

TOWSON UNIVERSITY

# RESEARCH

Discovery, Learning, Impact | 2026

## For the Love of Science

*TU's Course-based  
Undergraduate Research  
Experience empowers students*

**TU**  
TOWSON  
UNIVERSITY

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**Mark Ginsberg**  
President

**Melanie Perreault**  
Provost and Executive Vice President  
of Academic Affairs

**Sidd Kaza**  
Vice President, Research

**Sean Welsh '05**  
Senior Vice President for  
Communications and Chief of Strategy

**Teri O'Neal '98**  
Associate Vice President,  
Communications and Media

## **DIVISION OF RESEARCH**

**Sidd Kaza**  
Vice President

**OFFICE OF SPONSORED  
PROGRAMS & RESEARCH**

**Rebecca O'Brien**  
Assistant Vice President

**CYBER4ALL CENTER**  
**Blair Taylor**  
Director

**TOWSON AI INSTITUTE**  
**Alexei Kolesnikov**  
Director

**OFFICE OF UNDERGRADUATE  
RESEARCH & CREATIVE INQUIRY**  
**Laura Gough**  
Director

## **CONTRIBUTORS**

**EDITORIAL**  
Grace Hoggarth '22  
Mike Unger

**PHOTOGRAPHY**  
Lauren Castellana '13, '23  
Alexander Wright '18

**DESIGN**  
Chris Komisar

**TU**  
**TOWSON**  
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# WELCOME

Dear Colleagues and TU Friends:

Towson University has long been defined by opportunity, our commitment to students and excellent teaching. What is especially energizing is how strongly those same values are evident in TU's research and creative inquiry, and the impact they have on our students, faculty and the region we serve.

In these pages, you'll see a representation of research at TU—research that advances discovery, scholarship of teaching and learning, and creative achievements that shape culture and expand our understanding of the world. We also celebrate impact and public service because, at TU, both rigor and relevance are valued.

At TU, research is education. It creates opportunities for students that other educational components cannot replicate—joining a team that asks real questions, navigates uncertainty, tests ideas, builds knowledge and communicates results. When a student walks across the Commencement stage, we know they have received a complete TU education—one that includes meaningful exposure to research and creative inquiry and the confidence that comes from contributing to a project with a real-world mission.

This is also a moment worth celebrating for the university as a whole. TU is now classified as a Research Colleges and Universities institution in the 2025 Carnegie Classification—a recognition of the growing strength of our academic research. We remain passionately committed to our institutional goal of achieving R2-High Research Activity status, not as a label, but as a way to invest in a sustainable research ecosystem that expands opportunity for faculty and students.

TU formally established the Division of Research in July 2025, reflecting a clear commitment from our president, Mark Ginsberg, Ph.D., and our provost, Melanie Perreault, Ph.D., to strengthen the structures that help research thrive. The division brings together teams and builds centers that help ideas move from spark to impact.

Research growth is a team sport, made possible by many forms of support. Federal and state awards, foundations and philanthropic contributions each play an important role, along with significant institutional investment. Any support expands participation and strengthens the work our faculty, staff and students can do together.

As you read this issue, I hope you share our pride in the people behind this work, gratitude for the partners who make it possible and optimism for what comes next. Thank you for supporting TU's unique research and creative enterprise that builds a culture where discovery, learning and impact grow together.

**Sidd Kaza, Ph.D.**

Vice President, Research

Maryland E-Nnovation Endowed Professor of Cybersecurity



***Our focus on research and creative activities extends beyond the lab, classroom and concert hall—it provides multiple opportunities to engage with and enhance the community around us and share knowledge with the world.***



MELANIE PERREAULT,  
PROVOST AND EXECUTIVE  
VICE PRESIDENT OF  
ACADEMIC AFFAIRS

# Our Impact

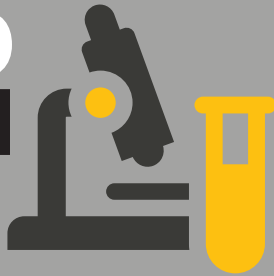
Investment in research and creative inquiry at TU saw a record two years (2024 & 2025). From doctoral program enrollment to faculty engagement in novel research across the university, over 19,000 Towson Tigers are reaping the benefits of financial and mentorship-based investment in research opportunities.

