LSA

SPRING 2024

PICTURE IN PICTURE

Math 103 students in the Summer Bridge Scholars Program (SBSP) capture images of the course material on a chalkboard. The students reviewed the material before an exam by discussing it with each other and with Paul Horvath, lecturer II of mathematics. SBSP is a seven-week academic program designed to bridge the gaps in opportunity created by inequitable systems in education, and to give scholars a competitive edge as they enter the fall semester. It is offered through LSA's Comprehensive Studies Program. And if you are surprised to see chalk on the board in the digital age, here is a fun fact: 7,600 sticks of chalk are used each year—equaling about 216 pounds—in the Department of Mathematics alone.

It may look like this image was created using AI, but we promise it's an actual photo of two separate people! But you can read more about AI on p. 10.

Scott Soderberg/Michigan Photography

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COVER: *Edge of Reality* by Becky Sehenuk Waite

TOP RIGHT: Doctoral student and curator Lily Jiale Chen invites visitors to the *Detroit's Chinatowns* exhibit to play a game of mahjong.

More Than One Story
Many people from China once migrated to Detroit, creating a vibrant culture within the city. A doctoral student is making sure their stories aren't forgotten.
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Can We Really Teach Machines to Smell?
Short answer: Yes. The longer answer involves statistics, deep learning, and "the nose of Ann Arbor."
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Reality Check
How do mass media, social media, and entertainment media skew our perceptions of the real world?
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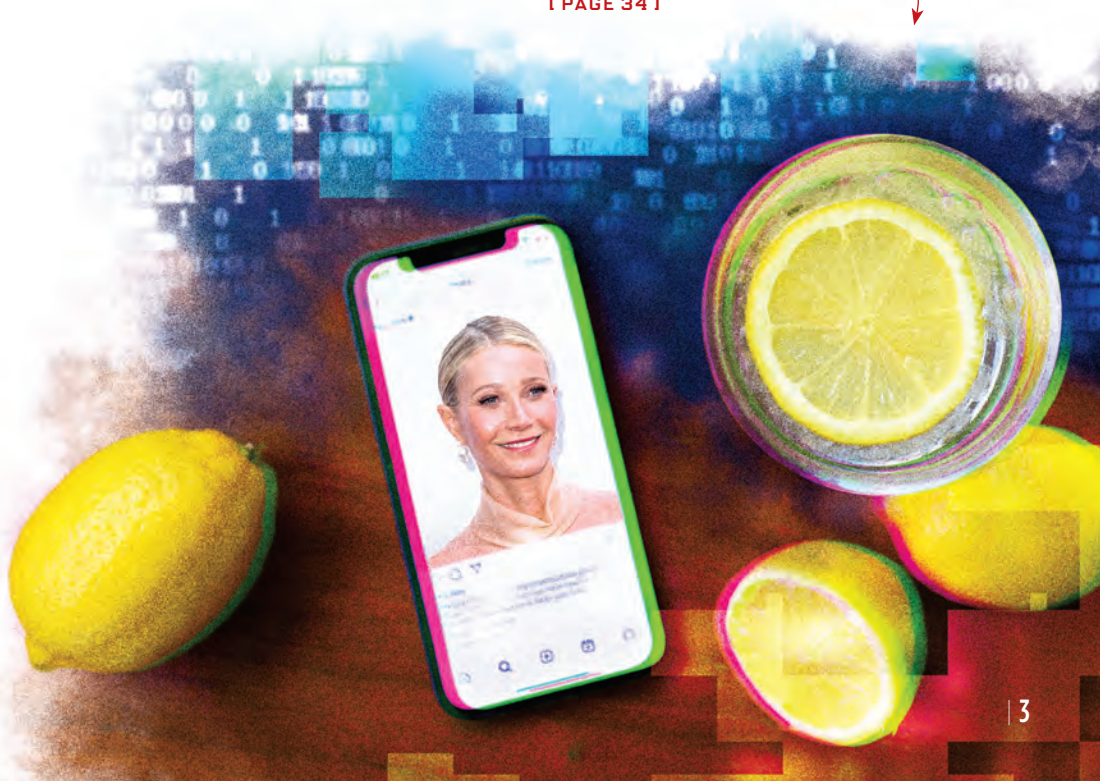


FRONT&CE

Making *Hiss*-tory

LSA's Museum of Zoology acquired tens of thousands of scientifically priceless reptile and amphibian specimens, including roughly 30,000 snakes preserved in alcohol-filled glass jars earlier in the academic year. The new acquisitions boosted the university's collection of reptiles and amphibians to roughly half a million specimens, including some 70,000 snakes. U-M now maintains the largest research collection of snakes anywhere in the world, according to museum curators.

