

# OUTLOOK

 College of Science  
and Technology

FALL 2024



  
**FIRST  
GEN**



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**Make a gift to the Dean's Scholarship Fund at [giving.temple.edu/givetocst](https://giving.temple.edu/givetocst). Or contact Kathleen McGady, Assistant Dean for Development and Alumni Affairs, at [kathleen.mcgady@temple.edu](mailto:kathleen.mcgady@temple.edu) or 215.204.4704.**



## OUTLOOK

Fall 2024

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Cover photo by Joseph V. Labolito



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## Message from Miguel A. Mostafá

My first year as dean has been extraordinary. Every day, I see the remarkable dedication and enthusiasm of students, faculty and staff here at the College of Science and Technology.

From the advanced work of our six departments and 14 research centers and institutes to community initiatives like the George Washington Carver Science Fair to college programs that offer talented students real-world research experiences, CST's impact reaches across the university, into local neighborhoods and around the world.

Our faculty and students are passionate about what they do. It's a joy to share their successes through *Outlook* magazine, an expanded social media presence, college events and email newsletters.

Following packed recruitment events, in fall 2024 we welcomed the largest group of first-time freshmen in the past decade. In fact, our college accounted for more than twenty percent of total applications and of total deposits of the university during the most recent recruitment cycle.

In recent faculty hiring, CST welcomed a talented and diverse group of researchers. We were able to attract the top candidates in all three searches for tenured and tenure-track positions! In FY24 fundraising, CST reached a historical record of more than \$6M to support scholarships, faculty and programs.

To steer the college toward future success, we expanded the roles of the associate deans to include areas such as postdoctoral affairs, faculty advancement, research innovation and technology commercialization. A refreshed Dean's Advisory Committee, along with new members on our Board of Visitors, are shaping the future trajectory of CST as we navigate the opportunities and challenges that lie ahead.

We set ambitious goals for our college, such as elevating our research profile by increasing resources for advanced investigation and exploration across departments. We will enhance ties with industry, government and academic institutions to expand opportunities for students and faculty. We aim to lead the charge in reimagining education for the 21st century by integrating innovative teaching methods, technologies and curricula that prepare students for success.

Another important priority is strengthening alumni engagement by creating more opportunities for CST graduates to participate in mentorship, networking and philanthropic efforts that are vital to our long-term success.

Thank you for your continued dedication to the success of CST students, faculty and community initiatives. Working together, we will continue the college's mission to celebrate innovation and discovery at every level, build and embrace a diverse scientific community, seek to impact and improve our world, and inspire and empower the next generation of great scientists.

Cheers,

Professor Miguel A. Mostafá  
*Dean, College of Science and Technology*



# Meet CST's newest Goldwater Scholar

by Lindsay Hargrave



As a computer science major, Andrew Tran is captivated by robots and AI.

Tran's dedication to AI research helped earn him a Goldwater Scholarship, one of the oldest and most prestigious national scholarships in the natural sciences, engineering and mathematics in the United States. It is awarded to college sophomores and juniors based on their research merit and promise as a future researcher. Since 2018, eight Temple University students have earned a Goldwater Scholarship, with six having a CST major or minor.

Tran's research has been performed under the leadership of Assistant Professor of Computer and Information Sciences Stephen MacNeil in the Temple University Human-computer Interaction (HCI) Lab.

"Andrew's achievements, including over 400 citations, are impressive. However, these statistics only scratch the surface of his true influence on our lab, department and fellow students," MacNeil said.

Tran's research with the HCI Lab examines new generative AI models such as ChatGPT.

His work specifically focuses on the use of these models in the computing classroom, and answers questions such as, "How can students use these models to improve their learning?" and, "How can instructors use these models to improve their pedagogies?" Tran hypothesizes that some of these AI models may even replace search engines in educational settings someday, and that this research will impact classrooms very soon.

"The HCI lab overall has an amazing and very welcoming environment. Students get to solve real-world problems through an approach to thinking they might not encounter in the computer science classroom," Tran said. "The biggest highlight of my computer science career at Temple is my time with the lab."

In the future, Tran would like to delve into topics such as embodied AI, which is the concept of AI systems incorporated into physical forms like robots. "Andrew's collaborative nature and ability to advise peers affirm his potential to become a world-class researcher—someone who elevates those around him, a quality the scientific community direly needs," MacNeil said.



*Andrew's achievements, including over 400 citations, are impressive. However, these statistics only scratch the surface of his true influence on our lab, department and fellow students." - STEPHEN MACNEIL*



PHOTO: CONNOR MCVAIL





PHOTOS: KELLY & MASSA

## Celebrating the Class of 2024

by Greg Fornia

On May 9, the College of Science and Technology held a graduation ceremony for the Class of 2024 inside The Liacouras Center. More than 800 graduates earned bachelor's, master's, professional science master's and doctoral degrees in 2024.

The ceremony began with a welcome from Dean Miguel Mostafá. In his first graduation remarks since joining the college, he encouraged graduates to remember the lessons learned at the college and to "embrace the unknown with open minds and open hearts, knowing that every obstacle we encounter is an opportunity for growth and every setback is a steppingstone to success. But above all, let us never forget the power we hold to make a difference in the world."

The keynote speakers were Elana McDonald, CST '96 and Delana Wardlaw, CST '96, twin sisters and accomplished physicians in the Philadelphia region. In 2020, McDonald and

Wardlaw created the Twin Sister Docs organization, which focuses on health, wellness and encouraging patient self-advocacy.

The student speaker was Taylor Forry, CST '24, who graduated with a bachelor's in neuroscience: cellular and molecular, a minor in psychology and a certificate in American Sign Language. She now attends the Drexel University College of Medicine.

The official conferral of degrees was conducted by Paul G. Curcillo II, MD, CST '84, a member of the Temple University Board of Trustees and CST Board of Visitors.

Michael Remaker II, CST '06, president of the CST Alumni Board, welcomed the new graduates into the alumni community and urged them to "get involved, stay involved" with CST and future students.

Learn more about the Class of 2024 at [cst.temple.edu/Classof2024](https://cst.temple.edu/Classof2024).



# Helping African nations combat deadly new malaria strains

by Jonny Hart

PHOTO: CONNOR MCVAIL

**M**aciej Boni, a biology professor who joined CST in January 2024, works with Rwanda, Tanzania and Uganda to design strategies to slow down a growing drug resistance in malaria.

An internationally recognized evolutionary epidemiologist, Boni's work investigates how diseases evolve during epidemics. His lab is one of just a handful of labs in the world conducting the kinds of highly specialized disease modeling that can help African countries develop strategies to slow down drug resistance in malaria.

Slowing down malaria's drug resistance can be done by extending the period that a patient receives artemisinin, deploying multiple drugs in combination with artemisinin or treating patients with a different drug entirely, among many others.

Boni and his team are using an advanced computing cluster to run thousands of simulations that test the effectiveness of different strategies in African countries. These results are shared with a country's national malaria control program (NMCPs) to help design and implement effective strategies.

Modeling drug resistance in malaria is tricky because malaria has developed multiple mutations to not just artemisinin, but to other treatment drugs. To accurately model the progression of drug resistance, simulations must account for as many of these mutated malaria genotypes as possible. Accounting for those mutations is what sets apart Boni's lab from the few other modeling teams around the world doing similar work.

"There are now probably 20 to 30 mutations in malaria parasites that have been identified and characterized as having important effects on drug resistance, which means that there are millions of mutational combinations (or genotypes) out there," Boni said. "We have done all of the legwork over the last five to six years to define the parameters of tens of thousands of these genotypes, and they're all in our simulation."

Rwanda is expected to begin implementing drug resistance strategies soon. Boni's team is currently running simulations for Tanzania and Uganda, and he is in conversation with other African countries as well.



PHOTO: JOSEPH V. LABOLITO

## ANTONIO GIORDANO EARNS GOLDEN LION AWARD

Antonio Giordano, director of the Sbarro Institute for Cancer Research and Molecular Medicine, received Italy's Golden Lion for Legality award for his research that demonstrated the connection between the illicit landfiling of waste and tumor pathologies in the Campania region. The award represents recognition for scientific research on cancer and for the courage to have revealed the links between waste management, controlled by organized crime, and the incidence of cancer in the Campania region.





PHOTO: JOSEPH V. LABOLITO

## NEW SUSTAINABILITY PROGRAMS WILL HELP TACKLE GLOBAL ISSUES

by Deirdre Childress Hopkins

The College of Science and Technology and College of Liberal Arts introduced a new professional science master's and graduate certificate in sustainability as part of a broader effort to establish a Sustainability and Environmental Justice Collaborative between the two colleges.