**OVER \$19  
MILLION**

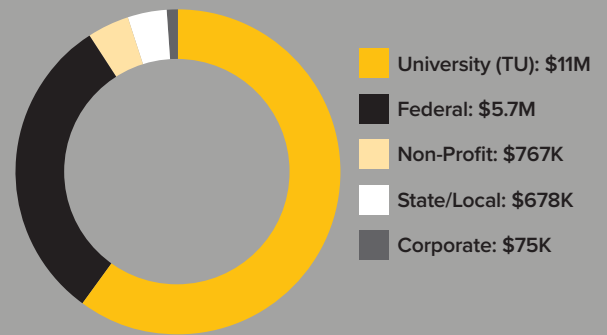
in research expenditures in  
fiscal year 2025

Ranging from federal, state/local,  
corporate, non-profit and  
university investment

Source: NSF HERD survey



## Research Expenditures FY 2025



Doctoral program growth  
across all programs

**20.59%**

Enrollment continues to steadily rise

Source: TU Institutional Research

**>350**

**CURE Posters**

Course-based undergraduate  
research experiences

Source: Office of Undergraduate  
Research and Creative Inquiry



**270**

new grant submissions  
and \$60 million+ in active  
grants in FY2025

Source: Office of Sponsored  
Programs and Research



**1,350+**

Refereed publications and juried creative  
works in the 2024–25 academic year

Source: Faculty Non-Instructional  
Productivity Questionnaire

# Doctoral Programs Gaining Momentum

*TU fosters academic and professional growth across disciplines.*

BY GRACE HOGGARTH '22



Dedication to innovation and mentorship at TU is enduring. While less traveled than the university's undergraduate programs, doctoral program enrollment at TU has doubled since 2022 across all four programs, and with the nature of the research opportunities and the dedication of the faculty and program directors, it's evident why.

## Autism Studies

As the first and only inter-college doctoral program currently offered at TU, the Autism Studies doctoral program is a hub for novel research and advocacy.

The idea to establish the program before welcoming its first cohort in 2023 came from acknowledging the opportunity to craft academia focused on autism studies through interdisciplinary means—and program director Kaitlyn Wilson, Ph.D., knew from the start that she wanted to be involved.

The program represents a wide array of professional fields, including psychology, special education, social work, STEM education and adult services in applied behavioral therapy (ABA).

Hiring faculty to support the program across the College of Health Professions, the College of Liberal Arts and the College of Education has enabled the program to build autism expertise within faculty across the university.

## Instructional Technology

In a post COVID-19 world, hybrid and fully remote academia and work remain a balanced option for many. The Instructional Technology doctoral program is offered in a multi-modal format with students participating on campus and online through a cutting-edge telepresence system—enabling cross-cultural and generational collaboration.

Career opportunities for graduates of the program are wide-ranging. Some graduates have pursued careers as K–12 administrators or tenure-track positions in higher education while others pursue careers in business and training or as directors of instructional technology centers.

Given the diverse professional paths graduates take, for program director Bill Sadera, Ph.D., it is important to provide a learning environment that fosters individualized support and development.

With a record enrollment of nearly 60 active students and international students, the program maintains an attrition rate significantly lower than the national average—a testament to

prioritizing student support, community and a low student-to-faculty ratio.

## Occupational Science

As one of only three Occupational Science doctoral programs in the nation—and the only one that is fully remote—this program offers a tailored experience bolstered by years of interdisciplinary and community partnerships and university support.

***“Our Ph.D. programs are about more than producing research; they are about developing scholars who can ask and answer consequential questions, work across disciplines and mentor the next generations of students.”***

■ DAVID OWNBY, INTERIM DEAN, GRADUATE STUDIES

Students graduate from the program prepared to pursue roles in education, health care, policy and other fields through which they can contribute to the betterment of health and well-being through consideration of occupational participation.

Program director Jenna Yeager, Ph.D., hopes to expand contributions to collaborative research between faculty and students, to enable academic presentations across the nation and globally.

## Information Technology

With a focus on supporting students seeking to attain tenure-track positions, the Information Technology doctoral program yields cross-disciplinary mentorship experience and boosts student research profiles.

Looking toward the future, Wei Yu, Ph.D., (program director) and Mike McGuire, Ph.D., chair of the Department of Information Technology, recognize the increased role AI expertise will play across career specializations and in the job market.

In the last four years, the department has hired several researchers in the artificial intelligence field. Hiring high-end AI researchers translates into expertise that benefits undergraduate students, as well.

Graduates complete the program with competitive resumes that boost their research profile and the knowledge and experience to take on full-time teaching positions. 

# STEM Summer Research Abounds at TU

*TU CURE funding supports summer molecular biology research.*

BY GRACE HOGGARTH '22

PHOTOS BY LAUREN CASTELLANA '13, '23



Research thrived at TU in summer 2025. Students took part in one of several Course-Based Undergraduate Research Experiences (CURE) held across the Fisher College of Science and Mathematics to expand undergraduates' research experience.

Over the course of just five weeks, 15 students participated in the Bio CURE summer research experiences. They learned and used a variety of molecular biology techniques on small protein characterization and protein degradation.