Above: Ecology and evolutionary biology doctoral student Hayley Crowell examines a jar containing a copperhead snake and a garter snake. These snakes are preserved in alcohol and are two of the roughly 45,000 reptile and amphibian specimens the U-M Museum of Zoology acquired from Oregon State University.

Eric Bronson/Michigan Photography

NTER

"A Little Bit of VR Goes a Long Way"

"VR [virtual reality] is not the next smartphone, even if some in the industry disagree with me. The experience should be minutes, not hours; but that doesn't mean that experience can't be special. VR is a transportation machine. It can create or recreate one-of-a-kind experiences. A little bit of VR goes a long way, and even a short experience can have a profound impact."

—Jeremy Bailenson, founding director of Stanford University's Virtual Human Interaction Lab. LSA alum Bailenson (A.B. 1994) spoke at U-M earlier this academic year.

Illustration by DaJaniere Rice

LSA by the NUMBERS

- **21,972 students**
- **11,105 classes**
- **$63 million** in donations to support LSA students and programs
- **$96.8 million** in research funding awarded
- **$229 million** in research expenditures
- **45 million views** of LSA web pages
- **45 countries** hosting study abroad students
- **53 countries** where LSA research projects are being conducted
- **50+ languages** taught
- **154,000 annual visitors** to the U-M Museum of Natural History

—From Dean Anne Curzan's 2023 State of the School address. All numbers are from 2023.

Places referenced in this issue of *LSA Magazine*

- ◀ **Kannauj, India**
- ■ Detroit's Onetime Chinatowns
- ■ Manchester, England
- ■ The Cosmos
- ■ Mount Vesuvius
- ■ La Cañada Flintridge, California

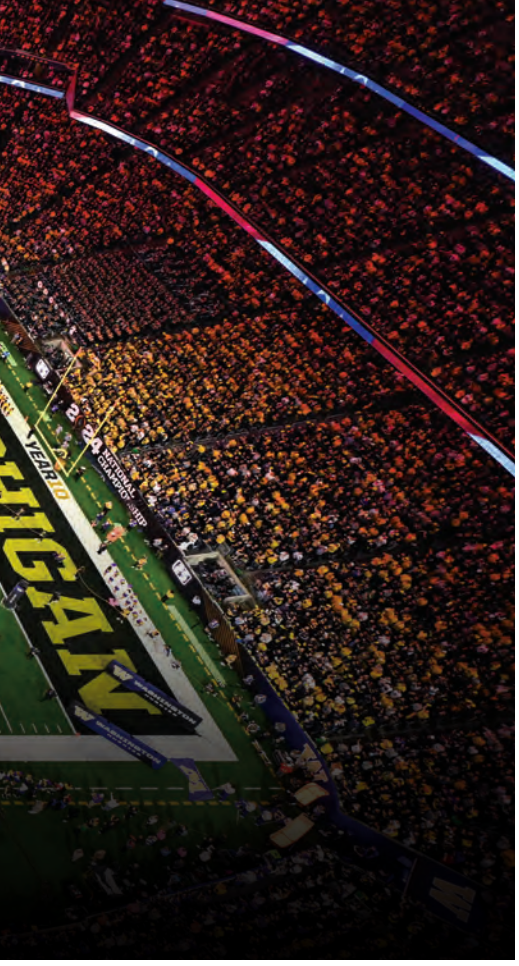
Tuul and Bruno Morandi/Getty Images

Hail to the National Champions!

Here's an under-the-radar story from earlier this year: Michigan won the national championship in football. OK, OK, we know you've heard about it, but we wanted to mark the occasion with photos that may not have been seen as widely as, say, the one with quarterback J.J. McCarthy hoisting the championship trophy.

After all, many members of the football team and the Michigan Marching Band are LSA students, as are countless fans—some of whom braved frigid temperatures to cheer for the returning victors at a parade through campus.

Michigan Photography



POINT OF ORIGIN

"Phillis Wheatley's poems represent the origin point for Black American poetry in print."

—Susan Scott Parrish, Arthur F. Thurnau Professor and professor of English language and literature. U-M has acquired one of the most important American books of the late 18th century—widely regarded as the first book of poetry written by an African American woman. The first American edition of Phillis Wheatley Peters' *Poems on Various Subjects, Religious and Moral* is currently on display at the William L. Clements Library.

