden to serve on the National Science Board.

'84

**CAREER Susan H. Hilleary**, Marshall, Va., was named Fauquier County High School Teacher of the Year for 2022-23.

'85

**CAREER Thomas A. Dingus**, Pulaski, Va., was honored with the U.S. Government Award for Safety Engineering Excellence at the 27th Enhanced Safety of Vehicles conference this spring in Yokohama, Japan.

'86

**CAREER Matthew R. Heffernan**, Spartanburg, S.C., is vice president, broadcast hub services with Nexstar Media Group Inc.

'90

**CAREER Mary S. Mayes**, Ames, Iowa, received the 2023 Professional and Scientific Research Award from the College of Agriculture and Life Sciences at Iowa State University.

'98

**CAREER Patrick J. Ryan**, Spring, Texas, was appointed chief technology officer to support continued development of ABS as a maritime technology leader.

'00

**CAREER Marshall R. Eichfeld**, Midlothian, Va., is a senior engineer in the Alternative Project Delivery Division of the Virginia Department of Transportation.



Fred Sanford

## RENAISSANCE MAN

Fred Sanford '61 graduated with a degree in electrical engineering. He then served four years in the U.S. Air Force and afterward spent two years as an engineer in Silicon Valley.

Sanford later worked as a pilot for United Airlines for nearly 30 years. When Sanford wasn't flying airplanes, he worked as a boat captain, treasure diver, and commercial fisherman.

Sanford retired at age 51 and started building boats. However, he has spent nearly 20 years devoting his time to building airplanes. He built his first plane in 2005 and three more airplanes since then. He currently is building his fifth plane.

Apart from building planes, Sanford said he loves spending time outdoors. An avid hiker, he has climbed Mount St. Helens and Mount Kilimanjaro.

## '04

**CAREER Jason D. Colvin**, Springfield, Va., is vice president, strategy and marketing at Newbridge Marketing Group.

**Erin C. Poff**, Salem, Va., joined the Virginia Tech Institute for Critical Technology and Applied Science as director of finance and administration.

## '07

**CAREER Andrew W. Newland**, Charlottesville, Va., is principal at ADTEK Engineers Inc.

**Ashleigh W. Garnes**, Blacksburg, Va., general manager of Meridian Waste, was named to Waste 360s 40 under 40 awards list.

**CHILDREN Ashleigh W. Garnes** and **Matthew Jon Chandler '14**, Blacksburg, Va., a son, 2/4/23.

## '09

**CAREER Christopher Aaron Noble**, Blacksburg, Va., is head of the Virginia Tech Department of Mining and Minerals Engineering.

## '12

**CHILDREN Ashley Morgan Clifton**, Bunker Hill, W. Va., a son, 11/19/22.

## '15

**WEDDING Emily E. Preisendan Chandler**, Hamilton, Va., and **Matt Chandler '14**, 4/25/20.

## '16

**CAREER Frances B. Keene**, Blacksburg, Va., is Virginia Tech's vice president for Student Affairs.

## '19

**WEDDING Rachel A. Dougherty** and **Justin Peter Larkin '21**, Fairfax, Va., 9/17/22.

## '20

**CAREER Cody L. Santmyer**, Blacksburg, Va., a financial planning analyst with Agili, earned Certified Financial Planner designation.

**Blake R. Seydel**, Austin, Texas., a musician based in Austin, Texas, released his debut album, "Blake Robert" on March 31. The album is available on all platforms.

**WEDDING Jordan Bray** and **Austin Fox**, Blacklick, Ohio, 10/9/21.

**Taylor Young Hinton** and **Bryce Hinton**, Hagerstown, Maryland, 3/20/23.

## '21

**WEDDING Samantha Richard Dean** and **Dwight Dean**, South Hill, Va., 10/1/22.

## '22

**CAREER Evan I. Abramoff**, Blacksburg, Va., joined SOSH Architects as a project coordinator.



# SAVE THE DATES

We love celebrating the Hokie community. Attend one of our upcoming events in Blacksburg and beyond. To learn more, visit [alumni.vt.edu/events](https://alumni.vt.edu/events).

### JULY 24

Virginia Tech Night at the Washington Nationals

### JULY 27

Virginia Tech Night at the Richmond Squirrels

### AUG. 4-5

Volunteer Leadership Summit

### AUG. 24

Welcome to the City  
*(Locations across the country)*

### SEPT. 8-10

Virginia Tech Corps of Cadets Reunion

### SEPT. 9

College of Agriculture and Life Sciences Tailgate

### SEPT. 29-OCT. 1

Fall Family Weekend

### SEPT. 30

Pamplin College of Business Tailgate



### OCT. 14-15

## HOMECOMING WEEKEND:

Join colleges and groups at the Homecoming tailgate!

### FEB. 21-22, 2024

Giving Day

## STAY CONNECTED

Make sure the university has your up-to-date mailing address, phone number, and email address. You can easily check your information online and make updates. Visit [alumni.vt.edu/contact](https://alumni.vt.edu/contact).

You can also email your updates to [alumnidata@vt.edu](mailto:alumnidata@vt.edu). Make sure you include your full name and class year in the email.



# HOW TO CONNECT WITH AN ALUMNI CHAPTER



COURTESY OF D.C. METRO AREA CHAPTER OF VIRGINIA TECH ALUMNI ASSOCIATION

**FINDING A COMMUNITY AFTER GRADUATION** can be a challenge for many, but Christi Lineberry, director of chapters and regional engagement, says joining an alumni chapter can make a tremendous impact on life after college.

“The great thing about alumni chapters in particular is that you have people that you already have common ground with because you have a similar experience at Virginia Tech,” Lineberry said. “Especially if you’re someone who’s moving around a lot, being able to find people in your local area that you can easily connect with and help build your professional network is really helpful.”

Joining an alumni chapter can provide a myriad of benefits—most notably social experiences. Moving to an unfamiliar area or branching into a new career can feel isolating, but joining a chapter can ease the process.

“Come out to events,” Lineberry said. “That’s probably the quickest and easiest way to meet people. It doesn’t matter if you’re an introvert or an extrovert because

there’s always going to be somebody there that you can talk to and you really feel like you are a part of a community.”

While joining alumni chapters can seem daunting, Lineberry recommends starting off with an updated alumni profile. She advises to keep your information up to date through the Hokie portal at [alumni.vt.edu](http://alumni.vt.edu).

“You will be able to get emails from the alumni office about what activities are in your area and communication about upcoming events, community service projects, or even virtual programming that may be of interest to connect you with the locals,” she said.

The alumni association has more than 100 chapters across the country and around the world. The Washington, D.C., chapter is one of the biggest chapters in the country, serving over 40,000 alumni members in the surrounding area.

Vasanth Ganesan, president of the D.C. chapter, said the group’s primary focus is engaging with local alumni through

social events and volunteer opportunities. Members also are passionate about raising funds for local student scholarships.

“It becomes a really enjoyable social group where you can enact meaningful change,” Ganesan said. “A lot of Virginia Tech students are familiar with programs like The Big Event that also foster community engagement, so this is another way to give back to the university with your time and effort.”

There are other ways to stay connected as an alum if you are unsure about joining a chapter, Lineberry said.

“There are a million different ways to keep engaged with Virginia Tech, whether it’s mentoring with the career and professional development office or being on a board within your college,” she said.