The new degree and certificate program are designed to meet the needs of employers seeking highly trained leaders. The field is rapidly growing, with increasing demand for professionals who can integrate sustainability principles into business, government, non-profits and academia.

Students can take courses in one of five concentrations, including biodiversity and conservation, urban sustainability, energy systems and natural resources, climate justice, and geospatial technologies. The program emphasizes professional development and communication skills, policy and ethics, understanding complex systems and the ability to collaborate across fields and stakeholders.

Along with faculty from the College of Liberal Arts, CST's Department of Earth and Environmental Science, the PSM Steering Committee includes Biology's Erik Cordes and Rob Jennings. Jennings will be a co-director of the program, working with an external advisory board of representatives from the Pennsylvania Department of Environmental Protection, National Oceanic and Atmospheric Administration and other agencies.



PHOTO: GREG FORNIA

## INVESTIGATING MICROBIAL SYMBIOSIS

by Greg Fornia

Previously a research scientist at the California Academy of Sciences, Alison Gould joined the Biology Department in summer 2024 as an assistant professor. Gould's work seeks to identify key mechanisms regulating the specificity and stability of microbial symbioses from an evolutionary scale down to the molecular level.

As a postdoc at University of California, Berkeley, Gould investigated microbial symbiosis in the *Drosophila melanogaster* gut microbiome and was lead author on a study published in Proceedings of the National Academy of Sciences that quantified the effects of symbiont interactions on host fitness. She received a National Institutes of Health Director's Early Independence Award to launch her lab and further develop the *Siphania-Photobacterium* symbiosis as a vertebrate-bacteria model for symbiosis research.

Gould's lab investigates an experimentally tractable symbiosis between a coral reef cardinalfish and a luminous bacterium. "All organisms are dependent on microbes for their success, yet very little is known with respect to how these essential symbiotic partnerships form and persist through time," she said. "My ultimate goal is to help untangle the complexities underlying beneficial host-microbe interactions and, in doing so, provide the research community with a powerful new vertebrate model for symbiosis research."

## CLIMATE CHANGE MAJOR CAUSE OF AMPHIBIAN DECLINE

by Bruce E. Beans

Professor S. Blair Hedges is part of a major study by more than 100 researchers that shows climate change is a major driver of amphibian declines globally.

Habitat destruction and disease are both well-documented causes of the decline of amphibians—among the most threatened animals on the planet. The study, which analyzes two decades' worth of data from around the world, concludes that climate change is emerging as one of the biggest threats to frogs, salamanders and caecilians.

"This work demonstrates how another major group of organisms on Earth is declining because of human impact," said Hedges, director of the Center for Biodiversity and a Laura H. Carnell Professor. "Our evidence shows that climate change is an emerging threat."

According to the study, published in *Nature*, nearly 41% of amphibian species assessed are currently globally threatened, critically endangered, endangered or vulnerable—compared to 26.5% of mammals, 21.4% of reptiles and 12.9% of birds.

Conservationists will use information from the study to prioritize global conservation action, seek additional resources and influence policy to reverse the negative trend for amphibians.





PHOTO: JOSEPH V. LABOLITO

## A Fulbright and PhD program await Diana Tiburcio

by Lindsay Hargrave

**D**iana Tiburcio, ENG '24, is headed to Stanford University to earn a doctorate in chemical engineering. The first woman of color from Temple to receive a Goldwater Scholarship, the chemistry minor and mechanical engineering major is first participating in a 10-month Fulbright at the Max Planck Institute for Chemical Energy Conversion.

In high school, Tiburcio was guided by her fencing coach Tasia Ford, who was making the move from coaching high school to coaching at Temple. Tiburcio made the decision to follow in the footsteps of her coach (a Temple alum), and came to Temple as a student-athlete in STEM.

Tiburcio's favorite faculty member is the chair of Chemistry. "Ann Valentine has been an incredible mentor throughout all four years at Temple," Tiburcio said. Tiburcio entered college hating chemistry, but taking

Valentine's General Chemistry class completely changed her mind. She went on to work in Valentine's inorganic lab, where she characterized how proteins react with metals such as iron and titanium.

Tiburcio fell in love with scientific research after becoming involved with research-focused groups like MARC (Maximizing Access to Research Careers) and Engineers Without Borders. Through these student organizations, she found camaraderie and projects to work on. She participated in the GREEN program in Peru to study water resource management and sustainability, with a focus on indigenous practices.

"I decided that I wanted to pursue a career in research, and Temple really gave me those opportunities as an R1 institution. I'm really grateful for everything that Temple provided me: the fellowships, the advising and fencing."



PHOTO: CONNOR MCVAIL

### CHEMISTRY GRADUATE STUDENTS LEAD ACS SYMPOSIUM

by Greg Fornia

Chemistry graduate students Zachary O'Dell, Tipsiri Pungsrissai and Sanjay Sridhar, in collaboration with students from other universities, organized the Graduate Student Symposium at the 2024 American Chemical Society Spring National Convention.

The theme, Nanoparticle Heterogeneity, Realizing Strengths by Embracing the Differences, was centered around the work of the National Science Foundation Center for Single-Entity Nanochemistry and Nanocrystal Design, a partnership among Temple, led by Professor Kallie Willets, and Indiana University, Texas A&M University and University of Texas at Austin. All three students work in the Willets Lab, where research is focused on plasmonic nanoparticles and how they interact with light.

"The symposium's goal was to connect scientists from various disciplines of nanomaterial research to better understand and control heterogeneity in metal nanoparticle samples," explained O'Dell, who chaired the symposium.

Sridhar's role was managing logistics, including drafting the schedule and managing technology. As speaker liaison, Pungsrissai communicated with invited researchers. "This symposium was a great opportunity to meet and talk about science to big names in the research field," said Pungsrissai. "I guess it's like seeing your idols in person."

## CHEMISTRY'S HERB BASSOW DEMO DAY

by Greg Fornia

The Herb Bassow Demo Day, a longstanding collaboration between the Chemistry Department and Philadelphia Section of the American Chemical Society, offers middle and high school students opportunities to experience what it's like to be a scientist.

Inspired by the Royal Society of Chemistry Christmas lectures, the most recent event attracted approximately 300 students from five Philadelphia public and private schools, including Carver High School for Engineering and Science and St. Joseph's Preparatory School.

Co-organized by Daniele Ramella and Jaskiran Kaur, both associate professors of instruction, each event consists of faculty demonstrations, such as making liquid nitrogen ice cream, and hands-on activities like decorating t-shirts using chromatography.

Additional activities include marshmallow inflation, to learn about pressure and volume, and balloon on a stick, to explore polymer structure. "Students come with different levels of understanding of chemistry," said Kaur. "Some are excited to see demonstrations of the concepts they learned in their classes and others are excited to learn new concepts. There is something for everyone."

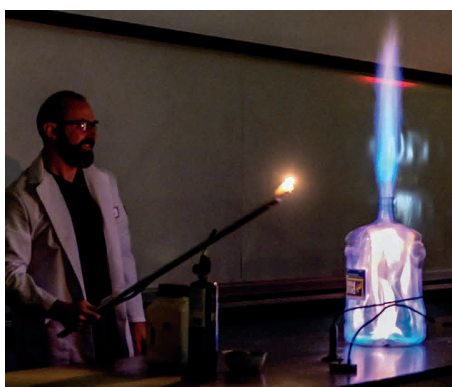


PHOTO: RYAN S. BRANDENBERG



## CAROL MANHART: TEMPLE TRAILBLAZER IN STEM

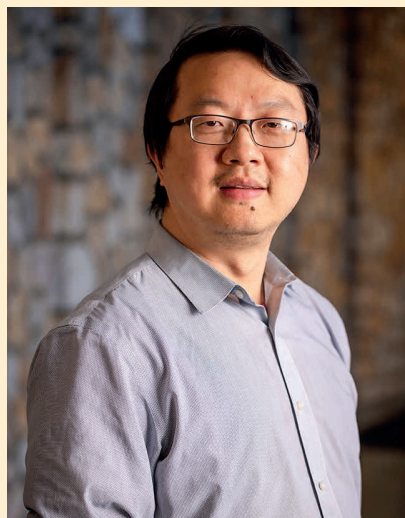
by Jonny Hart

Carol Manhart, assistant professor, was featured as a Temple trailblazer in STEM, celebrating accomplished women researchers. Manhart's focus is using biochemistry to understand how errors are corrected during the DNA copying process. Her research has been published in journals such as *Nucleic Acids Research*.

Growing up, Manhart was curious about how things worked. Watching her dad fix a door, Manhart was captivated by the deadbolt lock, and felt a strong desire to dismantle it to get a better understanding of how it works.