New Sensors Measure Michigan's Changing Winters

During the record-breakingly warm winter, researchers at LSA's Biological Station in northern Michigan strengthened their snow science with new technology to track the snowpack at an hourly rate and get a deeper understanding of the complexities of global environmental change. The lab of Aimée Classen, director of the Biological Station and a professor of ecology and evolutionary biology, installed a high-frequency snow-depth sensor at the 10,000-acre research and teaching campus along Douglas Lake at the end of November.

The sensor is powered by a small solar panel and takes measurements hourly. The sensor node was designed by the Digital Water Lab in the U-M College of Engineering to monitor

river depth in watersheds across the state. "Winters are changing, and those changes will impact forest productivity and aquatic water quality," Classen says. "We are working on a high-tech scale-up of our ongoing, on-the-ground, manual monitoring so we can explore how winters are changing across Michigan and the Midwest."

SUPERHEROES THROUGHOUT HISTORY

"Most people don't learn history from academic historians."

—Anthony P. Mora, assistant professor of history, as quoted in the Fall 2023 issue of *History Matters* magazine. He teaches "Heroes and Superheroes in U.S. Popular Culture," which examines hero case studies from Westerns, dramas, superhero comics, films, and television shows—including *Nancy Drew, Zorro, Superman, Wonder Woman, Batman, Spider-Man, Black Panther*, and others—to explore race, class, gender, and sexuality.

FlixPix/Alamy

Nick Love

Humans in Action

The Institute for the Humanities welcomed photographer Devin Allen to campus as part of LSA's fall 2023 Arts & Resistance theme semester and hosted a photo contest, which students could enter for the chance to meet and share their work with Allen. The theme for the contest was "Humans in Action." Psychology student Nick Love, a photographer for Black UMich, won first place with this image from the annual H.E.A.D.S. BBQ at the start of the school year at Wheeler Park. H.E.A.D.S. is an organization that hosts weekly conversations for Black students on campus to foster and create a community and home for Black men, Love says. Pictured are students Kobby Nyankson, Sloane Campbell, and Devin Vowels.

Echoes of 1963

In a three-part online Q&A series, LSA experts discussed how 1963 was a pivotal year in the Civil Rights Movement. Here is an excerpt from an interview with Alford A. Young Jr., a University Diversity and Social Transformation Professor, Edgar G. Epps Professor of Sociology, Arthur F. Thurnau Professor of Sociology, and professor of Afroamerican and African studies, and of public policy.

LSA: How would you describe the work opportunities, or, as you say, the "World of Work" for African Americans during that time period?

Young: The '60s, in particular the early 1960s, was a very interesting moment because nationally, there were more opportunities than today for working-class Americans. That had been the case throughout much of the 20th century, but it certainly got better after World War II and continued afterwards. However, for Black Americans, it was a unique situation because the very work opportunities they had sought in urban cities began to disappear as they arrived there.

Read more: myumi.ch/lsa-1963

Tatum Poirier

A Century of Peonies

Each spring, 100,000 painters, photographers, family picnickers, and fragrance seekers visit the peony garden in the Nichols Arboretum. The history of the garden goes back more than a century: In 1922, the U-M Board of Regents appropriated $2,000 to establish the garden. The collection of herbaceous peonies was being offered by Dr. W.E. Upjohn, an alum of U-M (1875) and founder of the Upjohn Pharmaceutical Company. At its opening to the public in 1927, the garden contained 280 cultivars, and over the next five years another 38 were added. Today, 196 of the original cultivars remain, and up to 10,000 peony blossoms appear at peak bloom each year.

Preventing the Extinction of GREAT APES

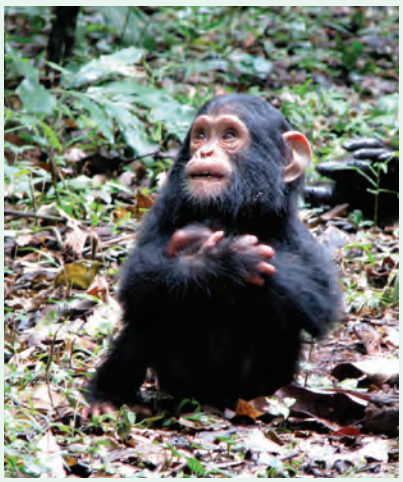
Great apes, humans' closest living relatives, are knocking on the door of extinction. In a Q&A with Michigan News at U-M, LSA researchers John Mitani, professor emeritus of anthropology, and Andrew Marshall, professor of anthropology and of ecology and evolutionary biology, talked about a new study they coauthored and why we must find a way to save apes from extinction.