Don’t know where to start? Lineberry points to a few specialized alumni groups that are a great place to begin your alumni journey. Find more information about each at [alumni.vt.edu](http://alumni.vt.edu).

- Multicultural alumni societies help alumni connect with people in similar identity groups.
- Young alumni committees are great for those who graduated in the last decade and are looking for people in a similar age group.
- Cornerstone Alumni are Virginia Tech’s most engaged and passionate alumni who graduated 50 or more years ago.

“No matter where you are in your life cycle, there is always a way to connect back into Virginia Tech that is meaningful for you,” Lineberry said. ■ CM

**HOKIE NETWORK:** Alumni chapters host a variety of educational, service, and social events such as these D.C. metro area chapter gatherings.





“

WHEN I SAW THAT SAN DIEGO WAS IN THE TOP FOUR IN AMERICA AS FAR AS HOMELESSNESS GOES, I KNEW THERE WAS WORK TO DO THERE.”

Laura Cieslukowski '02

# A HEART FOR THE HOMELESS

WHEN SHANE ROSS, PROFESSOR IN the Kevin T. Crofton Department of Aerospace and Ocean Engineering, took a research leave this past fall to focus on a project in San Diego, he expected a combination of work, sunshine, calm breezes, and lazy ocean waves.

He and his family never expected to spend a portion of their time feeding the homeless next to two Virginia Tech alumni, a husband-and-wife team who have devoted their lives to caring for a segment of people whom many view as burdensome.

Kevin and Laura Cieslukowski founded and oversee a nonprofit organization called We See You San Diego. Started in 2017, the organization focuses on caring for the homeless and helping them overcome the hardships of both addiction and life on the streets.

Ross and his family heard about the organization while attending a local church.

They went to a Tuesday night event and each subsequent Tuesday during Ross' three-month leave.

“It made me think about how they were really living out the *Ut Prosim*, ‘That I may serve,’ motto in what they’ve been doing,” Ross said. “It showed me that they not only see a need, but have the organizational skills, the follow-through, and communication ability to get things done. And more importantly, the desire.”

Kevin and Laura Cieslukowski met through New Life Campus Fellowship at Virginia Tech while pursuing degrees—Kevin in civil engineering and Laura in communications. Kevin graduated in 1999; Laura, in 2002.

The two eventually married and wound up in New York City. She was recruited for a radio gig in San Diego in 2016, and desiring a lifestyle change, they relocated to the West Coast.

“The first thing I did when we were recruited to go to San Diego was look to see what the situation with homelessness in San Diego was because it had been a dream to have a nonprofit to be able to do something that I was passionate about in addition to the radio career,” Laura said. “When I saw that San Diego was in the top four in America as far as homelessness goes, I knew there was work to do there.”

They first set out to find a church home for their family. One of the churches they visited promoted a Tuesday night dinner for the homeless. The Cieslukowskis later volunteered to oversee that dinner, changed the term to dinner “party,” and watched it grow.

The Cieslukowskis feed between 225 and 250 today, and anywhere from 50 to 100 volunteers from all over San Diego help. In 2019, church staff members suggested the Cieslukowskis form a non-

profit foundation to raise money for their efforts.

“I got a lot of really smart people to come around me and show me that part,” Laura said. “We just brought other people in that knew how to do different parts that I didn’t know how to do.”

The name We See You San Diego came from when the family lived in New York. While working out on an elliptical machine in a Queens gym, Laura listened to a podcast about marginalized people, with this episode centered on the homeless.

“I went home that day from the gym because I was crying, and then I was praying,” she said. “I felt like ‘Yeah, you’re going to work with people in the homeless community.’ Then I heard the words, ‘we see you’ when I was praying.”

The Cieslukowskis never have categorized homeless people as “homeless people.” Instead, they see this group of people as their “guests.”

The Tuesday night event now features a live band playing music. Volunteers serve food to the guests. There is also a gourmet coffee bar and an area where guests can pick up clothing, toothpaste, and deodorant.

The Cieslukowskis are quick to credit their volunteers. Some drive more than an hour just to be a part of the solution.

“My favorite part is seeing other people just serve and go after it,” Kevin said. “There are so many different people in the community who have come alongside of us. I’m really amazed when I see people come week after week, and they just want to serve.”

The Cieslukowskis spend a lot of time fundraising, and Laura uses her communication skills to advocate for the foun-

ation in various media outlets. The food for the Tuesday dinner comes from designated food donations, which helps. The Cieslukowskis cultivate donors, apply for grants, and sell merchandise, all to raise money to send their guests to local recovery programs.

They also are looking at purchasing a building and have a long-term goal of operating a recovery center. Theirs is a holistic vision of helping from the beginning of the journey to the end.

These are all bold, dynamic plans for a former radio broadcaster and a current civil engineer. But they believe their faith knows no boundaries.

“It’s how do you love people well, and how do you break down that wall of their homelessness,” Laura said. “The things we do are ways we try to make people feel seen.” ■ JR

“

**MY FAVORITE PART IS SEEING OTHER PEOPLE JUST SERVE AND GO AFTER IT.** THERE ARE SO MANY DIFFERENT PEOPLE IN THE COMMUNITY WHO HAVE COME ALONGSIDE OF US. I'M REALLY AMAZED WHEN I SEE PEOPLE COME WEEK AFTER WEEK, AND THEY JUST WANT TO SERVE.”

Kevin Cieslukowski '99



## WE SEE YOU

Watch a video about the Cieslukowskis at [news.vt.edu/videos](https://news.vt.edu/videos).



1



**1. LET'S GO HOKIES** Fans, including (from left) Shelby Sminkey, Mariah Raskin, Melissa Booker, and Chris and Bay Bryan, turned out to support the women's basketball team at the Final Four in Dallas.

**2. BAR23!** (at left) Laurie Brogdon, Black Alumni Society president, and Latanya Walker enjoyed a spring game tailgate during Black Alumni Reunion. (at right) Attendees of Black Alumni Reunion received a commemorative shirt that pays homage to Hokie greats.

**3. CELEBRATING BLACK EXCELLENCE** Vonda Paige, vice president of the Black Alumni Society, hosted the Influential Black Alumni Awards in the Commonwealth Ballroom at Squires Student Center.



2



3

# in FOCUS



4

#### 4. SUPPORTING SCHOLARS

Renny Lynch attended the Endowed Scholarship Banquet hosted by the Hokie Club in the Rector Field House.

#### 5. 150 YEARS OF HOKIES

Hokie Nation wrapped up a year of celebrating Virginia Tech's Sesquicentennial in Roanoke with a special guest.

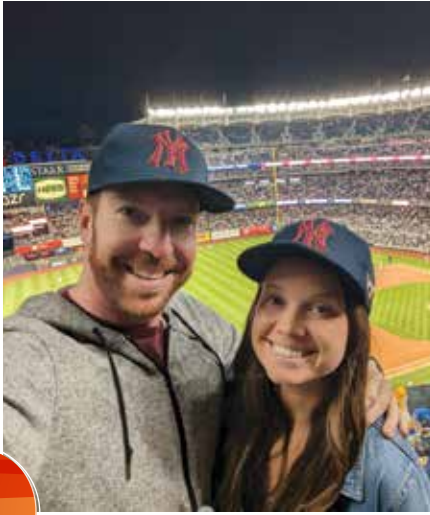
#### 6. WELCOME TO CHARLOTTE!