With the reduction in federal training grants, the TU Office of Undergraduate Research and the Fisher College of Science and Mathematics teamed up to create "in-house" research opportunities through CUREs that would provide students with similar research experiences.

"This experience reaffirmed my love for science. Being able to put what I've learned into practice is really reassuring me that this is what I want to do," says molecular biology, biochemistry and bioinformatics major Aderinsola Jibodu '26. "Conducting research has made me realize there's more than one path out there. Maybe research is my path."

Summer research opportunities like this enable students to broaden their academic horizons, attempt to solve real-world problems and encourage them to

see themselves in research as part of their future careers.

"Summer research CUREs are an ideal opportunity for students to experience research first-hand and contribute in meaningful ways to our knowledge of

***"At TU, we're expanding CUREs beyond STEM into all of our academic colleges and anticipate similar outcomes as students are exposed to the process of doing research in their discipline. They may discover a new passion that will fuel their future career path."***

■ LAURA GOUGH, PH.D.

molecular biology," Professor Matthew Hemm, Ph.D., says, "This summer the Bio CURE students did a fantastic job conducting technically challenging experiments that significantly contributed to my lab's research on small protein functions in bacteria."

## Supporting student research

CUREs are tailored research experiences dedicated to exposing undergraduate students to research early in their academic careers.

They're an inclusive way of approaching student research, increasing student engagement and retention in their major and future STEM careers.

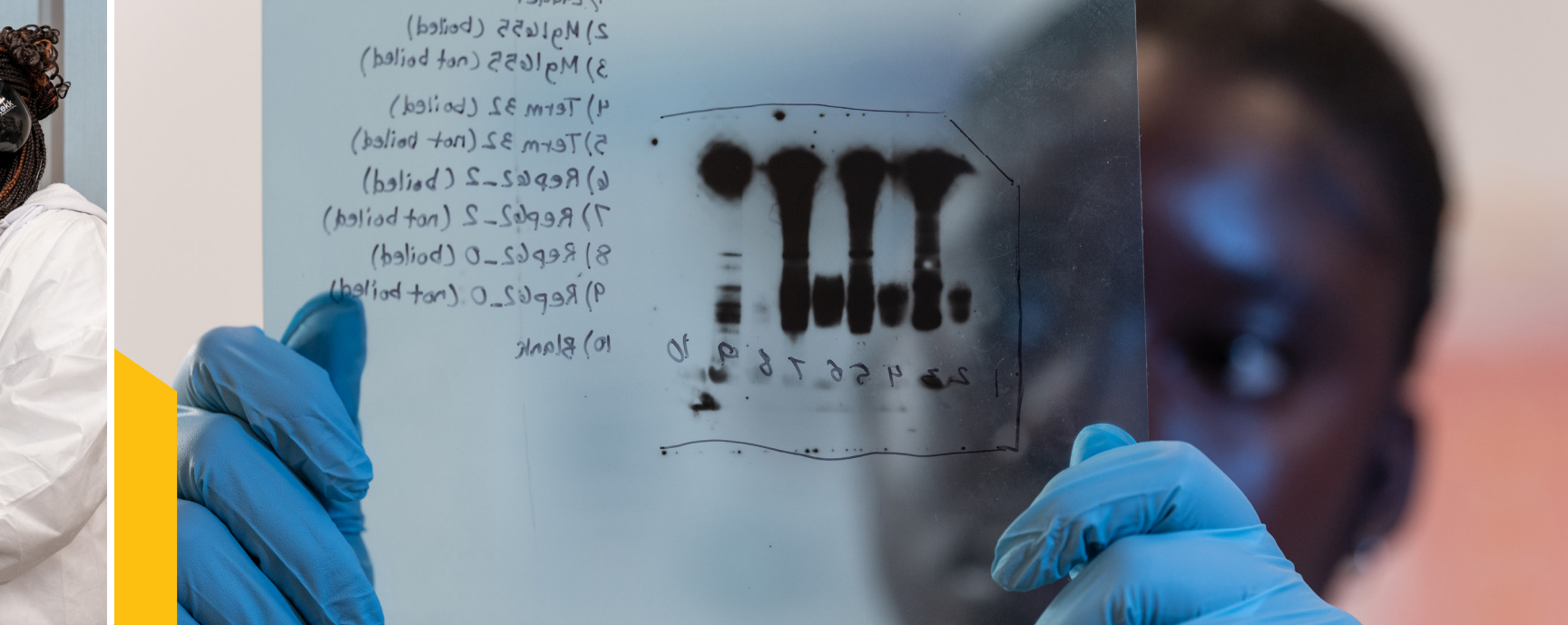
"Working towards something that has the ability to produce real results with other undergraduate students who are excited about the research is one of the best parts of this experience," molecular biology student Lohini Suresh '26 says.