Marshall: Despite considerable effort and investment in conservation, ape populations are continuing to decline, many of them very dramatically. Five of the seven recognized taxa are now critically endangered.

Rather than focusing on the current plight of apes, which is well known, we wanted to be forward looking and propose things we could do that might improve the situation.

Mitani: There is a moral imperative to do this. These are iconic species that everybody can identify with. This is because they are our closest living relatives and essentially our kin. We're living at a time when we are losing tons of species in a mass extinction event created by us. If we can't save these animals, then there's really very little hope for the rest of biodiversity. I just can't imagine a world without these animals.

Peterson (above) and Susanna (below) were photographed by John Mitani, professor emeritus of anthropology, in Ngogo, his field site in Kibale National Park, Uganda.



HEY SIRI, Are We Cool?

BY LARA ZIELIN

ILLUSTRATIONS BY BECKY SEHENUK WAITE

AI is developing rapidly, and there's no consensus on what that means. Some think it will lead to human extinction. Others point out that it could help address medicine shortages or plan vacations. So what do humans do with all this? LSA faculty and alumni experts weigh in on what to make of AI's changing landscape.

In October of last year, I got an email from my agent saying that one of my published novels had been scraped, i.e. used without my permission to train AI systems by companies like Meta and Bloomberg.

The book—a romance published years ago under a pen name—was just one of hundreds of thousands used to train AI. Lawsuits by authors including John Grisham and George R.R. Martin quickly followed. A few months later, in December, the *New York Times* sued OpenAI and Microsoft for scraping its content as well—in this instance to train AI news bots, with which the paper argued it now must compete.

During the recent Writers Guild of America strike, the world watched as creatives fought for their jobs and benefits, all while executives claimed AI was just as good as humans at creating content.

This all gave me pause. As a writer, was AI coming for me? Would I even have a job in five years—or in one?

At the same time, I knew AI was fueling breakthroughs, including being able to detect some types of cancer more reliably than humans and being able to identify whether drivers might hit the car in front of them.

It was all a little brain-scrambling. Was AI here to help us or harm us?

To get a handle on the AI landscape, I reached out to LSA experts—alumni and faculty in a variety of disciplines and industries—for help and perspective. I asked them to illuminate whether, culturally, we're experiencing the rise of the machines or the dawn of a new day. Or some unblazed trail in between.

Bad DATA In, Bad DATA Out

AI isn't new; it's been around for decades in the form of algorithms that are trained to select pieces of data that they think might be useful to us. Essentially, it's a math problem that is trying to solve for what we want and need—like getting the right ad to pop up in our social media feed, or returning Google results based on where we live.

What launched AI into the daily news and started a new tech arms race was generative AI. In this case, a program like ChatGPT could take data about, say, dolphins and do more than just regurgitate facts. It could write a limerick or term paper about dolphins. It could paint you a dolphin picture, or generate an image of Dwayne "The Rock" Johnson riding a dolphin.

AI was suddenly mimicking humans' cognitive ability to take disparate pieces of data and connect them in new ways.

A University of Michigan committee recently found that 60 percent of faculty and students had used GenAI systems. The committee's report also emphasized the risks associated with a tool that can be used to plagiarize and fabricate as well as the promise of GenAI, which could lead to mind-bending discoveries.