Young alumni gathered at Wooden Robot Brewery for networking and fun at a Welcome to the City event.

5



6



7

**7. GAME NIGHT** (at left) Lew Dickinson '68 and his wife, Sue Force Dickinson, attended Virginia Tech Night at Yankee Stadium with two of their grandchildren. (at right) Andrew and Jacquie Merewitz enjoyed an evening with fellow Hokies at Virginia Tech Night at Yankee Stadium. The Yankees took the win in the 10th inning. Attendees received a commemorative ball cap with maroon and orange insignia.



8

**8. THIS IS HOME** Attendees of Black Alumni Reunion had a full schedule of fun during the event, including spending some time in Lane Stadium for the spring game.

**9. LIVING HIS LEGACY** Students posed with Irving Peddrew during Black Alumni Reunion. Peddrew-Yates Hall, co-named in his honor, is home to the Ujima living-learning community, which provides students with resources and a support system that enriches the Black student experience.

9



# GROWING CAREERS

### LAUREN GREGORY

#### A BUDDING PASSION



Lauren Gregory '19 is a grower working for Saunders Brothers Inc. in Piney River, Virginia. But not long ago, she didn't think she had a green thumb. At least not until a wilting houseplant found its way to her door.

It was up to Gregory to save it.

With delicate care in the spring of 2016, Gregory began the revival process. Slowly but surely, the plant began to reflect the love and effort put in by Gregory. Before long, it was thriving.

"It was one of those things, while simple, that was a coming-of-age experience," Gregory said. "My grandpa was a sweet corn farmer that sold to local stores. My grandparents and parents all had gar-

dens growing up. When I brought that plant back from the dead, I realized I had a knack for it too."

Her hometown of New Kent, Virginia, nestled between Richmond and Williamsburg, is small. Gregory began her collegiate experience as a first-generation student at Thomas Nelson Community College in nearby Williamsburg before transferring to Virginia Tech's College of Agriculture and Life Sciences.

At Virginia Tech, Gregory wanted to understand the symbiotic relationship between plants, so she joined the School of Plant and Environmental Sciences while also choosing a minor in entomology—both areas she uses daily in her career.

When Gregory initially toured Virginia Tech, she was introduced to the horticulture program by Alex Niemiera, a professor in the School of Plant and Environmental Sciences. Whom she met and what she saw were magnificent.

"Everything I saw—the professors, the facilities, the Hahn Horticulture Garden—it just pulled me in," Gregory said. "I had great mentors and leaders to look up to and had fantastic hands-on learning opportunities."

In college, Gregory saw how the soil interacts with the plants and how plants pull nutrients from the soil. She saw how the soil layers, compaction, and oxy-

genation in the soil changes—and what makes those processes happen.

"I'm at a container nursery now, so we only really work with soilless media," she said. "But my classes at Virginia Tech changed how I approach this. I'm always looking at the outcome—how we can get the plants to be exactly where they need to be once at their final destination in the ground."

### JASON CHAVEZ

#### A VOICE FOR ARIZONA'S NATIVE AMERICANS



As a Virginia Tech student, Jason Chavez spearheaded change for the Native American community on campus and in the region. Now he's leading change in Arizona as director of tribal affairs for the state's new gubernatorial administration.

As a member of the Tohono O'odham Nation, a federally recognized tribe in

southern Arizona, Chavez sees special meaning in his new appointment.

“The significance is not lost on me, as an Indigenous person,” Chavez said. “It’s remarkable because I’m not here as an invited guest. I’m here to have a seat at the table, to help set expectations and make policy and decisions for the governor’s office.”

Chavez was working as an elections official in his home county of Pima County, Arizona, before he moved with his wife to Virginia and decided to go back to school. At Virginia Tech, he earned his bachelor’s degree in 2019 and then his master’s degree in 2020, both in political science.

After graduating, he took a position as election outreach manager at the Arizona Secretary of State’s Office. That job presented an opportunity to apply the knowledge he’d gained from his research to make a positive impact during the 2020 election.

“Everything was unknown—how do you conduct an election during a pandemic?” Chavez said. “So it was rewarding to be able to apply my classroom knowledge out in the world.”

His experience in elections and tribal outreach led to incoming Gov. Katie Hobbs asking him to join her administration. As director of tribal affairs, Chavez serves as a liaison to the state’s 22 Native tribes and nations to create strong partnerships between the state government and the Indigenous peoples.

In this position, he hopes to tend to some of the most critical needs of Arizona’s Native people, including creating economic opportunities, promoting access

to voting and health care, and addressing the crisis of missing and murdered Indigenous people.

“A big part of what we were trying to do at Virginia Tech was fighting that invisibility,” Chavez said. “We’re still here. Native Americans are not a thing of the past. And we’re still doing great things.”

## MICHELLE GABE

### A MARKETING ‘HOT’ SHOT



Oprah Winfrey has consistently named it on her heralded favorite things list. Jason Derulo, Bobby Flay, and Courteney Cox are some of the influential names behind the product.

TRUFF, a luxury condiment brand, has burst onto the foodie scene over the past five years. And a Virginia Tech graduate is the marketing guru behind the truffle-infused hot sauce.

Michelle Gabe '13, an alumna of what is now the School of Communication, helped elevate TRUFF from another brand looking for a share in the market to a worldwide sensation. Under her tute-

lage as marketing director since 2020, TRUFF launched its first-ever sauce-on-sauce collaboration with Hidden Valley Ranch. The sauce sold out online in less than a minute. Gabe also assisted in forming a partnership with Taco Bell to sell Loaded TRUFF Nacho Fries at the chain’s more than 7,000 locations nationwide.

Her work hasn’t gone unnoticed. Ad Age recognized Gabe on its annual 40 Under 40 list this past year.

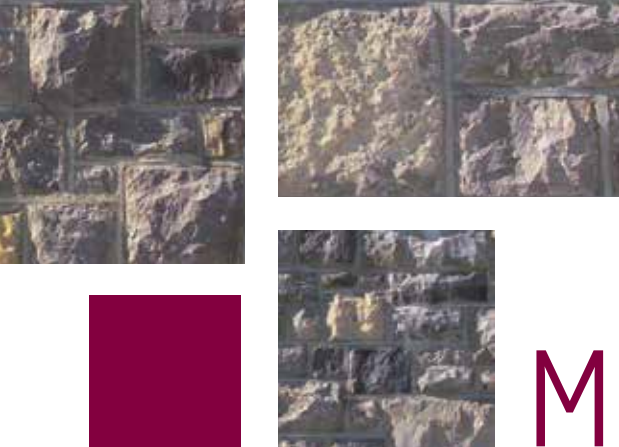
Gabe spent much of her career with SHADOW, a public relations agency, and ended up becoming the first director of consumer packaged goods at SHADOW before turning 30. She desired to go on the brand side, and after working with disruptors such as Bulletproof, Victorinox Swiss Army, and Health-Ade, she landed a dream client in TRUFF, which later invited her to come in-house as a marketing director.

Just in the past year, the company has partnered with Taco Bell and Hidden Valley, developing name recognition despite being just 5 years old.