That sense of wonder intensified during college, particularly as she took more biology courses. Today, her work focuses on how proteins interact with DNA to correct errors and predict the likelihood of acquiring a cancer associated with a defective protein.

"To women aspiring to excel in STEM fields, I would strongly recommend seeking out mentors and sponsors," said Manhart. "It is crucial to connect with individuals who can provide guidance and support, as well as advocate for you to flourish in your career."



## RISING STARS IN CHEMISTRY

Associate Professor Ross Wang was named a 2024 Rising Star in Biological, Medicinal, and Pharmaceutical Chemistry by *ACS Bio & Med Chem Au*, an open-access journal of the American Chemical Society. Wang was selected based on his outstanding record of accomplishment and future promise. Associate Professor Sarah Wengryniuk was named a Rising Star by the American Chemical Society Women Chemists Committee, recognizing exceptional early to mid-career women chemists across who have demonstrated outstanding promise.

# Machine learning building ALERT system for power outages

by Greg Forna

**Z**oran Obradovic, Laura H. Carnell Professor of Data Analytics, and his research partners are collecting historical outage data, weather-related data and other types of ‘big data’ and then using advanced machine learning to make predictions on when and where power outages will occur.

Called ALERT: Advanced Learning for Energy Risk Tracking, the National Science Foundation-funded initiative looks to develop an early warning prototype and outage prediction model. Utility companies will be much better prepared to minimize outages and even prevent catastrophic events like total blackouts. Consumers would have earlier access to important—and potentially lifesaving—information.

“We are building a system that is learning from multiple sources, and this type of multimodal learning is where its power lies,” said Obradovic, who is also director of CST’s Center for Data Analytics and Biomedical Informatics. “In the ongoing NSF-funded

project and our related project supported by the U.S. Department of Energy (DOE), we collect large data sets related to weather, weather forecasting, power generation, consumer use of energy, substation failure and information from phasor measurement units.”

Research collaborator on the ALERT project include faculty from Texas A&M University, the University of Texas at San Antonio and the University of Houston. CST graduate students working on the NSF and DOE projects include Hussain Otudi and Daniel Saranovic.

“There are so many layers of information, and so many ways that a down electrical grid overlaps with, for instance, people’s access to water, and other systems,” said Obradovic, who cited a cold snap in Texas a few years ago where earlier and better predictions might have prevented both loss of life and damage to infrastructure. “Our system is called ALERT because it’s about giving utility companies and people the information needed to be proactive, before the power goes out.”

## OWLHACKS ORGANIZERS HOST TAPIA HACKATHON WORKSHOP

CIS students Chiku Okechukwu, Egi Rama and Andrew Tran presented a workshop at the 2024 Tapia Conference, where more than 2,000 attendees gathered to discuss broadening participation in computing. Alongside undergraduate collaborators from the University of Washington, the three shared best practices to help other students kickstart hackathons in their local communities. The three CIS students are part of the team behind OwlHacks, Temple’s annual, student-organized hackathon. First hosted in 2019, this year’s OwlHacks attracted more than 275 participants.



## NEW CIS CHAIR

by Greg Fornia

Yu Wang was named CIS chair, effective July 1, 2024. Wang joined the department in 2019 and served as director of graduate programs for four years.

Wang, who earned a PhD in computer science from Illinois Institute of Technology, has research interests in wireless networks, smart sensing and distributed computing. Current projects include developing efficient resource management schemes to support edge intelligence and creating mobile smart sensing systems with multi-modalities to perform fine-grained sensing tasks for security and health applications. With more than 300 papers in peer-reviewed forums, his research has been continuously supported by NSF, Department of Transportation and Microsoft.

An IEEE Fellow and ACM Distinguished Member, Wang is a recipient of Sigma Xi Award from Illinois Institute of Technology, Ralph E. Powe Junior Faculty Enhancement Awards from Oak Ridge Associated Universities and IEEE Benjamin Franklin Key Award.

"I am committed to fostering an environment of innovation and cutting-edge research," said Wang, "and enhancing student success with hands-on experience, industry exposure, and opportunities to work on real-world problems alongside our faculty."

As chair, Wang follows Jamie Payton, who now serves as dean of New Jersey Institute of Technology's Ying Wu College of Computing.



## AN INCREDIBLE EXPERIENCE AS GOOGLE INTERN

by Stephen Orbanek

For two summers, Prince Geutler, CST '24 interned with Google, helping their Cloud Division by developing software that gathers server performance metrics within the company's massive server infrastructure.

"This has just been an incredible experience," said Geutler. "Within the internship, you get great mentorship from all of the engineers around you, and everybody is very, very helpful. They have great insights, and I feel so confident now as I move forward."

According to Geutler, each intern is assigned a major project during a summer internship at Google. "I was working on the boot process of Google servers, which is basically the start up of a Google server. So you can kind of compare that to the process that occurs when you press the on or start-up button on your laptop or phone," Geutler said.

Geutler knows Temple prepared him for success. "One class that really helped me was Data Structures taught by Andrew Rosen, associate professor of instruction. Technical interviews at Google are oftentimes all about data structures, and I felt like Dr. Rosen did a tremendous job," Geutler said.

As of July 2024, Geutler is a full-time software engineer with Google.



## IMPROVING SOFTWARE FOR SCIENTISTS

by Greg Fornia

Sian Jin is an assistant professor who joined CIS in January 2024. He earned his PhD in computer engineering from Indiana University in 2023, after receiving his bachelor's in physics from Beijing Normal University.

His research interests include high-performance computing (HPC) data reduction and lossy compression for improving the performance for scientific data analytics and management.

"My background in physics, combined with an interdisciplinary approach, enables me to deeply understand the unique challenges of scientists," explained Jin. "This comprehension allows for the seamless integration of data reduction solutions into scientific applications, significantly boosting their performance."

Within the past five years, he has published more than 20 papers in top conferences and journals, including the International Conference for High Performance Computing, Networking, Storage, and Analysis and EuroSys, the European chapter of ACM SIGOPS (Special Interest Group in Operating Systems).

"My research spans a variety of applications, opening up many collaboration possibilities within CST," said Jin. "For example, I am currently working on NIH proposals with Mindy Shi on sequence data compression and planning NSF and DoE proposals with Xubin He and external partners."

# Saving PennDOT's plants from deadly road salt

by Jonny Hart

PHOTOS: JOSEPH V. LABOLITO

**A**n interdisciplinary team of researchers is investigating the impact of road salt on the plants in bioretention basins along I-95. The project aims to optimize plant health and improve stormwater management.

CST's Laura Toran, a hydrogeologist, is overseeing the Temple research team, which includes faculty and students from CST, College of Engineering and Tyler School of Art and Architecture. To fix the problem of dying plants, Tyler's Josh Caplan and fellow researchers identified the culprit as deicing salt used to treat roads in winter. The Pennsylvania Department of Transportation (PennDot) uses pipes to direct water from I-95 into bioretention basins, and during heavy winters this water becomes highly concentrated with salt.

Temple researchers traced sodium from stormwater through the basin soil and into plant tissue, establishing road salt as the root cause of poor plant health. Plants are the most visible component in bioretention basins, so their health is important for aesthetic reasons. But the basins and their plants also play a key role in the city's stormwater management.

Salt tolerance goes a long way in helping plants survive conditions in the basins. But salt tolerance in plants isn't straightforward.

Working with PennDOT, the team incorporated a test of salt-tolerant species, like hardy hibiscus and seaside goldenrod, used in a redesign of a bioretention basin in Philadelphia's Fishtown neighborhood.

Researchers, including CST's Jonathan Nyquist, are also gathering data on survival, growth and leaf chlorophyll content for more than 450 salt-tolerant plants. That data will

help them understand which plants are best suited for bioretention basins.

The researchers hope the new data will help PennDOT build basins that are better suited for their role in managing city stormwater. "Putting green infrastructure in a city where you've already built your buildings is hard, and that's why people are looking at what we're doing here," Toran said.





PHOTO: CONNOR MCVAIL

## RENDEZVOUS BRINGS GEOSCIENCE EDUCATORS TO TEMPLE

by Greg Fornia

The EES Department hosted the 2024 Earth Educators' Rendezvous, attracting 250 participants from across the country. This year's conference—the first held on the East Coast—included opportunities to explore new pedagogical tools, discuss challenges in the field such as recruiting enough geoscience students to meet the demand of jobs in the next decade, and learning more about Temple's expertise and resources in geoscience and environmental education.

Alexandra Davatzes, associate professor, helped organize the conference, co-led a workshop on understanding the power of feedback loops with regards to environmental challenges and solutions, and co-hosted a field trip for attendees to the Temple Ambler Field Station.