## The building blocks of proteins

Under the tutelage of Hemm and Cheryl Warren, Ph.D., students characterized proteins that had been identified in Warren's Molecular Biology Laboratory class the previous semester.

Protein characterization is the process of determining and describing the structure, properties and biological function of proteins.

Having this information is essential in drug development, as it ensures the safety and efficacy of a therapeutic protein and facilitates the investigation of its interactions with pathogens, according to the Texas-based biotechnology company Cusabio.



In the molecular biology Bio CURE, students characterized proteins using biological techniques like sonication—the use of sound energy to agitate particles with the intention of extracting one or more compounds from a given sample. They also utilized native gel protein electrophoresis—a technique to separate proteins based on size and structure—and western blotting, which can identify individual proteins in a biological sample.

### Providing a path to explore research

Research opportunities are ample at TU for students across disciplines: Honors College and Hill-Lopes scholar Chinenye Ofor '26 is no exception. Ofor was recommended for the molecular biology CURE.

With a love for STEM and communications, Ofor is fusing her majors in molecular biology, biochemistry and bioinformatics and communication studies to approach her future STEM career through a mentorship lens.

"TU puts you ahead, and it's nice to be ahead of the curve. This experience has given me a lot more to talk about with others in the STEM field," Ofor says. "It feels good to be able to share the research you've done and for others to see you as accomplished." 

## THE NEXT EXPERTS IN CYBERSECURITY

BY KYLE HOBSTETTER

TU is creating new opportunities to ensure its computer science students are ready to lead in the growing world of cybersecurity.

The Office of Undergraduate Research and the Jess and Mildred Fisher College of Science and Mathematics teamed up to launch Course-Based Undergraduate Research Experiences (CURE), an in-house summer research program designed to give students high-level experience without relying on federal grants.

Over five weeks, nine students participated in the Cyber CURE summer research experience, guided by Bassam Zahran, clinical assistant professor in the Department of Computer and Information Sciences. The program, which was also through a partnership with TU's Center for Interdisciplinary & Innovative Cybersecurity (Cyber4All), had simple ambitions: to help students understand that research isn't just about learning facts — it's about learning how to think.

"As a research university we want to make you think, not just memorize," Zahran says. "If we focus on that research part, we can teach them how to be thinkers, how to be creative, how to add to the world rather than just receive and deliver. We want our students to step forward to being a leader and an innovator."

At the start of the program, Zahran challenged students to explore a topic they

knew little about. He chose SQL injections (SQLi) — a common and dangerous hacking method that exploits weaknesses in an application's database security. SQLi attacks can expose or destroy data, change account balances or even give hackers administrative control of a database. For Zahran, it was the perfect topic to explore the real-world stakes of cyber defense.

"No business on earth can survive without having a database system," Zahran says. "Your first line of defense is to protect against SQL injections because it's a way to access your information, your database from outside. So how to stop that is a good technical skill to learn and apply."

Unlike his typical classes, Zahran took a step back during the CURE project. His goal was to let students take full ownership of their research — to move from following instructions to discovering answers.

He compares the experience to learning to swim, in that once you learn you never forget.

"The best thing about this is the whole experience is they started not knowing anything about this topic, and then after five weeks, stop any one of the nine students and ask them about SQL injection. And you won't be able to get rid of them," Zahran says. "They will talk forever."

# The Faces of Research at TU

*TU faculty are solving problems and improving lives through their research.*

Through research, TU faculty in every college and discipline strive to make broad impacts on our understanding of the world and the way we live in it. Here are eight faculty members whose research is making an impact on our communities and our world.

## TEACHING 21<sup>ST</sup>-CENTURY THINKING

RACHEL BILLMAN



Students in classrooms today need to be prepared to work with the technology of tomorrow. That means learning computational

thinking—the step-by-step critical thinking skills that enable us to approach problems systematically. Although it's a foundational skill for critical thinking, it's a newer approach in pedagogy, and special education professors Rachel Billman and Kandace Hoppin discovered gaps in how this type of thinking is taught in the K–12 environment—particularly among students with disabilities.

In response, the two began implementing computational thinking instruction into the College of Education's curriculum. They collaborated with fellow faculty on professional development opportunities to weave computational thinking into their coursework so TU students who are future special educators would be prepared to instruct on it. Billman and Hoppin also developed a free, immersive summer camp that offers elementary and middle school students hands-on development of computational thinking skills through robotics, coding and more. Camp InSpECT gives TU's future special educators real-world, paid experience in teaching computational thinking while enabling students with disabilities a chance to develop these skills in a fun and accessible way.