“Moments like this show that there are so many opportunities for creativity, thinking, learning and developing relationships as long as you have faith in your brand and know what assets you have to offer,” Gabe said.

Gabe always is willing to offer advice to Virginia Tech students interested in joining the marketing profession.

“Persistence breaks resistance,” she said. “Lots of things don’t go as planned, but if you know what you want and are persistent about it, things will start to line up.” ■



# MILITARY MENTOR

**AFTER RETIRING FROM THE MILITARY,** Col. Tom Roberts Jr. finds taking it easy to be much too hard.

He prefers being tired to being retired.

Roberts '62, spends much of his time these days serving on various committees, councils, service clubs, associations, and boards of directors, including the Virginia Tech Corps of Cadets alumni board. After graduating from Virginia Tech with a degree in business administration, Roberts spent 34 years in the Army before retiring, but he's unretired on multiple occasions since, always to help those around him.



Roberts established and was the principal instructor for the criminal justice program at Augusta Technical College in Augusta, Georgia. Later, he was appointed U.S. marshal for two presidential terms. Eventually, he returned to the Army as an international political officer, serving a tour in Iraq with the 3rd Infantry Division. His volunteer law enforcement liaison work in public-private partnership development with ASIS International earned him the Roy N. Bordes Council Member Award of Excellence for 2014.

Arguably, no one has lived the university's motto, *Ut Prosim* (That I May Serve), more than Roberts.

"Service has been my life," Roberts admitted.

Today, the 84-year-old mentors the leadership in the 385th Military Police Battalion headquartered in Fort Stewart, Georgia. Roberts lives in nearby Savannah, and drives to Fort Stewart to meet with officers and the battalion commander who oversees approximately 800 military police.

Recently, the commanding general awarded Roberts "rock star" status for his work.

"Basically, what we start off doing is talking about leadership challenges—guys

getting in trouble or going in the wrong direction or officers or noncommissioned officers getting out of the service or law enforcement challenges," Roberts said. "We talk about alternatives and strategies. It's a free-flowing conversation."

Roberts returned to active duty in the Army at age 70 as an advisor on policing and security to the commanding general of the 3rd Infantry Division.

Most soldiers would not be eager to return at that age, but Roberts said he felt that calling.

"That's just the way I'm built," he said. "My father spent about 37 years in the Army Reserve. Service before World War II was voluntary without pay. ... That's just in our family. That's just the way we are."

A traditional post-retirement life isn't in Roberts' DNA. For him, this is his retirement plan.

"As long there are very bright young officers and NCOs, even older officers doing God's work in our military looking after the troops, I'll be there," he said. ■ JR



## GUIDING LIGHT

Read more about Tom Roberts Jr. and his career at [news.vt.edu](https://news.vt.edu).

**CORNERSTONE ALUMNI** like Tom Roberts Jr. are Virginia Tech's most engaged and passionate alumni who have served as the foothold of the university for more than 50 years. The group is made up of alumni who graduated 50 or more years ago. They represent the foundation of our university and its motto *Ut Prosim* (That I May Serve) and their legacy will be felt for years to come.

To learn more, visit [alumni.vt.edu/groups/cornerstone-alumni](https://alumni.vt.edu/groups/cornerstone-alumni).







ALUMNI WEEKEND 2023

# SUMMER FUN

## OUR BIGGEST CELEBRATION YET!

A favorite Virginia Tech tradition returned this summer with more than 1,300 Hokies celebrating in Blacksburg and beyond.

Each summer, Hokies arrive in Blacksburg for a weekend of unique opportunities and the chance to explore a quieter campus. Virginia Tech's first summer event was in 2018.

This year, almost 1,000 Hokies returned to Blacksburg June 8-11 to celebrate at Alumni Weekend and another 376 joined virtually.

The four-day event included behind-the-scenes campus tours, dinner and live music on the Drillfield, happy hours, activities for young Hokies, presentations from university leaders, a town hall with President Tim Sands, a farewell brunch with Virginia Tech coaches, and more.

The Hokie Spirit spanned generations as Cornerstone Alumni, recent graduates, and everyone in between celebrated the bond they share with their alma mater. Next year's event is in the works and set for June 6-9, 2024. ■ AM



## BACK IN THE BURG

Read more stories from the weekend, see photo galleries from weekend events, and learn about Alumni Weekend 2024. Visit [alumni.vt.edu/weekend](http://alumni.vt.edu/weekend).

## DIG THIS

EARLIER THIS SPRING, VIRGINIA TECH Magazine reached out to alums to learn more about how Hokies display Virginia Tech through their gardens and landscapes. From floral colors to flags, and even a visiting turkey, Hokie homes definitely reflect Hokie spirit. ■



Brian Prtichard '57, M.S. '59  
Suffolk, Virginia



Michael Smith '01  
Lorton, Virginia



R. Mark Kozak '78  
Chesapeake, Virginia



Bonnie '79 and Gilmore "Jeff" Lunsford '78  
Evans, Georgia



# Traveling HOKIES™

Barcelona, Spain

## CONNECT. LEARN. EXPLORE.

GO ON A JOURNEY WITH FELLOW HOKIES. LET VIRGINIA TECH BE YOUR GUIDE WITH TRIPS FOR ALL EXPERIENCE LEVELS AND BUDGETS. OUR TOURS ARE OPEN TO ALL VIRGINIA TECH ALUMNI, FRIENDS, AND FAMILY. HERE'S A LOOK AT WHAT'S COMING UP.

**Great Trains and Grand Canyons**  
(Sept. 24-30)

**Albuquerque Balloon Festival**  
(Oct. 11-17)

**Radiant Spain and Italy**  
(Oct. 10-20)

**Greek Isles and Turkish Riviera**  
(Oct. 24-Nov. 3)

*If you've traveled alongside Hokies, you know how special our trips are. Share your memories and photos with us, and we'll spotlight some of your experiences in an upcoming issue of Virginia Tech Magazine. Email us at [alumni@vt.edu](mailto:alumni@vt.edu).*



ALUMNI.VT.EDU/TRAVEL

For more information about this trip and other travels tours, go to [alumni.vt.edu/travel](http://alumni.vt.edu/travel).

## RADIANT SPAIN & ITALY

DATE: OCT 10-20, 2023  
STARTING PRICE: \$3,449

From Barcelona to Rome—live your best life on this 10-night cruise aboard Oceania Cruises' Riviera. Begin in beautiful Barcelona and set sail along the sunny Mediterranean. **Hosted by Oceania Cruises' Executive Culinary Director and world-renowned Master Chef Jacques Pépin, this culinary journey treats you to signature menus, exclusive talks, cooking demonstrations and other special opportunities.**

# FAMILY

**1** “We met at a Virginia Tech football tailgate in 2016. We graduated with mechanical engineering degrees in 2020. And in 2023, we celebrated our wedding day at the Hemingway Home in Key West, Florida,” —Taylor Young Hinton '20, Hagerstown, Maryland, who married Bryce Hinton '20, 3/20/23.



**2** “I’m happy to pass along the news of our fall 2022 wedding in White Plains, Virginia, to the entire Hokie Nation,” —Samantha Richard Dean '21, South Hill, Virginia, who married Dwight Dean '21, 10/1/22.