"With the rendezvous on Main Campus, many of our own faculty and students were able to participate and further develop their own teaching practices," explained Davatzes, who is also CST's director of Diversity, Equity, Inclusion and Belonging. "By demonstrating the excellent facilities within CST and showing how we are at the forefront of geoscience education practice, I am hopeful that many of these faculty from around the U.S. will encourage their students to come to graduate school at Temple."

## RESEARCH ASSISTANT EARNS AGRIVOLTAICS DESIGN AWARD

by Greg Fornia

Caroline Merheb, a geoscience PhD student, won the 2024 student design competition at the AgriVoltaics World Conference, where participants develop concepts that address community sustainability challenges across the food-energy-water nexus. Merheb works with Sujith Ravi, associate professor, at the agrivoltaic test site at the Ambler Campus.

AgriVoltaics is agricultural production, such as crop or livestock production, underneath solar panels or adjacent to solar panels. Merheb's design focused on three targets: help cities mitigate the effect of urban heat islands, help poor neighborhoods access fresh food produce and improve the aesthetics of artificial surfaces. The design integrated innovative approaches using vertical farming to enhance the cooling effect of panels from plants and hybrid modes of farming to satisfy the needs of urban farmers.

"The Ambler site represents one of the first pilot projects to investigate the success of combining urban agriculture with urban agrivoltaics design layouts in a temperate climate," explained Merheb. "If the system proves to be productive, urban agrivoltaics has the potential to protect urban crops from extreme heat events, produce decentralized and sustainable energy, secure more diverse job opportunities and generate more revenues."

## USING ROBOTS TO EXPLORE MELTING ICE SHEETS

by Bruce E. Beans and Jonny Hart

Glaciologist Atsuhiko Muto is part of MOTHERSHIP, a \$1.5-million project developing swarms of underwater robots to be sent around the coast of the Antarctic ice sheet to gather vital data.

Ice sheets store roughly two-thirds of the planet's fresh water. Muto says the Antarctic ice sheet holds enough ice to raise the global sea level by nearly 200 feet if it all were to melt.

"It is very unlikely to completely melt," Muto said. "But if a small portion of the ice sheet melted, say, enough to raise sea level by a foot or two, it would inundate much of earth's coastal areas and displace many millions of people."

Muto says most of the current melting of the ice beneath Antarctica is caused by changes in ocean circulation that bring warmer waters to the ice sheet. "Those ocean circulation changes are caused by some human-induced warming in the upper ocean and in the atmosphere, but also by natural climate events such as El Niño," Muto said.

The three-year, NSF-funded MOTHERSHIP project will help determine if marine robots operating in ocean waters underneath Antarctic ice shelves could answer questions about sea-level rise.

One question regards the shape and size of ice cavities underneath the ice shelves. Caused by ocean currents and rising water temperatures, these cavities are miles away from the open ocean and more than 1,000 meters deep, making them difficult to access.

"If successful," says Muto of MOTHERSHIP, "it could enhance our understanding about what is occurring at this critical intersection between the ice sheet and ocean—and provide invaluable data to address global sea-level rise concerns."



# Mitrea earns Faculty Research Award

by Greg Fornia

**I**rina Mitrea, Laura H. Carnell Professor of Mathematics, earned the Temple University Faculty Research Award, which recognizes excellence and major contributions in the recipient's field.

Mitrea's work has been focused on the development of a systematic treatment of second and higher-order elliptic boundary value problems using singular integral operators. With more than 60 research articles and nine collaborative monographs, "her contributions in research have been extraordinary and have established her as a leader in her field," said Miguel Mostafá, CST Dean.

Her research has been also recognized through the 2008 Ruth Michler Memorial Prize from the Association for Women in Mathematics, a Von Neumann Fellowship at the Institute for Advanced Study in Princeton in 2014, and a Simons Foundation Fellowship in 2019. Mitrea has been an American Mathematical Society Fellow since 2015.

Most recently, Mitrea has co-authored an unprecedented five-volume, 5,000-page original research monograph that creates a new track in mathematics. The monograph, titled *Geometric Harmonic Analysis*, represents more than 15 years of research at the crossroads of geometry, mathematics concerned with metric properties of the ambient space, and harmonic analysis, which studies a complex object by decomposing it into simpler building blocks and establishing patterns of behavior.

Mitrea was also profiled by Temple as one of five university women trailblazers in STEM.



*In the Geometric Harmonic Analysis Series we construct new tools, reconcile structures which are characteristic to traditionally distinct branches of mathematics, and build portals between these, through which we can travel back and forth without loss of information."*



## KATRINA MORGAN JOINS DEPARTMENT

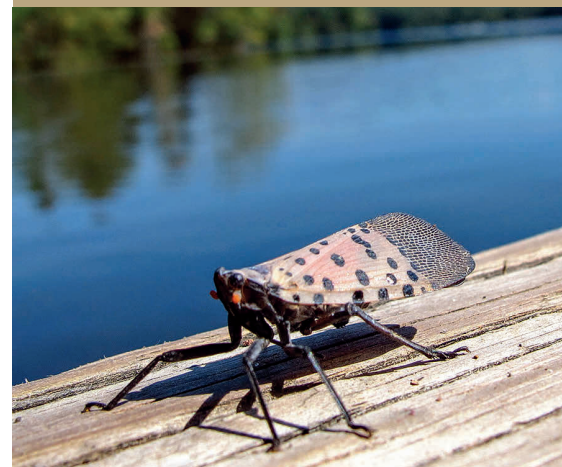
by Greg Fornia

Katrina Morgan joined the Department of Mathematics as assistant professor in fall 2023. Before coming to Temple, Morgan was an NSF postdoctoral fellow at Northwestern University. She has also held a postdoctoral appointment at the Mathematical Sciences Research Institute (now Simons Laufer Mathematical Sciences Institute). She earned a PhD in mathematics from the University of North Carolina at Chapel Hill.

Morgan's main research interest is partial differential equations. "I am interested in understanding how geometry affects the behavior of waves like light and sound," explained Morgan. "Many of the questions I study are motivated by general relativity, which tells us the geometry of the universe is

affected by massive objects. This in turn affects how light moves through the universe. I use techniques involving Fourier Theory to study the differential equations modeling light waves."

In 2016, Morgan co-founded Girls Talk Math, a free summer day camp for high-school students hosted annually at UNC-Chapel Hill. Students work in groups on a challenging STEM problem set and research the life and work of a scientist from a marginalized group. Student teams then produce a blog post about the math they learned and write and record a podcast about the scientist they researched. The camp expanded to the University of Maryland in 2018, Worcester Polytechnic Institute in 2022 and then to Wake Forest University in 2024.



## MODELING THE SPREAD OF SPOTTED LANTERNFLIES

by Jillian Kunze

Professor Benjamin Seibold and graduate student Jacob Woods presented at the 2024 SIAM Conference on the Life Sciences, sharing their research on mathematically modeling the spread of spotted lanternflies.

"I'll be highlighting our work with ecologists to understand the spotted lanternfly," Seibold began. "We want to understand their behavior so that stakeholders, like the U.S. Department of Agriculture, can perform interventions." Seibold created a principled mathematical model of the life cycle of spotted lanternflies to explore whether they would be able to establish themselves in particular locations given the local climatic conditions, and calibrated the model based on laboratory and field data.

Woods discussed nuanced principled models of spotted lanternfly movement that could help stakeholders determine the best methods to control them. "I'm going to be focusing on spatial spread," Woods said. "I'm really curious about the geometry of what's happening in the real world."

Contributing to the research were Biology's Matthew Helmus, Jocelyn Behm and Sebastiano De Bona as well as support from the U.S. and Pa. Departments of Agriculture. A longer version of this article originally appeared in *SIAM News* on 6/12/24, available at [www.siam.org/publications/siam-news/](http://www.siam.org/publications/siam-news/).

## SK DAY FOR GIRLS RETURNS

by Greg Fornia

Sonia Kovalevsky Mathematics Day for Girls (SK Day) welcomed 31 middle schoolers for a Saturday filled with fun mathematical games. The event, now in its tenth year, was last held virtually in 2021.

The program focuses on providing middle school participants with engaging mathematical instruction and mentorship by female Temple students in STEM disciplines.

The day is organized by Maria Lorenz, professor of instruction and associate chair, Beca Lufi, assistant professor of instruction, and Irina Mitrea, Carnell Professor of Mathematics. Additional support was provided by Jaclyn Lang, assistant professor, Andrew Eisenberg, assistant professor of instruction, Sophia Blakely, graduate student and Nora Melican, undergraduate student.