## REINTERPRETING PHILOSOPHY

EMILY PARKER



Twentieth-century French philosopher Simone de Beauvoir made enduring contributions to feminist theory and literature, even earning a Nobel

Prize nomination. Yet the social constructs of her time meant history relegated her to a footnote of her colleague and partner Jean-Paul Sartre. This oversight means some of Beauvoir's most important works weren't translated with the care or context they deserve. College of Liberal Arts philosophy professor Emily Parker is working to correct that. Along with translators and fellow academics at the University of Illinois and Case Western Reserve, Parker is retranslating Beauvoir's 1947 book "The Ethics of Ambiguity" with a deeper understanding of the philosopher's viewpoints on singularity, freedom and connection.

## IDENTIFYING PRACTICES FOR AGING WELL

RIAN LANDERS-RAMOS



The general belief is that physical activity gets harder as we age. But what if older adults' muscles are aging *because* they're less active? That's what

associate professor of kinesiology Rian Landers-Ramos set out to discover in a study comparing the small blood vessel

and mitochondria function in muscles of older and younger adults with similar activity levels. The study uses a cutting-edge, near-infrared spectroscopy (NIRS) device that enables Landers-Ramos and student researchers in the College of Health Professions to quickly and non-invasively examine small blood vessel and mitochondrial functions, which play a critical role in preventing muscle fatigue. The study found that when activity levels are matched, there is little difference in the small blood vessel and mitochondrial functions of older and younger adults—showing that exercise helps keep our muscles working well.

## THE IMPACT OF HEARING LOSS

CHHAYAKANT PATRO



Assistant professor Chhayakant Patro's audiology research focuses on helping patients with hearing loss. In the Department of Speech-Language

Pathology & Audiology, Patro, Ph.D., is conducting research on otitis media, better known as an ear infection, to understand its impact on hearing loss in children. In collaboration with a faculty member from University of Texas at Austin, Patro received a \$1.5 million R01 grant from the National Institutes of Health and the National Institute on Deafness and Other Communication Disorders to study the

long-term effects of otitis media on listening skill development after treatment. Patro is working with the TU Childcare Center and students in the College of Health Professions' Department of Speech-Language Pathology & Audiology to get a comprehensive idea of the cognitive impacts, speech issues and hearing deficits caused by ear infections.

## CREATING ACCESSIBLE SUPERCONDUCTORS

VERA SMOLYANINOVA



As computing technology advances so too does the need for faster processing speeds. Physics professor Vera Smolyaninova's

research is working to build just that. Smolyaninova works closely with student researchers in the Fisher College of Science & Mathematics to analyze the properties and explore the possibilities of artificial metamaterials, looking at how they can be applied to photonics and enhance the properties of superconductivity. Since photons—unlike electrons—can travel at the speed of light, using the understanding of photonics to create light-adapting artificial materials can make them work better, thereby increasing their capacity to process information. Her research using metamaterial approaches to enhance the properties of superconductors has many important potential applications, like enabling more effective and affordable MRI machines and expanding the potential of quantum computing.

## CURIOUS ABOUT CRYPTO

JIAN HUANG



While he's teaching in TU's College of Business and Economics, finance professor Jian Huang is also learning about the next wave of

business innovation—cryptocurrency. Curious about this growing form of currency, Huang decided to study how universal holidays—or holidays celebrated by a multitude of people—can affect cryptocurrency returns. In his research, Huang used the Chinese financial market to investigate this behavior but found the pattern appears in other parts of the world as well. He also found that when investor sentiment is positive, it can moderate these holiday effects. Compared with traditional stocks, crypto is more sentiment-driven and volatile. As he continues his research and observes how the cryptocurrency market evolves, he admits that many things have yet to settle. But over time, clearer rules, better infrastructure and learning-by-doing will likely bring more market stability.

## ADVANCING AI

WEI YU



Wei Yu, Ph.D., was elevated to an IEEE Fellow, one of the highest honors awarded by the Institute of Electrical and Electronics

Engineers (IEEE) in 2026. He is the first person from TU to receive the honor. The distinction recognizes his significant research contributions to security and

artificial intelligence (AI) in cyber-physical systems and the Internet of Things (IoT), specifically his work in security and AI-powered edge devices in critical infrastructure systems. Yu's research focuses on advancing secure, AI-enabled cyber-physical and IoT systems that underpin energy, transportation, manufacturing and smart-city infrastructure. As the director of the Cyber-Physical Systems and Security Research Laboratory he has mentored 24 doctoral graduates from TU; 16 of whom are faculty at universities conducting research and teaching.