**3** “Hokie Nation family and friends made our wedding day the best day ever.” —Rachel Dougherty '19 and Justin Larkin '21, Fairfax, Virginia, who were married 9/17/22.

**4** “Originally high school sweethearts, we celebrated our forever future surrounded by fellow Hokie graduates John Harsh '20, Raymond Hall '20, Nick Williams '20, Jae Hu Kim '19, Austin Cunningham '19, Emilie Berger '20, and Laura Moss '20.” —Jordan Bray '20, Blacklick, Ohio, who married Austin Fox '20, 10/9/21.



A silhouette of a person holding a net against a sunset background. The person is in the foreground, and the net is held up, showing some small, dark objects inside. The background is a bright sunset with orange and yellow light filtering through the branches of trees.

## STILL LIFE

### OVER THE RIVER AND THROUGH THE WOODS

In the spring, students in the biodiversity conservation capstone course—a requirement for the biodiversity conservation minor—visited the Diamond Hills wetland in Christiansburg, Virginia, to survey plant life, amphibians, and birds. After compiling and summarizing the data, the class presented their findings to officials with the Town of Christiansburg.

“Obviously doing case studies and doing projects in a classroom is very valuable, said Kevin Hamed, collegiate associate professor, who helps coordinate the class. “We were looking for a real-world application. We wanted our students to be able to tackle real-world questions, solve real-world problems. And at the same time live by *Ut Prosim* and give back to the Town of Christiansburg.”

To learn more, watch a video about the class at [news.vt.edu/videos](https://news.vt.edu/videos).



# IN MEMORIAM

Listing includes notices shared with the university from Nov. 21, 2022, through March 31, 2023.