"Many thanks to the volunteers, high school students and teachers, undergraduate students, graduate students, and faculty, that made this day such a success," said Lorenz.



Kovalevsky was the first woman in modern Europe to obtain a doctorate in mathematics and first woman to be appointed professor of mathematics, among other firsts. The long-term goal of SK Day is to impact the way young women view mathematics as a discipline while strengthening their mathematical skills.

# Thousands gathered on Temple's campus to witness the solar eclipse

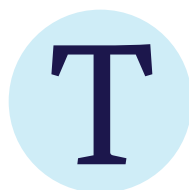
by Jonny Hart

PHOTOS: JOSEPH V. LABOLITO



## BERND SURROW EARNS PRESTIGIOUS CARNELL PROFESSORSHIP

Bernd Surrow has been named a Laura H. Carnell Professor by the Temple University Office of the Provost. Carnell professorships recognize faculty who have distinguished themselves in research, scholarship, the creative arts and teaching. "Receiving the prestigious Carnell Professorship is a significant milestone in my career," said Surrow, whose research focus is investigating the structure of the proton and its underlying dynamics. "It is a testament to the guidance, mentorship and support I have been fortunate to receive over the years."



The Physics Department and CST hosted a viewing event on Temple's Main Campus for the April 8, 2024, solar eclipse, where coverage reached 90% totality. The event featured solar telescopes, free eclipse glasses, a countdown timer to peak eclipse coverage and a livestream capturing the excitement.

Thousands of visitors, both members of Temple community and neighbors, gathered on campus to celebrate the eclipse, which was the first major solar eclipse visible from the Philadelphia region since 2017. Food truck lines were packed, cameras were out, and crowd applause roared through campus as the sun—and the moon—peeked through the afternoon clouds.

More than 1,500 eclipse glasses were distributed, which crowd members used to safely view the spectacle. Feeds from the telescopes were captured and shared via livestream. A recording of the livestream can be viewed on CST's YouTube channel.

Reporters from *The Philadelphia Inquirer* and *The Temple News* were on campus to cover the viewing party, as was a camera

crew from CBS3 Philadelphia. CBS also tapped into CST's livestream of the eclipse, which the station broadcasted throughout the afternoon.

Temple's very own eclipse expert Associate Professor of Instruction Matthew Newby was also in attendance answering questions about the celestial phenomenon. John Noel, associate professor of instruction, provided technical support. Despite a few clouds in the sky, the crowd made the most of the event, and with good reason. The next time Philadelphia will see a solar eclipse with 90% coverage won't happen until May 11, 2078.



## EXPLORING GUIDING PRINCIPLES OF QUANTUM MATTER

by Greg Fornaia

Jie Wang, a rising scholar with key accomplishments in the physics of matter, will help strengthen Temple's research enterprise in condensed matter physics.

Wang earned his PhD in physics from Princeton University in 2019. Before joining CST in January 2024, he was a research fellow at the Center for Computational Quantum Physics at the Flatiron Institute and then a postdoctoral fellow at the Center of Mathematical Sciences and Applications at Harvard University. Wang's research interests include exotic quantum phenomena in topological matters, their physical origin and experimental implications.

"I am interested in the guiding principle of quantum matter. Nowadays, we know many guiding principles such as symmetry, topology, geometry and anomalies, which constrain and determine phases and dynamics of quantum matter," explained Wang. "I want to understand further their roles in quantum matter and synthetic matter, their interplay, and their consequences and implications in experiments."

Wang was attracted to the Physics Department's strong condensed matter groups. "I'm also interested in exploring interdisciplinary collaborations across different departments, such as machine learning and quantum information," said Wang.



## NEW CHAIR AND VICE-CHAIR TO LEAD PHYSICS

by Greg Fornaia

Effective January 2, 2024, Professor Maria Iavarone assumed the role of Physics Department chair. Iavarone brings with her a strong background in academia, the ability to collaborate and foster new initiatives to enhance the department's standing and a commitment to create an environment that respects and values all individuals.

"Maria is dedicated to mentoring faculty and staff, supporting their professional development and fostering an environment conducive to growth and success," said Dean Miguel Mostafá. "I am confident that she will bring fresh perspectives, innovative ideas and exceptional leadership to guide the department toward continued success."

Associate Professor Martha Constantinou now serves as vice-chair. Constantinou has demonstrated a strong commitment to the department, a distinguished record of teaching, research and scholarly achievements, and the ability to foster collaboration among faculty, staff and students.

Professor Peter Riseborough, who served as interim chair for a year and a half, will return to his research and teaching.

## MARTHA CONSTANTINO: TEMPLE TRAILBLAZER IN STEM

by Jonny Hart

Martha Constantinou, associate professor and Physics Department vice chair, was featured as a Temple trailblazer in STEM, celebrating accomplished women researchers.

Constantinou's research area is using theoretical and computational nuclear physics to learn more about the fundamental particles that make up the visible universe. She serves as lead principal investigator for a U.S. Department of Energy-funded project to study quarks and gluons. The collaboration is a consortium of scientists from 11 universities and three national laboratories.

Constantinou's research has been published in the *Physical Review Letters of the American Physical Society*, the *Journal of High Energy Physics*, *Nature Communications* and the *European Physical Journal*.

"My experience as a woman in STEM has been influenced by a lack of female mentors in academic settings and constant advice to consider alternative career paths," said Constantinou. "Despite these challenges, I am grateful that I persisted in pursuing a career in academia. My message to all women considering a STEM field is to not let fear hold them back from following their passion and carving out their unique path."

## AIDAN COBB EARNS SMART SCHOLARSHIP

Aidan Cobb, computer science and physics sophomore, earned a Department of Defense Science, Mathematics, and Research for Transformation (SMART) Scholarship. The SMART program is a comprehensive initiative offering students full tuition for up to five years, mentorship, summer internships, a stipend and guaranteed post-graduate employment with the Department of Defense. Cobb has been developing software for data analysis with Professor Jeff Martoff's HUNTER Project, which is searching for additional "sterile" neutrinos beyond the Standard Model of particle physics.



# The First-Gen Initiative

by Bruce E. Beans

PHOTOS: DAN Z. JOHNSON

## Tools, tips and community connections to help students—the first in their families to attend college—thrive at Temple and CST

Even though she graduated from renowned Central High School in Philadelphia, Michelle Tanujaya didn't know much about navigating college before the South Philadelphia resident arrived at Temple University as a biology major two years ago.

Tanujaya's father, who drives people to their factory jobs, never attended college. Her mother, who was unable to complete high school, is a machine operator. Her unfamiliarity with higher education was understandable.

Yet, thanks to her participation in the College of Science and Technology's First-Generation Initiative (FGI), this past summer she spent nine weeks in a Brown University research laboratory using zebrafish to study Sox9, a sex-determining gene whose mutations can cause fatal genetic disorders in human fetuses.

"I'm so grateful for the time I was able to spend at Brown growing as a scientist," says Tanujaya, a junior who intends to pursue a PhD in biomedical research.

She credits the FGI director, Frank Nelson, an associate professor of instruction in biology, for some of her success. "Going into college, I felt lost," says the member of Temple's Honors Program. "I didn't know a lot about a lot of things. He helped guide me, encouraged me to network and reach out to juniors and seniors and other professors to figure out what kind of career I wanted to pursue."

### 'FIRST GENS' ARE EVERYWHERE

CST's First-Generation Initiative launched in 2020 under former dean Michael L. Klein. If you look, 'first gens' are everywhere at the college. CST Dean Miguel Mostafá, who has enhanced first-generation funding, and Senior Associate Dean Susan Jansen Varnum were first-generation college students. That's also true of the core FGI staff:

Nelson; Uloma Opara-Osuoha, associate professor of instruction in the Biology Department; and Carlos Bates, a CST academic advisor.

"We all went through what they are experiencing," says Nelson. "So, they can ask us a random question and not feel like, 'How come I don't know this?'"

"You don't know it because, why would you?"

"It's easy for some first-generation students to fall by the wayside and feel frustrated," adds Opara-Osuoha. "They have love from their families, but when it comes to mentoring them and providing individualized knowledge and resources to help them achieve their academic and professional goals, they need a group of people to guide them and make them feel comfortable on campus."

Bates, the initiative's academic advisor, formerly worked for the School District of Philadelphia on students' college and career readiness. The Temple graduate encourages students to drop into his office a couple days per week for advice and one-on-one tutoring provided by two first-gen students who are STEM fellows, as well as volunteer student peers.

Bates also requires students to check in every other week either in-person or via email. "It's so gratifying to hear them having that 'Aha!' moment when their improved study habits are finally working for them."