## PREVENTING SEXUAL VIOLENCE

COMFORT TOSIN ADEBAYO



Sexual violence is a tragedy in any context, and individuals in cultures lacking access to sexual health information are especially

susceptible. That's the situation in Comfort Tosin Adebayo's home country of Nigeria. Over the past three years, the College of Fine Arts & Communication professor has researched the prevalence of sexual violence throughout the country, interviewing and/or surveying more than 100 survivors to identify culturally relevant risk markers, support strategies and prevention tactics. Now she's using the findings to create an online platform that offers anonymous emotional support for survivors as well as sexual health education and sexual violence awareness tools for all community members. The platform also gathers anonymous data that can be useful in providing recommendations to policymakers. 

# TU Faculty Member Awarded Elkins Professorship

*Amanda Jozkowski's ARISE Project helps advance responsible Generative AI integration in higher education.*

BY GRACE HOGGARTH '22



As technology continues to evolve, so must academia's relationship with it. Through the Elkins Professorship for Academic Transformation, Amanda Jozkowski, Ph.D., program director of the M.S. in Occupational Therapy, is piloting the "GenAI Learning Partner" to help students use generative AI ethically and professionally.

Awarded by the University System of Maryland, the Elkins Professorship for Academic Transformation enables faculty members to conduct transformative projects focused on the use of generative AI to enhance teaching and learning.

## Meet the "GenAI Learning Partner"

Over the course of three semesters, Jozkowski developed and piloted the "GenAI Learning Partner" model in a graduate-level course on occupational therapy research methods.

The model helps students utilize AI as a study companion, rather than a shortcut. Through Microsoft Co-Pilot the model guides them through structured prompts and reflections that encourage critical thinking and confidence.

Building on the model, Jozkowski proposed the AI-Responsive Instruction and Student Engagement (ARISE) Project when she applied for the Elkins Professorship.

The project brings together faculty in nursing, public health, occupational therapy, audiology and related programs in TU's College of Health Professions to explore how AI integration can improve teaching and learning in graduate research instruction. Funds for the project will also support student researchers facilitating

participant focus groups and surveys.

"This project has so much promise for increasing accessibility, improving efficiency and helping students develop a depth of understanding that they may not have simply from textbook or classroom interactions," Jozkowski says. "They can apply it to their own personal interests and learning styles, which improves connection."

ARISE is the signature initiative of the PREP-AI Lab (Pedagogy and Research for Educational Partnership with Artificial Intelligence), which supports the preparation of educators and future health care professionals for ethical, critical and reflective engagement with generative AI.

Once focus group data of the first set of faculty members and students involved are collected, it is Jozkowski's hope that its insights will help students develop transferable skills in research reasoning, ethical AI use and digital professionalism that are aligned with graduate competencies and licensure expectations.

"Our next steps will really be to answer the question of, 'Does using generative AI to facilitate learning actually make a difference in grades/course performance?'" Jozkowski says.

## Generative AI as a companion to health studies

By providing students with generative AI literacy opportunities, they will be able to use these tools ethically and strategically to assist them in their learning—not as a replacement to studying and information retention but as a thoughtful tool.

One of Jozkowski's primary goals in training faculty members on the "GenAI

Learning Partner" is to provide reusable curriculum tools and implementation frameworks that improve instructional efficiency and student support.

With AI literacy becoming an essential skill across disciplines and industries, the reusable curriculum toolkit Jozkowski develops will enable faculty members across the USM to design responsible, student-centered AI pedagogy for the health and human services fields.

"We can't afford to stick our heads in the sand. If I can help students use [generative AI] in a way that is thoughtful and strategic, what they will produce using GenAI is going to be much stronger and more helpful to them and their learning," Jozkowski says.

## Remaining open-minded

As recent data indicate, 90% of college students incorporate the use of artificial intelligence into their studies. So, it is more important now than ever to invest in GenAI literacy among faculty and students.

"I want to make sure I am always thinking about the ethics and long-term implications [of this technology] while also trying to be as creative as possible," Jozkowski says. "We don't know what higher education is going to look like in 50—let alone five—years. We need to be open but cautious and thoughtful and ensure we are prioritizing student learning—in my case, patient safety."

Within the College of Health Professions at TU, faculty members like Jozkowski continue to push the boundaries of experiential and innovative learning methods for students. 

# Searching for Solutions for the Public Good

*TU research is breaking new ground and complementing current knowledge.*



## GOING BATTY

Costa Rican biologist Jorge D. Carballo Morales '25, who began his research at TU in 2023 in the master's biology program, is a student in the lab of assistant professor Daniel Caetano, Ph.D. Carballo Morales is studying the macroevolution of bat families and how their diets play a role in their evolution and contribute to various ecosystems.

***Bats are so important, and we take them for granted. They are essential seed dispersers in the tropics and ensure the continuity of forests.***

■ JORGE D. CARBALLO MORALES '25

Under Caetano's wing, Carballo Morales is learning how to apply statistical methods to his data collection on bat diets. To better understand bat diversification, Carballo Morales is working through 3,000 rows of existing data to make reconstructions of bat diets from when bats first appeared more than 50 million years ago to the present day. Studying the evolution of bat diets is key to understanding how these essential seed dispersers support forest ecosystems.