## '43

**Robert E. Davenport Jr.**, New York, N.Y., 11/23/2022.

## '44

**John A. Johnson Jr.**, Virginia Beach, Va., 12/24/2022.

## '45

**Claude C. Arthur**, Richmond, Va., 12/20/2022.

**Samuel "Ackie" Loyd Jr.**, Waynesboro, Va., 12/1/2022.

**Herbert M. Mandel**, Pittsburgh, Pa., 3/11/2023.

**Thomas M. Starling**, Fayetteville, Ga., 2/5/2023.

## '48

**David S. Farmer Jr.**, Farmville, Va., 12/2/2022.

**John "Carlton" George Sr.**, Warsaw, Va., 11/19/2022.

**Evelyn Gardner Marshall**, Charlottesville, Va., 1/6/2023.

## '49

**Doris Tate "Peggy" Cobbs**, Vinton, Va., 12/30/2022.

**Vernon D. Grizzard Sr.**, Rome, Ga., 6/16/2022.

**Edwin W. "Bootsie" Rice**, Reedville, Va., 1/1/2023.

## '50

**Byron H. Hale**, Clinton, Tenn., 10/25/2022.

**Lucius S. Jacob Jr.**, Peachtree Corners, Ga., 10/13/2022.

**Robert L. Matthews**, Far Hills, N.J., 11/29/2022.

## '51

**Roger R. Neel Sr.**, Riner, Va., 12/4/2022.

**Robert L. Nordstrom**, Chesapeake, Va., 10/27/2022.

**Leslie C. Pugh**, Floyd, Va., 12/5/2022.

## '52

**Henry H. Buck Jr.**, Salisbury, N.C., 3/24/2023.

**Whiteford D. Grimes**, Chapel Hill, N.C., 12/22/2022.

**June Maile Hardy**, Durham, N.C., 7/14/2022.

**Thomas D. Jennings**, Roanoke, Va., 11/22/2022.

**William M. Mandeville Jr.**, Flushing, N.Y., 11/15/2022.

**Billy O. Moody**, Glen Mills, Pa., 11/11/2022.

**Marvin "Gilbert" Porter**, Franklin, Va., 12/31/2022.

**Robert E. Quig Sr.**, Isle of Palms, S.C., 10/25/2022.

**Mills A. Riddick V**, Mount Dora, Fla., 12/8/2022.

**Dorris "Neal" Stidham**, Orange Park, Fla., 12/30/2022.

## '53

**Anne Horton Adams**, Dry Fork, Va., 1/31/2023.

**Richard S. Andrews**, Florence, S.C., 12/13/2022.

**John T. Breth**, Orchard Park, N.Y., 1/27/2023.

**L. Ward Edwards**, Winchester, Va., 11/19/2022.

**James A. Hepner Sr.**, Maurertown, Va., 11/22/2022.

**James W. McConnell**, Blountville, Tenn., 1/29/2023.

**George W. Mills**, Virginia Beach, Va., 12/31/2022.

**David W. Wright**, Powhatan, Va., 8/17/2022.

**Thomas Stark III**, Amelia, Va., 12/10/2022.

## '54

**Marshall P. Baum**, Chillicothe, Ohio, 12/7/2022.

**James P. Beard Sr.**, Fredericksburg, Va., 12/11/2022.

**Thomas K. Daughtrey Sr.**, Sandston, Va., 1/12/2023.

**John A. Geikler Jr.**, Lexington, Va., 9/24/2022.

**Harvey L. Hotinger Jr.**, Lexington, Va., 1/30/2023.

**Courtland C. Keeter**, Newsoms, Va., 2/4/2023.

## '55

**Ralph N. "Buddy" Greenway**, Salem, Va., 12/21/2022.

**Leon R. Pleasants Jr.**, Warrenton, Va., 12/17/2022.

## '56

**Randolph J. Maupin**, McGeheysville, Va., 12/19/2022.

**John L. Miller**, Bridgewater, Va., 2/23/2023.

**William "Roger" Mitchell**, Mechanicsville, Va., 2/22/2023.

**Charles G. O'Brien**, Pensacola Beach, Fla., 12/19/2022.

**Perry R. Stubbs Jr.**, Pearisburg, Va., 11/29/2022.

## '57

**Charles M. Clarke**, Suffolk, Va., 11/5/2022.

**William R. Greear**, Riner, Va., 11/15/2022.

**Charles C. Laney Jr.**, Portsmouth, Va., 11/6/2022.

**Norman "Lewis" Morris**, Spencer, Va., 12/9/2022.

**Robert B. Oliver**, Blacksburg, Va., 12/1/2022.

**Lee G. Scripture Jr.**, Heathsville, Va., 11/8/2022.

**James P. Veatch**, Baltimore, Md., 3/28/2020.

## '58

**Morris H. Bell Jr.**, Virginia Beach, Va., 2/2/2023.

**Virgil A. Burnett**, Stuart, Va., 12/9/2022.

**Jerry G. Curtis**, Rixeyville, Va., 12/21/2022.

**Joseph C. Hecht**, Jonesborough, Tenn., 10/19/2022.

**Gerard W. Hock**, Palm Coast, Fla., 6/11/2022.

**Donald T. Hundley**, Norristown, Pa., 11/25/2022.

**David D. Pedigo**, Midlothian, Va., 12/6/2022.

**Eugene A. Wilson**, Newport News, Va., 12/28/2022.

## '59

**Robert C. Allen**, Melbourne, Fla., 12/22/2022.

**Herman L. Bohon**, Newport News, Va., 12/14/2022.

**Richard J. Dillard**, Hilton Head Island, S.C., 1/27/2023.

**Richard E. Kidd Sr.**, Radford, Va., 11/26/2022.

## '60

**Edward W. Castellani**, Jacksonville, Fla., 2/3/2023.

**James D. Crunkilton**, Port Orange, Fla., 12/23/2022.

**Ronald D. Oslin**, Chattanooga, Tenn., 12/12/2022.

**Clarence C. Whitley**, Gautier, Miss., 3/20/2023.

## '61

**William M. Kegley Sr.**, Pulaski, Va., 11/9/2022.

**Jaime A. Pozo**, Key Biscayne, Fla., 12/3/2022.

**Harold H. "Sonny" Speed Jr.**, Christiansburg, Va., 11/22/2022.

**Robert M. Thompson**, Mount Airy, N.C., 11/21/2022.

## '62

**Frank E. Ferrante**, Abingdon, Va., 11/28/2022.

**James C. Ho**, Dover, Del., 3/12/2023.

**Benjamin J. Hyde III**, Kempner, Texas, 11/25/2022.

**James M. Paxton**, Henrico, Va., 1/5/2023.

**Channing G. Williams**, Richmond, Va., 12/28/2022.

## '63

**Fred L. Austin**, Pearisburg, Va., 3/7/2023.

**William L. Berry**, Southport, N.C., 3/9/2023.

**Ramon M. Hite**, Midlothian, Va., 12/21/2022.

**George P. Koch Jr.**, Fairfax, Va., 10/25/2022.

**Homer C. McCoy Jr.**, Elizabeth City, N.C., 12/22/2022.

**Donald E. Miller**, Vienna, Va., 12/2/2022.

**Richard E. Oliver**, Roanoke, Va., 3/19/2023.

**John A. Pearman Jr.**, Midlothian, Va., 3/16/2023.

**Bondili P. Rao**, Hyderabad, India, 10/30/2022.

**Andrew E. Stylianos**, Boca Raton, Fla., 12/27/2022.

**John L. Wonderley**, Pilot, Va., 11/29/2022.

## '64

**Gerald L. Buckner**, Midlothian, Va., 1/11/2023.

**Vince M. Calvert Jr.**, Bristol, Va., 11/27/2022.

**Henry B. Pack III**, Appomattox, Va., 2/5/2023.

**William L. Smith**, Henrico, Va., 12/23/2022.

## '65

**Robert D. Craft**, Norfolk, Va., 11/30/2022.

**Douglas D. Early**, East Peoria, Ill., 11/23/2022.

**Robert G. Fillingame**, Moneta, Va., 12/31/2022.

**Ronald D. Jackson**, Archbald, Pa., 11/20/2022.

**Adolphus G. "Buddy" Slate III**, Oviedo, Fla., 12/28/2022.

## '66

**John "Dwight" Bradshaw**, Suffolk, Va., 11/17/2022.

**Reese E. Graves Jr.**, Daphne, Ala., 1/25/2023.

**Roy L. Petty Jr.**, Venice, Fla., 12/25/2022.

**Waldo "Emerson" Rudacille Jr.**, Front Royal, Va., 2/5/2023.

## '67

**John C. "Troll" O'Brien Jr.**, Sun City Center, Fla., 9/22/2022.

**Randall D. Parks**, Eastville, Va., 12/30/2022.

**Vernon W. Snipes**, Midlothian, Va., 1/19/2023.

## '68

**William A. Duke Jr.**, Woodford, Va., 11/15/2022.

**Eugene G. Russell**, Humble, Texas, 12/28/2022.

## '69

**John M. Bridges**, Dallas, Texas, 3/1/2023.

**Donald W. Gayle**, Ruther Glen, Va., 12/9/2022.

**Charles V. Goudie Jr.**, Roanoke, Va., 12/25/2022.

**Carl D. Hicks Jr.**, Doswell, Va., 1/4/2023.

**Joseph R. Inge**, Williamsburg, Va., 3/23/2023.

**William L. Jackson**, Morgantown, W.Va., 10/11/2022.

**Hoyt C. Johnson Sr.**, Harvest, Ala., 1/27/2023.

**Joseph H. McGrady**, Hillsville, Va., 11/18/2022.

**Alan B. Mills Sr.**, Sparks, Nev., 12/13/2022.

## '70

**Heth T. Thomas**, Lynchburg, Va., 3/18/2023.

## '71

**Maryellen Cameron**, Falls Church, Va., 12/15/2022.

**Thomas E. Clatfelter**, Tulsa, Okla., 12/6/2022.

**Carl J. Ludwick**, Roanoke, Va., 1/3/2023.

**Paul H. Musick**, Lebanon, Va., 3/6/2023.

**Jonathan F. "Dusty" Rhodes**, Hampton, Va., 1/23/2023.

## '72

**Virginia A. (Williams) Alvis**, Abingdon, Va., 1/4/2023.

**Robert H. Brinkley III**, Nags Head, N.C., 12/28/2022.

**Frank P. Bongrazio Jr.**, Vincen- town, N.J., 11/22/2022.

**Ronald E. Jonas**, Auburn, Calif., 11/16/2022.

**Susan Schaler Langston**, Chama, N.M., 1/2/2023.

**Herman A. MacDonald**, Salem, Ore., 12/19/2022.

**Marcel U. Mgbodile**, Enugu, Nige- ria, 10/22/2022.

**Darwin L. Pippin**, Alpharetta, Ga., 11/13/2022.

**Helen Louise Weiss**, Ellijay, Ga., 7/6/2022.

## '73

**John K. Arbogast**, Roanoke, Va., 11/7/2022.

**William N. Baskervill Jr.**, Halifax, Va., 2/17/2023.

## '74

**John W. Hamill**, Warrenton, Va., 12/22/2022.

**Alan S. Heltzel Jr.**, Beaufort, N.C., 12/6/2022.

**David R. Lewicki**, Phoenixville, Pa., 10/15/2022.

**Stephen W. Rippard Jr.**, Virginia Beach, Va., 12/16/2022.

**Gerald I. Sexton**, Chattanooga, Tenn., 11/25/2022.

## '75

**Denise A. (Hylton) Krallman**, Lib- erty Township, Ohio, 12/25/2022.

**Anne P. (Welsh) Manson**, Charles City, Va., 12/7/2022.

**John J. Seeberger**, Madison, Va., 12/23/2022.

**James R. Tolson**, King George, Va., 11/27/2022.

**John O. Turnage**, Augusta, Ga., 2/16/2023.

## '76

**Sharon Dayhoff Ackerman**, Boynton Beach, Fla., 10/21/2022.

**Charles F. Battrell**, Wenatchee, Wash., 2/13/2023.

**Douglas C. Forbes**, Vinton, Va., 10/26/2022.

**L. Jennelle, Bastian**, Va., 3/18/2023.

**Elizabeth "Gay" Meredith**, Hiwas- see, Va., 11/10/2022.

**Bruce W. Morrell**, Henrico, Va., 2/3/2023.

**Elizabeth Agnew Ritchey**, Blacks- burg, Va., 11/21/2022.

## '77

**Stuart E. Daniel**, Chesterfield, Va., 3/12/2023.

**Paul J. Davidson Jr.**, Moneta, Va., 2/5/2023.

**Jerald P. Facenda**, Pensacola, Fla., 1/1/2023.

**Kathryn Osterholm Graham**, Pittsburgh, Pa., 12/3/2022.

**James B. "Red" Henderson**, Trap- hill, N.C., 2/16/2023.

**Maureen "Reen" Lathrop**, Landis- ville, Pa., 8/29/2022.

**R. Craig Wood**, Gainesville, Fla., 11/24/2022.

## '79

**Elizabeth Robertson Honea**, Pe- tersburg, Va., 12/1/2022.

**Wayne L. Hurt**, Roanoke, Va., 1/21/2023.

**Laura M. Seager**, Cottonwood, Ariz., 9/25/2022.

## '80

**James "Terry" Slater**, Bridgewater, Va., 10/28/2022.

## '82

**Kathryn G. "Kitty" Hoback**, Salem, Va., 1/9/2023.

**Judith A. (Mumbower) Rumberger**, Winter Springs, Fla., 11/24/2022.

————— **'83** —————  
**Boots Dilley**, Shady Spring, W.Va.,  
12/26/2022.