"Some have told me that, 'I wasn't going to tutoring because I felt dumb.' But then they realize a lot of students are going through the same thing and now they're not afraid to ask questions."

### TRI-ALPHA PRESIDENT AND ASPIRING DENTIST

Some of the tutoring and peer mentoring is offered by the members of Alpha Alpha Alpha (Tri-Alpha), the national honor society for first-generation



college students, including Nikki Cao, the Temple chapter's first president since fall 2022. She is the daughter of Chinese immigrants and restaurateurs who came to the Philadelphia area 20 years ago.

For Cao, her "greatest satisfaction comes from bringing older and younger students together and hearing the first-year students and sophomores say, "I really appreciate this. It makes me feel like I'm not alone."

Cao, a biology major who wants to go to dental school, spent the summer of 2023 shadowing dentists during the Summer Health Professions Education Program at the University of Nebraska Medical Center. Since January, she's also been a research assistant at the Lewis Katz Medical Center's Center for Asian Health and has helped biology students as a peer laboratory assistant.

"It's really taught me a lot," says Cao, whose letter of recommendation was written by Nelson.

### 'SO MUCH I DIDN'T KNOW'

"There's so much I didn't know about college," says Katie Lazaro, a junior biology major from West Grove, Pa. Her mother owns a cleaning business and her father operates Daddy's Kitchen, a Chester County restaurant where Lazaro has worked since she was 14.

One of her first-year seminar assignments was to interview one of her professors. She chose Nelson and was surprised to learn that his parents also were not college graduates. "Ever since, we've bonded and I got involved with the First-Generation Initiative," explains Lazaro.

That involvement includes being the recipient of a First-Generation Scholarship and managing social media for Temple's Tri-Alpha chapter. Also, as a STEM Leadership Fellow, she works with her mentor, introductory biology lab coordinator and assistant professor of instruction, Jay Lunden, also a first-gen college student. Her role: helping first-year biology lab students.

Lazaro, who hopes to serve her Hispanic community as a physician's assistant, says, "Thanks to the First-Generation Initiative, I've definitely been able to get out of my comfort zone, meet new people and collaborate with so many others, not only students but also professors and doctors."

### **EARLY MATH PROGRAM PAVES THE WAY**

Born and raised in Pennsylvania, Juan Diego Cervantes Ramirez moved with his parents

and younger brother and sister to Oaxaca, Mexico, his parents' home town, in 2013. He didn't return with his family until his senior year of high school.

"I wasn't expecting to go to college right after I moved back," the son of a landscaper recalls. "I was worried about my credits and the language barrier."

Nonetheless, after he applied to Temple, Nelson recommended that he enroll in FGI's First Summer Math Bridge Program. The dedication and academic perseverance he demonstrated in that program were some of the factors that led to a four-year annual \$5,000 First-Generation Scholarship.

"The summer program really helped me familiarize myself with college and be better prepared for math," says Ramirez, a chemistry major. Now considering a career in forensics, he finished his first year with a 3.80 GPA.

### **CONFIDENT YOUNG RESEARCHER**

Tanujaya's summer research experience at Brown University built upon her experiences at Temple, which have included working two years in a research laboratory at Temple University Lewis Katz School of Medicine with Parkson Lee-Gau Chong, a professor of medical genetics and molecular biochemistry; serving as an undergraduate research peer mentor for other students; and serving as president of the Temple chapter of Foundations of International Medical Relief of Children, which combats health inequities both locally and abroad.

"With the growth I have experienced in Dr. Chong's lab," she says, "I know my abilities and definitely feel more confident in myself and my ability to do research—both by myself and helping others."

### **To help students thrive, CST's First-Generation Initiative offers:**

- First Summer Math Bridge Program: Presented the summer before enrollment, the four-week online program helps students transition to college-level math
- Four-year, \$5,000 annual First Generation Scholarships for five students in each class who demonstrate academic potential and economic need
- First-year seminars for groups of 20 students that cover registering for classes, applying for scholarships and grants and study and time-management skills
- Social events that foster community and workshops on topics such as paying for school
- Sessions on building resumes, applying for internships and networking at Temple and beyond, hosted jointly with CST's Office of Student Professional Development
- Alpha Alpha Alpha (Tri-Alpha): Temple sponsors a very active chapter of this national honor society for first-generation college students





## Message from Development and Alumni Affairs

At the College of Science and Technology and across the university, 2024 has been an exciting year. John Frye was selected as Temple's 15th president. A leader in higher education, he has impressive success in enhancing academic and research excellence, community and global engagement and fundraising and alumni relations.

Temple received a record-breaking number of applications for the fall 2024 semester, and deposits were up significantly over 2023. Here at CST, we are seeing similar growth in applications, deposits and registrations. In the spring, we attracted some of our largest crowds ever of prospective students and their parents for Experience Temple Days. Fall Open Houses were just as bustling.

Miguel Mostafá—who celebrated his first full year as CST dean in October 2024—brings so much enthusiasm to his leadership role, whether he's answering a parent's question at an enrollment event, working the barbecue at a retreat for CST's academic advisors or meeting with a donor to learn more about what drives their generosity.

For the 2024 fiscal year, CST recorded one of its largest fundraising totals ever. This extraordinary support will enhance scholarships for talented students, strengthen our Research Scholars Program for undergraduates, positively impact each of our departments and much more.

Philanthropy is essential to the college's continued success. Alumni donors support merit scholarships that attract talented students. Estate gifts help CST set a course for its future. Grants from local and national foundations and corporations help to amplify the impact of CST's research.

An essential part of our success is getting to know alumni, what connects them to the college and what inspires their philanthropy or volunteerism. No one has done this better than Lynne Corboy, our major gift officer. Lynne joined the college a little more than five years ago and is now going on to her life's next adventure. Thank you, Lynne, for moving the development and alumni relations office forward and for your commitment to students and graduates.

To our alumni and other supporters, our achievements rely on your continued support. Thank you for all you do for the college. With research that makes a lasting impact on society and an academic program that propels students into amazing careers, CST's best days are ahead.

Sincerely,

Kathy McGady  
*Assistant Dean for Development and Alumni Affairs*

### How can you help CST?

- Support scholarships for talented students
- Fund young researchers and experienced faculty
- Support initiatives on campus and in the community



**Make your gift today.**

Learn how you can be part of CST's success by contacting me at **215.204.4704** or **kathleen.mcgady@temple.edu**

## Scholarship honors Professor Grant Krow

Seth Herzon, CST '02, made a \$50,000 gift to endow the Grant Krow Memorial Scholarship. Named for a former Temple chemistry professor, the fund will provide financial support for an undergraduate or graduate student with a major in the Department of Chemistry, with preference for a student who is conducting organic chemistry research.

Herzon, who worked in Krow's lab as an undergraduate, is currently a professor of chemistry at Yale University. "My scientific story has been shaped by pivotal moments and influential mentors," said Herzon. "One such figure who left an indelible mark on my life was Professor Grant Krow. Professor Krow's passion for physical organic chemistry sparked my interest in the field, and his mentorship gave me the confidence to pursue a career in research and academia."

Following completion of his postdoctoral studies in 1969, Krow accepted a position as an assistant professor of chemistry at Temple. He was promoted to associate professor in 1974 and to full professor in 1980. He served as a visiting professor at Oxford University and the University of Wisconsin, Madison and as chair of Temple's Chemistry Department. He was also a practicing lawyer and earned his JD in 1978 from Temple. Krow died in 2015.

"This initiative is deeply meaningful to me, given my familial connection to Temple and Philadelphia, and my own transformational experiences there," explained Herzon. "This scholarship will support bright, hardworking students at Temple who may have fewer resources. It will provide critical financial support to ensure that deserving students have the opportunity to excel in the field of organic chemistry."

## Supporting talented CST students

Michael Gealt, CST '70, endowed a scholarship to support CST undergraduates. The \$50,000 gift will go toward establishing the Gealt Family Scholarship, to provide a scholarship annually to a student with financial need who is enrolled in CST.

Gealt has had a successful career in higher education leadership. He was Central Michigan University's (CMU) executive vice president and provost and a professor of biology from 2013 to 2019. At the time he stepped down, he was recognized for being a champion of student success, teaching excellence and nationally recognized research endeavors.

Prior to joining CMU, Gealt served as dean of the College of Science and professor of biology at the University of Arkansas at Little Rock;

dean of Engineering, Mathematics and Science at Purdue University Calumet, now Purdue University Northwest, and director of the School of Environmental Science, Engineering and Policy at Drexel University as well as other faculty and administrative positions at Drexel.