## SEARCHING CELLS FOR SOLUTIONS

Biology professor Elana Ehrlich, Ph.D., is using her third grant from the National Institutes of Health to study Kaposi's sarcoma herpesvirus (KSHV), an infection associated with HIV/AIDS.

Her research seeks to determine how and why KSHV hijacks the cellular protein degradation system to evade the immune system and promote viral replication. By identifying proteins targeted for degradation by the virus, Ehrlich hopes to identify new drug targets.

***From an undergraduate training perspective, for students to have real-world research experience can be life changing.***

■ ELANA EHRLICH, PH.D., PROFESSOR

Ehrlich is working with nine undergraduate students to test how drugs target the "tagged for trash" proteins, impact the replication of the virus and play a role in whether the virus remains latent or could infect other cells.



## MOBILITY AND MIGRATION

Associate professor Maria João Lobo Antunes, Ph.D., is exploring the impacts of intracity residential mobility on deviant behaviors and victimization among minority and immigrant youth.

With her background as a quantitative criminologist, Antunes has identified the need to examine how inner-city and intracity moving influences minority and immigrant youths' experiences with perpetrated or experienced violence.

***I like to inform my teaching with my research, and I like my research to be informed by my teaching.***

■ MARIA JOÃO LOBO ANTUNES, PH.D.,  
ASSOCIATE PROFESSOR

Antunes is expanding her research on "crimmigration"—the merging of immigration and the legal system—with the support of the W.E.B. Du Bois grant from the National Institute of Justice and connecting it to the classroom through a special topics course, Immigrants, Crime and Justice. 



## Meet the TU Lab Studying What's in Our Water

*Professor John Sivey's Aqueous Environmental Chemistry Laboratory gives students a unique research opportunity.*

**BY KYLE HOBSTETTER**

**PHOTOS BY ALEXANDER WRIGHT '18**

When John Sivey, chair and professor in TU's Department of Chemistry, starts working with students, he likes to share a small tidbit with them—he changed his major in college.

In fact, he changed it twice.

"I landed on chemistry because I realized that chemistry is our central science because it's connected to so many other science and engineering disciplines," Sivey says. "And as I was finishing my undergraduate degree, I realized I wanted to work in environmental chemistry."

He has found his calling and is helping TU students find theirs. Along with teaching, Sivey also leads students in the Aqueous Environmental Chemistry Laboratory at TU.

This lab allows the professor and a select group of students to focus on environmental chemistry and the chemistry of drinking water from areas in the United States.

Sivey's research on drinking water began when he was a doctoral student at Johns Hopkins, where his adviser encouraged him to explore assumptions other researchers in the field were making about the chemistry of the drinking water.

More specifically, he started looking at how U.S. cities treat their drinking water with a little bleach to help kill pathogens that could make people sick. And while usually safe for humans, sometimes the bleach will react with other chemicals in the water and cause disinfection byproducts, which can be toxic.

He now continues this research at TU, and along with integrating students into the research, he integrates the research into his teaching.

"One of the reasons I love being at TU is because my research is part of my teaching," Sivey says. "Whenever possible, I'll pull in examples of research that my team has done and show students

Undergraduate researchers immerse themselves in the chemistry and testing of drinking water alongside professor John Sivey.

that their undergraduate peers are the ones who are making these discoveries.

“One of the special things about TU is that undergraduates are at the forefront of research. Most of the research in my lab has been driven by undergraduates.”

Zolani Grady was initially one of those undergraduate students. He graduated in 2024 with bachelor’s degrees in general and forensic chemistry and is now earning his master’s degree in environmental chemistry.

After spending a couple of years doing research as an undergrad, Grady is now the technical lead for a project and is working with undergrads on research that looks at the trade-offs between opportunistic pathogens and disinfection byproducts in drinking water.

“It’s hard to get your foot in the door sometimes, so having the privilege to do research at the undergraduate level was so valuable,” Grady says. “My work as an undergraduate has influenced how I do research now as a master’s student and makes me a more competitive chemist for future opportunities.”

Grady got involved with Sivey’s lab after taking his analytical chemistry class. It was there the two developed a connection and where Grady got his first big research opportunity.

He likes to describe his professor as a welcoming face in the Science Complex, who will meet students where they’re at and push them toward to their academic goals.

“Being part of this lab was a big deal for me, especially being a minority in the chemistry field,” Grady says. “It’s sort of a feeling of belonging when I have somebody like Dr. Sivey reinforcing I have the skills and capabilities to contribute to what I think is very meaningful work.”