**David L. Martin**, Louisburg, N.C.,  
11/14/2022.

**Shawn L. (Powell) Simmons**, Pylesville, Md., 11/11/2022.

————— **'84** —————  
**James D. Couch**, San Antonio,  
Texas, 1/22/2023.

————— **'85** —————  
**James "Michael" McGilligan**, William-  
son, N.Y., 1/19/2023.

————— **'86** —————  
**Fred L. Steffey**, Roanoke, Va.,  
12/26/2022.

————— **'87** —————  
**Jana C. Moore**, Wilmington, N.C.,  
12/26/2022.

**Renee Y. (Stout) Velte**, Odessa, Fla.,  
2/26/2023.

————— **'88** —————  
**Robert "Scott" Quast**, Norfolk, Va.,  
12/5/2022.

————— **'89** —————  
**Hannele K. Feiring**, Cary, N.C.,  
1/14/2023.

————— **'90** —————  
**John D. Clothiaux**, Aiken, S.C.,  
12/26/2022.

**Joanne S. (Ludwig) Greathouse**,  
Sun City, Ariz., 3/12/2023.

**Phillip B. Snapp**, Wytheville, Va.,  
12/12/2022.

————— **'91** —————  
**Elisha A. Harrell**, Chesapeake, Va.,  
10/28/2022.

**Richard C. Hudson III**, Virginia  
Beach, Va., 12/21/2022.

**Gary S. Robinson**, Dowell, Md.,  
2/13/2023.

**Stephen R. Schweickert**, Midlothian, Va., 12/28/2022.

————— **'92** —————  
**Daniel W. DeVilbiss Jr.**, Roanoke,  
Va., 11/2/2022.

————— **'93** —————  
**Robert B. Bader**, Oakland, Calif.,  
3/19/2023.

————— **'94** —————  
**Todd A. Goodling**, Seven Valleys,  
Pa., 1/24/2023.

**Jennifer K. McCarthy**, Pulaski, Va.,  
11/30/2022.

————— **'95** —————  
**Jason S. Mullins**, Ferrum, Va.,  
2/2/2023.

————— **'96** —————  
**Alice Moore Waddell**, Lexington,  
Va., 11/8/2022.

————— **'98** —————  
**Susan Cougill Beverly**, Virginia  
Beach, Va., 3/14/2023.

**George W. Lester IV**, Cornelius,  
N.C., 2/27/2023.

**Heather Y. Slivka**, Denver, N.C.,  
2/18/2023.

**Jennifer Wingfield Johnston**,  
Palmyra, Va., 12/18/2022

————— **'99** —————  
**Diana F. Embrey**, Friendswood,  
Texas, 11/11/2022.

**Billie Jean (Kirk) Huskey**, Pem-  
broke, Va., 3/5/2023.

————— **'00** —————  
**Andrea K. (Yardley) Thornberry**,  
Corvallis, Ore., 12/18/2022.

————— **'09** —————  
**Michael J. Gabler**, Manasquan, N.J.,  
11/6/2022.

————— **'10** —————  
**Marisa N. Maldonado**, Midlothian,  
Va., 1/16/2023.

————— **'11** —————  
**Gordon "Tyler" Wright**, Leesburg,  
Va., 6/5/2022.

————— **'13** —————  
**Michelle L. Trice**, Glen Allen, Va.,  
11/28/2022

————— **'14** —————  
**Ian B. Dransfield**, Union, W.Va.,  
12/8/2022.

**Peter G. Wakim**, Arlington, Va.,  
12/9/2022.

————— **'15** —————  
**John J. Peake**, New Bern, N.C.,  
12/22/2022.

————— **'18** —————  
**Sarah K. Wellford**, Blacksburg, Va.,  
10/29/2022.

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## OBITUARIES

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### NOTABLE ALUMNI

**Joseph H. Barlow Sr.** '50, Suffolk, Va., who served as a member of the Virginia Tech Board of Visitors from 1992-95, died April 27.

After earning a bachelor's degree in agricultural engineering, Barlow worked as a territory manager for John Deere and later served in the U.S. Air Force. In 1959, he purchased Cotton Plains Farm near Chuckatuck, Virginia, where he raised peanuts, corn, soybeans, cattle, and hogs.

In addition to his successful career as a farmer, Barlow was actively involved in his community, serving as president of the Virginia Board of Agriculture and Consumer Services, chairman of the Suffolk School Board, First Citizen of Suffolk, governor of the Jamestowne Society, and on the Suffolk City Council.

Barlow along with his wife, Lynn, were members of the university's Legacy Society, the Tidewater Agricultural Research and Extension Center Leadership Council, and Hokies for Higher Education. He also served as class chair for the Virginia Tech Corps of Cadets, on the Virginia Tech Alumni Association board of directors, and on the Cornerstone Alumni Advisory Board.

**Archie Phlegar** '52, M.S. '74, Ed.D. '78, Blacksburg, Virginia, who was director of Virginia Tech admissions during a time of profound growth and diversification of the university, died March 30.

Phlegar earned his bachelor's degree in agricultural engineering in 1952 as well as a commission into the U.S. Air Force, having been a member of the Virginia Tech Corps of Cadets and the



Hightly-Tighties. He served in the Korean War and then returned to his home region to work at the Appalachian Power Co. based out of Bluefield, West Virginia.

Phlegar was a highly engaged volunteer in the university's Alumni Association and was recruited by then Dean of Admissions Mike Lacy to return to Virginia Tech and work in admissions. Phlegar started as an assistant director in 1967 and eventually directed the office. Toward the end of his career, he left admissions to oversee operations for the university's fundraising office, then known as University Development.

## FACULTY/STAFF

**Glen Irving Earthman**, associate professor emeritus of educational leadership, died March 26. Earthman served as a professor at the university for 46 years and also advised doctoral students, chairing more than 80 doctoral dissertations for students during his tenure. He was recognized internationally for his expertise in the areas of school building condition and student and teacher attitudes and performance. In 2015, Earthman was named Researcher of the Year by the Virginia Educational Research Association.

**George A. Hagedorn**, professor emeritus in the Department of Mathematics, died March 4. Hagedorn joined Virginia Tech in 1980 and received 32 years of National Science Foundation funding for his research, which focused on molecular dynamics and work related to Born-Oppenheimer equations. He also served as director of the Center for Statistical Mechanics, Mathematical Physics, and Theoretical Chemistry. Hagedorn published more than 70 papers and presented his work in more than 100 lectures in 18 countries on five continents. He was nominated for the American Physical Society's Dannie Heineman Prize in Mathematical Physics and was a member of the American Mathematical Society and the International Association of Mathematical Physicists.