"I had a long and wonderful career as a university faculty member and administrator that built upon lessons learned as a Temple biology major," explained Gealt. "Perhaps more important than what I learned in my classes was the mentoring that happened outside the classroom. Especially important in my life was the influence of biology professor Barbara Brownstein. I started the Gealt Family Scholarship to help current and future students have the same opportunities that I had."

## Gates Foundation supports malaria drug resistance research

The Bill and Melinda Gates Foundation is supporting the work of Maciej Boni, professor in the Department of Biology, whose work focuses on drug-resistance in malaria across Africa.

Malaria eradication is a top priority of the Gates Foundation. The gift of \$2.175 million will go toward modeling "the emergence, spread, and mitigation of artemisinin resistance in selected African countries, with a focus on evaluating strategies designed to slow or halt the spread of artemisinin-resistant malaria."

As an internationally recognized evolutionary epidemiologist, Boni's work investigates how diseases evolve during epidemics. He had been researching drug resistance in malaria since 2008, long before it reached crisis levels.

His lab, which operates out of the college's Institute for Genomics and Evolutionary Medicine, is one of just a handful of labs in the world conducting the kinds of highly specialized disease modeling that can help African countries develop strategies to slow down drug resistance in malaria. He and his lab are part of several consortia and international collaborations developing the preparations and responses to artemisinin-resistance in Africa, an urgent global health problem that affects hundreds of millions of people.





PHOTO: RYAN S. BRANDENBERG

## Lynne Doherty, CST '95, named to Gallery of Success

A leader in sales organizations and a driver of positive business outcomes for customers for more than 20 years, Lynne Doherty has been named to Temple University's Gallery of Success. A collaboration of Temple's Office of Alumni Relations and the Career Center, the honor recognizes outstanding alumni for their inspiring success.

Doherty was recently named president of field operations at SonarSource, responsible for driving revenue and ensuring that customers are successful in their pursuit of clean code. At Sumo Logic, she served as president of worldwide field operations, responsible for global sales and customer success teams. She sits on the Board of Directors for CloudBees and the American Red Cross National Capital & Greater Chesapeake Region.

Prior to Sumo Logic, Doherty was the executive vice president of global sales and marketing at McAfee, responsible for their enterprise sales and marketing teams. In her time at McAfee, she led them through their initial public offering, sale of the enterprise business, spin-out as a new company and acquisition of FireEye Products. Before McAfee, Doherty spent 15 years at Cisco in various leadership roles, most recently as senior vice president of U.S. commercial sales, Cisco's largest single-market sales organization.

At CST, Doherty majored in computer science and mathematics. She established a four-year, full-tuition scholarship to support a CST student who is a graduate of a public school in the School District of Philadelphia.

**BE A MENTOR.** Learn more and complete the Owl to Owl Mentor Program application at [cst.temple.edu/owl](http://cst.temple.edu/owl).

## MESSAGE FROM THE CST Alumni Board

I'm an Owl to Owl mentor and I want you to be an Owl to Owl mentor, too.



Think about the impact a mentor—a boss, a professor, a colleague—has had on your life and career. Think about how their experience helped you set a goal or make a tough decision.

Think about the person you turn to for work advice. The person you lean on when you lean in. The person who sometimes understands you more than you understand yourself.

Think about it. Now that's the impact a mentor can have on a young person's life.

At CST, the Owl to Owl Mentor Program connects CST students with successful Temple alumni. Whether your career is in medicine, biotech, geology or data science, whether you are a teacher, entrepreneur or CEO, we will match you with a student with a similar major and career interests.

The time commitment is minimal, requiring just a few meetings over two semesters, but the impact you make on a student's education and career can last a lifetime. Mentors help students think about what they want to achieve in life and map out strategies for achieving their dreams.

Being an Owl to Owl mentor is one of the most impactful ways for Temple alumni to give back to the university. For me, being a mentor is also so much fun. You can make a real difference in a student's life and help us build a stronger alumni community that supports the College of Science and Technology.

Sincerely,

Michael Remaker, CST '06  
CST Alumni Board President

## Making medical discoveries

by Avery Bumsted

Drawn in by the vast array of extracurricular activities and the dynamic academic environment, Reza Abdavies knew the College of Science and Technology was where he could thrive. His decision was solidified after touring the campus and feeling an immediate connection to the community and its offerings.

A pivotal moment in Abdavies' academic journey at Temple was his immersion in parasitology. The course emphasizes the identification, pathology and control of significant medical parasites, complemented by hands-on laboratory experience. Through his journey in the course, Abdavies found his perspective on medical research especially broadened.

Abdavies' ambition and curiosity led him to the Lankenau Institute for Medical Research,

where he delved into the effects of essential micronutrients and their effects on the epithelial barrier function. This significant internship experience not only resulted in a co-authored publication, but also solidified his passion for research, setting a firm foundation for his future career in medical research at Children's Hospital of Philadelphia. Abdavies is now a clinical research assistant there.

One of Abdavies' most fulfilling experiences was serving as a peer leader in CST. In this role, he helped incoming students navigate the transition to college life, empowering them in their personal growth and development. This position highlighted his own growth as an undergraduate and emphasized the impact of Temple's community-oriented education.

"Make sure you are taking the time to step outside of your comfort zone and try new things from joining organizations to taking a random class that seems interesting to you," said Abdavies. "Remember to have fun along the way."



PHOTO: BETSY MANNING



Grace Hodges, CST '24

## Hands on invasive species research

by James Duffy

Grace Hodges studied the spotted lanternfly in depth with the Temple Ambler Field Station supported by a Temple University Creative Arts, Research and Scholarship (CARAS) Program grant.

She worked with Brent Sewall, associate professor of biology, on the Field Station's ongoing spotted lanternfly project. "I was awarded funding and I became a Field Station Research Intern," said Hodges, who majored in ecology, evolution and biodiversity. "I had access to the professional development and the feedback that all of the interns receive while also conducting my own research."

According to Hodges, her interest in nature and the world around her came at an early age. "I

grew up really enjoying nature and being very curious about it; how diverse it was and why things were the way they were," said Hodges.

"Temple Ambler has been a wonderful resource for me," she said. "I get a lot of practice within field observation and data collection skills, which are very important. I will likely continue to be either a field technician or possibly pursue a graduate degree. Having that experience and those skills is essential for being able to move forward with my career."

While at Temple, Hodges worked with the Undergraduate Research Peer Mentor Program, helping students just beginning to experience research.

"Through the program," she said, "I have the opportunity to give other students some guidance and help them determine what interests they would like to pursue at Temple."

## Seeing the forest for the trees

by James Duffy

The natural world always fascinated Ian Stonefield, but finding his career within it took a little trial and error.

“Growing up, I really thought I wanted to be a veterinarian,” said Stonefield, who majored in ecology, evolution and biodiversity. “I started out as a biology major but I felt a pull toward the ecology aspects of the field.”

Stonefield’s first personal Temple Ambler Field Station project focused on the non-native species of woody trees and shrubs in the Temple Forest Observatory after the tornado that struck campus in 2021 and comparing that to data from before the disturbance to see how those non-native species fared through the tornado.

“There is a huge benefit to working with the Field Station in that you’re really exposed to a lot of post-doctorate and post-graduate students and getting their experience and help,” he said.

According to Stonefield, the accomplishments he is most proud of during his time at Temple “are the research presentations I’ve given.”

“I’ve been fortunate to give poster presentations along with oral presentations at Temple Ambler, Main Campus and beyond at conferences,” he said. “Being able to express what I do in my research in these formats has really improved my communication skills and improved my ability to interact with people and answer questions.”

Currently working as a Field Station research technician, Stonefield is exploring graduate school options. “I think Temple Ambler for me throughout my whole time at Temple has provided almost a breath of fresh air,” he said.