And while Sivey’s research goals are ever expanding—he jokes he has a Word document with 80 years’ worth of research ideas—his goal for students has always been the same: to graduate ready to take on the world and be better than he was at their age.

“When I look back to where I was at the end of my undergraduate career, compared to where some of the students who I have worked with at TU, they’re far above where I was,” Sivey says. “That’s my metric of success. I want students that I get a chance to mentor to really see that the sky’s the limit for them.”

And while many in the university already take notice of the incredible work done by TU’s chemistry department, the outside world is also starting to notice.

Sivey worked with associate professor Keith Reber and three TU student researchers to co-author a paper in the *Nature Water* sci-



***“It’s hard to get your foot in the door sometimes, so having the privilege to do research at the undergraduate level was so valuable. My work as an undergraduate has influenced how I do research now as a master’s student and makes me a more competitive chemist for future opportunities.”***

■ ZOLANI GRADY '24.

tific journal. The paper was also in collaboration with scientists at Johns Hopkins University and the University of Southern California.

It describes new mechanistic insights—that have evaded previous investigations for decades—into how organic compounds transform into toxic byproducts in chlorinated drinking water.

Sivey says research like this is just a small sample of what’s happening at TU. And for many in the Fisher College of Science and Mathematics, it’s a standard mode of operation.

“This paper wouldn’t have happened without Dr. Reber and the expertise of his team,” Sivey says. “It was really exciting to see our students published, and it would never have happened without TU being an environment where there is interdisciplinary collaboration.

“It’s exciting to be at the forefront of pushing students at Towson University to new frontiers of research.” 



## FEATURE STORY

# TU Professor Researches Environmental Issues in South Baltimore

*Nicole Fabricant inspires students through anthropology classes, real-world research.*

BY ABIGAIL EVANS '28

Nicole Fabricant, a professor of anthropology at TU, has been interested in the field since her undergraduate career. She fell in love with the subject because it allowed her to innovate solutions to address inequality and injustice in her local communities.

Fabricant's research interests have evolved to focus on U.S. environmental justice movements, specifically in South Baltimore. There she works alongside the South Baltimore Community Land Trust and Free Your Voice, an organization of young people from South Baltimore conducting research on environmental overburden and building healthier and more sustainable environments.

"Anthropology allows people to learn about different parts of the world and their conditions," says Fabricant. "It gives people a sense of empathy and [ability] to see how important it is to step inside someone else's shoes and walk around in them."

These youth activists inspired her as she watched them drive a massive campaign against a proposal to build the nation's largest trash-to-energy incinerator in Baltimore's Curtis Bay neighborhood. Her interest and passion grew deeper as she met with students like Destiny

Watford '17, who created a "dream team" of lawyers and experts from the environmental justice and public health sectors to amplify youth voices.

Fabricant uses a lens of historical political economy to understand inequality in the world and connect it to South Baltimore. This has generated a new project that dives into the environmental, human health and labor consequences of the coal supply chain—from extraction to export. Through her activism in South Baltimore, she has learned about the human health consequences tied to the city's open-air coal pier, as fugitive coal dust travels as far as nearly a mile away from the industrial site to residential areas in Curtis Bay.

### Painting a canvas together

As part of her research, Fabricant works with Towson University students and local high schoolers to collect and analyze data on environmental justice.

"I love teaching undergraduates because they are quite creative," says Fabricant. "It's like I give them a paint brush and colors and they choose what they want to do with it, and together we create this beautiful painting."

Fabricant's mentorship of undergraduate students interested in similar social and political issues earned her the Award for Excellence in Undergraduate Teaching of Anthropology from the American Anthropological Association in 2024. The award is given annually to highlight and acknowledge anthropology teachers based on student nominations.

"Making connections with students and teaching [are among] the most important things to me right now," says Fabricant. "So to receive an award of this level was culminating and verifying."

Alejandra Mora '21 noted in her nomination of Fabricant that, "Each of her teachings further cultivated my critical thinking skills and pushed my drive to become more involved in my community by organizing against environmental injustices we face in Baltimore. ... She has inspired generations of students to not accept these oppressive systems as the status quo, to realize the classroom is anywhere you step foot in and that no community regardless of size, race or economic standing should be sacrificed. Everyone is deserving of a healthy environment." 

A man with a beard is shown in profile, sitting at a desk and looking at several computer monitors. The monitors display various data visualizations, including charts and code. The scene is dimly lit, with the primary light source being the screens themselves, which cast a blue and green glow. The man is wearing a dark, long-sleeved shirt. The overall atmosphere is one of focused, technical work.

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Towson University  
8000 York Road  
Towson, MD 21252

[towson.edu/research](http://towson.edu/research)

Lolo Gem earned her MFA in 2025 ▶