**Siegfried M. Holzer**, Alumni Distinguished Professor Emeritus of civil and environmental engineering, died March 22. Holzer was known for his expertise in finite element analysis of structures, nonlinear analysis of structures, and multimedia in instructional design. He joined the Virginia Tech faculty in 1972, building his career over the next 30 years. He earned several awards to recognize his classroom commitment, including the State Council of Higher Education's Outstanding Faculty Award and the Chi Epsilon National Teaching Award. He also received numerous Virginia Tech honors, including the Sporn Award for Excellence in Teaching of Engineering Subjects, the William E. Wine Award for Teaching Excellence, the Diggs Teaching Scholar Award, and the Faculty Achievement Award for Excellence in Civil Engineering Education.

**Michael Anthony Ogliaruso**, professor emeritus of chemistry, died Feb. 11. He joined Virginia Tech as an organic chemist in 1967, rising through the academic ranks to serve as an associate dean of what was then the College of Arts and Sciences. Before retiring in 1996, he co-authored more than 50 scientific papers, two books, and several book chapters. He was inducted into Virginia Tech's Academy of Teaching Excellence in 1979 and won the university's William E. Wine Award for Teaching Excellence in 1984.

**Jerry "Dan" Swafford**, project associate and curriculum specialist for Virginia Cooperative Extension, died Jan. 4. Swafford was instrumental in developing and implementing innovative STEM programming and research. In 2011, he received the Outstanding Service Award from the Virginia Association of Agricultural Educators and in 2020, was inducted into the Virginia 4-H All-Stars.

**Helen B. Williams**, administrative assistant in Virginia Cooperative Extension's Amherst County office, died March 11. One of Virginia's longest-serving state employees, she joined Extension in 1957.



Matt Holt

Menah Pratt

# END NOTE

'PAY IT FORWARD'



AS A LAND-GRANT INSTITUTION, Virginia Tech was founded to provide educational opportunities to anyone in the Commonwealth of Virginia who wanted to learn. That mission has not changed. What has changed is that higher education has grown more difficult to access and more expensive.

Following the identification of access and affordability as leading strategic priorities for the university by Virginia Tech President Tim Sands and the Board of Visitors in 2022, Sands launched the Virginia Tech Advantage, which seeks to ensure that a Virginia Tech experience is financially within reach for undergraduate students in Virginia.

Sands named Menah Pratt, vice president for strategic affairs and diversity, and Matt Holt, professor and head of the Department of Agricultural and Applied Economics, to lead the effort. Their personal experiences have helped shape their commitment to the initiative.

## MENAH PRATT'S STORY

As an undergraduate student at the University of Iowa, I became independent from my parents after my first year. I worked several jobs, including as a waitress at Golden Corral, as a tutor for Upward Bound (a program for underrepresented and underserved high students), an office worker in the Student Support Services office, an orientation guide, and a counselor at an after-school program in Cedar Rapids, Iowa, for Black sixth grade girls.

I was working almost 30 hours a week and taking at least 18 hours of coursework a semester.

Approaching my last year, I ran out of money and couldn't pay tuition. After going to all the offices that I thought could help, I was without options. I shared my predicament with the director of the Honors Program, Professor Sandy Barkan. She loaned me \$5,000 and told me to pay her back whenever I could, even if it was just \$5 a year.

It took me some time to pay her back, but I did.

My experience with affording college was similar to my mother's experience in the 1950s. She was getting her master's degree at Indiana University School of Social Work and ran out of money. She petitioned P.E.O., an organization dedicated to supporting women in education, for support. After learning from the dean of the college that she did not qualify for a scholarship because she was Black, my mother sat crying in a hallway. A secretary stopped to ask what was wrong, then wrote a personal check to my mother from her own pocket.

My mother remembered her kindness and made a decision to pay it forward.

Eventually, my mother became a professor of social work at Illinois State University, and in 1993, she created a fund—the Mildred Pratt Student Assistant Fund—“to provide financial assistance to currently enrolled ... students experiencing temporary financial hardship or need.”

My mother's experience and my own are two examples of financial challenges that students face while pursuing education.

Emergency funds are transformational in the lives of economically vulnerable students, enabling them to continue their education, graduate, and pursue their dreams. It is a privilege to be working on this initiative for current and future students at Virginia Tech.

## MATT HOLT'S STORY

As a first-generation student who worked part-time throughout college and received Pell grants, I understand the challenges students from under-resourced backgrounds face. Growing up on a family farm, I understood the meaning of hard work and sacrifice. And because of the values instilled by my family and community, I had the resilience to eventually earn my bachelor's degree from a land-grant institution. But it was never easy. And it was not a linear path.

I also understand the challenges students face when thinking about a meaningful internship experience. As an undergraduate, I spent every summer working as a farmhand or in construction. I never had an internship. In fact, I did not even apply for one. I could not envision a

world outside of farm and construction work—my perspective was limited and, truthfully, I was scared. I felt confident I could earn the money I needed by working long hours on the farm or in construction. Even though many years have passed, I believe that many first-generation students face similar concerns and constraints today.

The path to earning my undergraduate degree was facilitated by great academic advisors and faculty members who took a direct interest in me. Although I thought little about it then, I would constantly bother the professors teaching the classes I took during their office hours. In every instance, they were kind, generous, and took the time to know me as a person, not just another “face in the crowd.” Over time, several of them gently but persistently encouraged me to consider graduate school. In retrospect, they saw a potential in me that I didn't know existed. Without such coaching, my life and career could have gone in a much different and likely, less desirable direction.

I am profoundly honored to play a role, along with Menah Pratt, in launching the Virginia Tech Advantage. You might say I am motivated to pay it forward. I can never begin to repay those who created and sustained an environment where I could achieve my fullest potential. My fondest wish is that Virginia Tech Advantage will stand as a shared, lasting commitment to the land-grant mission—unleashing human potential regardless of income or socioeconomic status. ■

CHANGE SERVICE REQUESTED



**MOSTLY FREQUENT, VERY SKETCHY**  
**Doodles**  
AT THE END OF THE MAGAZINE

**WHY STUDY MICROPLASTICS**

**MEGA PLASTICS ARE TOO BIG!**  
-WHOA!  
HOUSTON, WHERE'D WE PUT THE MEGA-SCOPE?

**MICRO-ECONOMICS WAS TAKEN**  
I THINK I'M IN THE WRONG CLASS.

**WHO EVEN KNOWS ABOUT MICROFICHE ANYMORE?**  
EXCUSE ME... HOW DO I GET THIS ON MY PHONE?

**ONE WORD... "PLASTICS"**

**NANO PLASTICS ARE CUTE. (JUST TO SELL MERCH!)**

**WHAT?! MYTHICAL CREATURES USE SPOONS!**  
GLITTER OATS

**YOU SHOULD HAVE GONE BEFORE WE LEFT!**

**BECAUSE MICRO-MICRO-MICRO PLASTICS REQUIRES QUANTUM TRAVEL. UNICORNS NEED TO EAT TOO!**