Ian Stonefield, CST '24

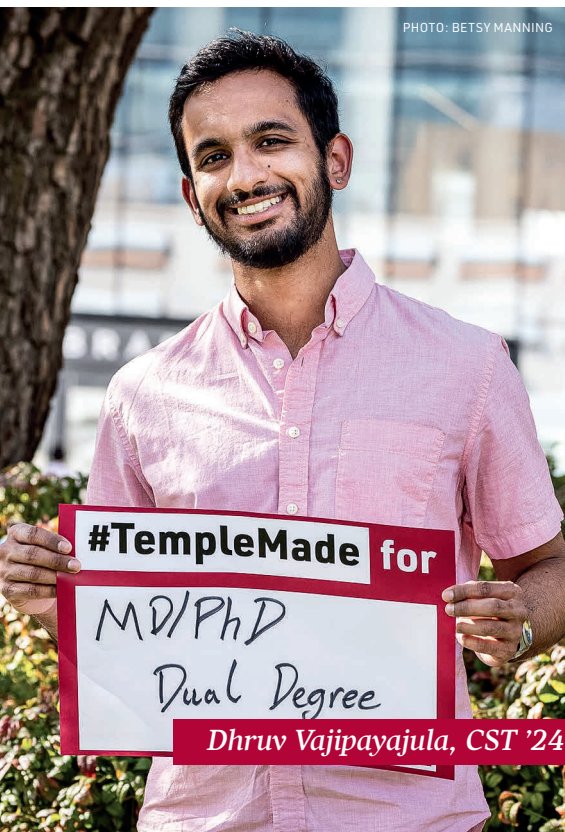


PHOTO: BETSY MANNING

Dhruv Vajipayajula, CST '24

## Temple Made for research and clinical practice

by Brent Baum

Dhruv Vajipayajula has always had an interest in public service and a desire to help others. This ultimately helped him earn a merit scholarship to attend Temple to pursue a degree in neuroscience.

“Temple’s combination of social and educational opportunities and its many accessible resources allowed me to learn a lot and enjoy my college experience,” said Vajipayajula. “The professors at Temple are amazing and I have made some incredible friends.”

Vajipayajula spent considerable time undertaking undergraduate research projects, inspiring him to apply to MD/PhD programs. “The study of medicine marks the intersection

of solving problems and helping people, which is something I’m passionate about,” he said.

As part of his research work, Vajipayajula investigated causes of platelet activation in cardiovascular disease. “The professors at Temple presented many opportunities for research and our lab looked at a particular signaling protein called spleen tyrosine kinase (SYK) where we found certain molecular sites on the protein that drastically affect how platelets behave in different systems,” said Vajipayajula.

In the summer of 2023, Vajipayajula was part of an eight-week program held at Thomas Jefferson Hospital where he shadowed physicians from each department. “I came out of that experience realizing that working in academic medicine is exactly what I want to do,” he said.

Vajipayajula was accepted into the MD/PhD medical scientist training program at Tufts University, where he will continue to pursue a career in research and clinical practice.



The 30 Under 30 program recognizes trailblazing young alumni who have demonstrated professional success in any industry, significant community involvement or a commitment to maintaining a lifelong relationship with Temple University. 30 Under 30 highlights outstanding Owls from the more than 52,000 young Temple alumni who exemplify what it means to be Temple Made.



*Leah Wenhold Parente, CST '17*

## Diamond gem

A merit scholarship Leah Wenhold Parente received when she applied to Temple made her decision to become an Owl a no-brainer. It also propelled her pursuit of a childhood interest in the environment. Today, as a hydrogeologist in North Carolina, Parente's job is to prevent contamination of groundwater and surface water from wastewater treatment and disposal/refuse systems.

"It's always been really important to me to make sure that the environment is protected for future generations," said Parente. "I feel like I've been very fortunate in that I've been able to do that type of work in both in my graduate research and especially now in my current position with the state."

The Department of Earth and Environmental Science was the right choice for Parente. "I think it's really rare that you have a department where every single faculty member is extremely caring and invested in their students and that shines through," she said.

Parente herself made an impact on the department, serving as a founding member of the National Honor Society for Earth Sciences and as a student ombudsperson, mentoring younger students and organizing events. For that work, Parente earned the Diamond Award. "It was an honor to be recognized

by the department," she said. "And it's one of my finest memories."

Another favorite Temple memory was attending presentations from visiting geologists. "It was so neat to see what other people were doing out in the field and to learn about the possibilities for a career in the geosciences," Parente said.

One of those possibilities is her current position as a geologist/hydrogeologist in the Division of Water Resources Non-discharge Branch at the State of North Carolina Department of Environmental Quality. Parente is making a national impact as she protects North Carolina waters from contamination.



*My Temple education really helped shape me into the professional that I am today."*

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## Committed clinician

In high school, Riya Kulkarni had a transformative experience when, after moving to India from the Bay Area at age 11, she returned to California at 16.

While in India, she shadowed physicians at a hospital and research center. Upon her return to the States, she noted contrasting approaches to healthcare. Since then, she has worked to improve healthcare around the world.

As an undergraduate biology student, Kulkarni volunteered and shadowed at Temple University Hospital. “Volunteering there helped open my eyes to the challenges faced by many with inadequate healthcare access within the United States,” she said. “I realized how access was limited in a major city with so many hospitals and doctors.”

During her time at Temple, she volunteered for a nonprofit and spent seven weeks in Uganda

helping to understand its HIV/AIDS program. “This experience opened my eyes to how important global health work is. I became more passionate about it, and that passion has stuck with me since,” she said.

Kulkarni went on to pursue a degree in osteopathic medicine at the A.T. Still University of Health Sciences in Arizona. During medical school, she discovered that she enjoyed working with children. “You’re truly supporting not just the child but their whole family,” she said.

She continued working on health projects across the globe—screening children for anemia in Peru and building healthcare capacity in Uganda.

Having experienced healthcare on four continents, Kulkarni continues to develop her understanding of cultural differences in healthcare delivery and access. Wherever she



**Riya Kulkarni, CST '17**

is, Kulkarni strives to meet the healthcare needs of the population she is serving.

Kulkarni is now a pediatric cardiology fellow at Nemours Children's Health in Wilmington, Delaware. “As a future pediatric cardiologist, I hope to provide pediatric cardiology services to global populations and building healthcare capacity with my global health career,” she said.

## Hero with a heart

For Jaldhi Patel, the range of opportunities she had during her undergraduate years at Temple helped deepen her empathy and understanding of others—critical to her work as a cancer research coordinator.

“What truly fills me with pride is the ability to be there for others,” she said. “I learned that accomplishments aren’t always just about big wins and shiny medals. Sometimes they are about the moments of perseverance and the times I didn’t give up even when things got tough.”

When it came time to think about college, she knew she needed a place that offered a sense of acceptance that comes with being part of a large international student community. Temple was a natural choice. Plus, she heard nothing but glowing reviews of the school's science program.

An opportunity listed in an email from CST's Student Professional Development office led to Patel's first volunteer research position at Penn Medicine. There, Patel assisted with research into cardiopulmonary resuscitation (CPR), an emergency procedure designed to keep blood flow active in someone who is unresponsive and not breathing.

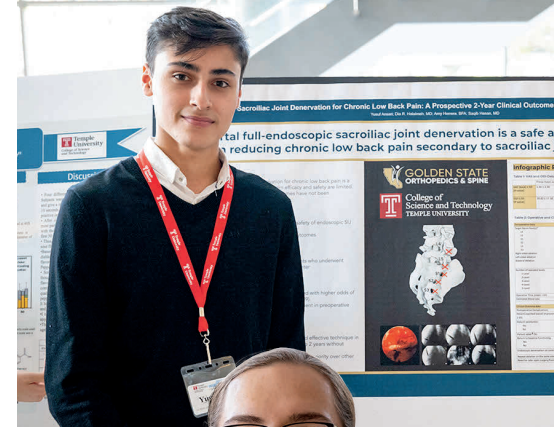
Soon she began volunteering with the Mobile CPR Project, an initiative intended to increase the survival rate from cardiac arrest in underserved neighborhoods. As part of that effort, Patel traveled to churches, schools and stadiums to teach community members the life-saving technique, training thousands and earning national media recognition.

When the biology major graduated, Penn hired her as a clinical research assistant. Today, Patel is a clinical research coordinator at Penn Medicine's Abramson Cancer Center. She credits her time at Temple with her ability to relate to cancer patients from all walks of life.

“Thanks to the experiences I was afforded during my time at Temple, when patients come in I understand not only their disease, but also their day-to-day challenges,” Patel said. “I’m there for them as a provider, but also as a human.”



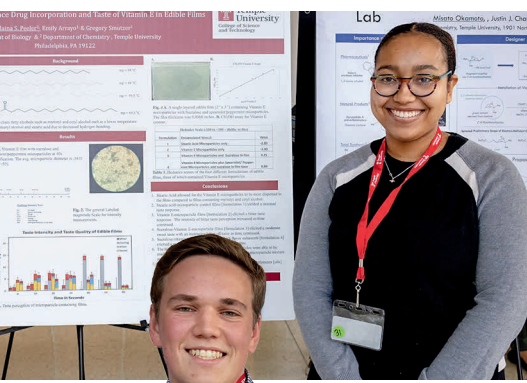
**Jaldhi Patel, CST '20**



# Research Scholars Program Symposium

Celebrating the work of undergraduate students working with faculty researchers.

PHOTOS: DAN Z. JOHNSON



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