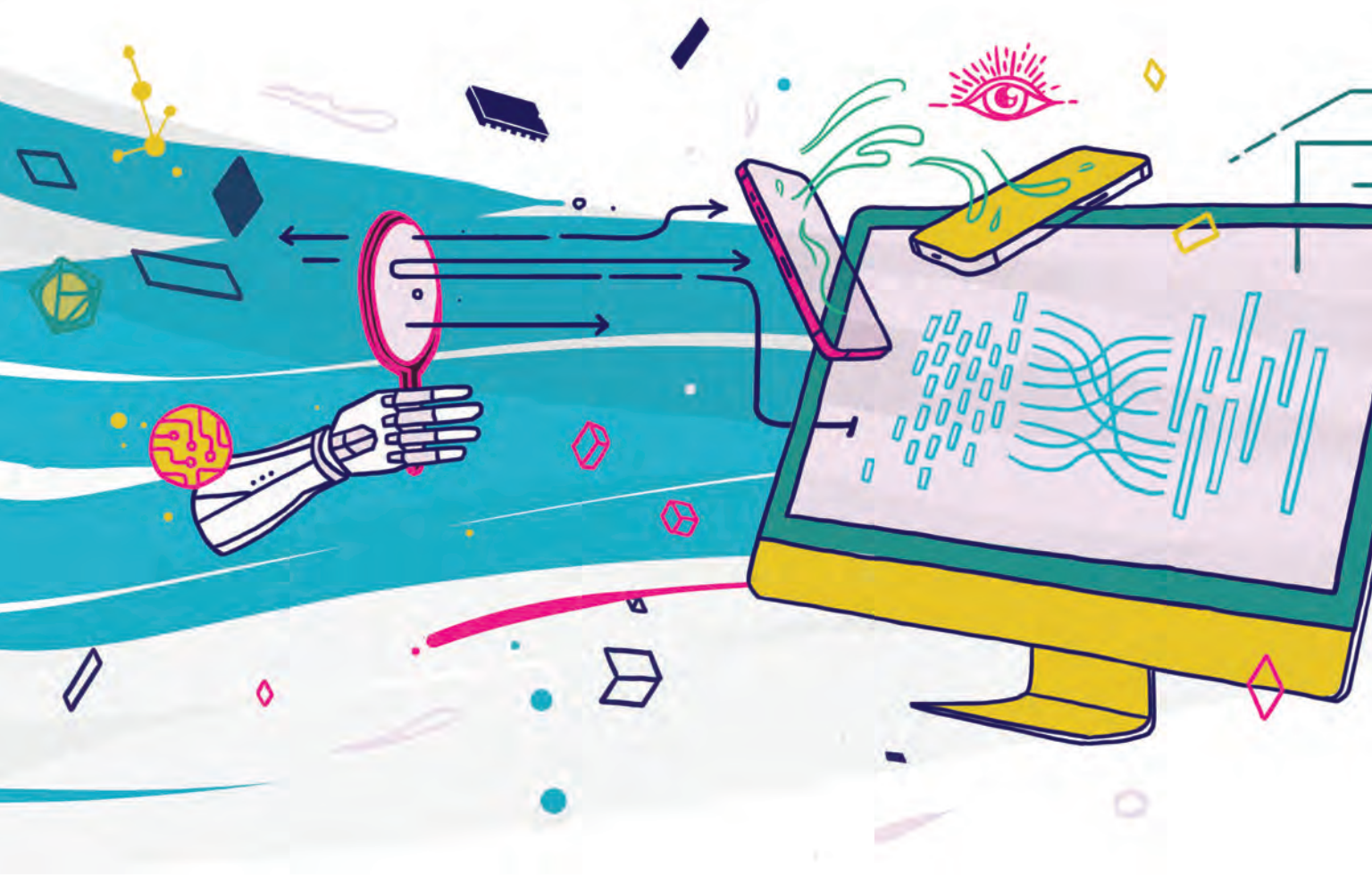
Generative AI was certainly revolutionary, but there were problems right away. Most significantly, there was no guarantee that the information in the dolphin term paper would be right. Or that the dolphin in the picture wouldn't have human hands. Or that The Rock wouldn't have dolphin fins. This is because all the scraping that generative AI does comes from loads of sources that might not be comprehensive or could include faulty information. In other words: bad data in, bad data out.

This isn't a big deal when it comes to dolphin limericks. But there are ways in which AI can replicate and perpetuate harmful biases, according to Apryl Williams, an assistant professor of communication and media in LSA.

"We tend to think of AI as an objective product, a science," Williams says. "It gets complex and long, but at the end of the day it's just math." The problem with that perspective, Williams says, is that it's omitting both where the data is coming from and who is creating the algorithm—and the biases inherent in both.

"The people who are writing the algorithms will create them based on their background, what they learned in school, and their own cultural contexts," explains Williams. "Typically, people who are creating the algorithms are white researchers. They often don't include women, people of color, or people with disabilities."

Williams has seen these biases firsthand in her research on dating apps, which she recently published in her book *Not My Type: Automating Sexual Racism in Online Dating* (Stanford University Press, 2024). By studying patents filed by a large dating company, Williams found the technology may rank people on attractiveness based on European standards of beauty. "So if you're not the ideal Western standard of beauty



or attractiveness, your score will be lower," Williams says. "If you're not small-framed, if your face is not angular, if you don't have blond hair, the algorithm will evaluate you as less than attractive."

And it's not just dating apps. Recently, Bloomberg analyzed more than 5,000 images generated by Stability AI and found that the program reflected race and gender stereotypes. For example, people with lighter skin tones were shown in high-paying jobs while subjects with darker skin tones were shown in jobs like "dishwasher" and "housekeeper."

"The computers learn everything from us," says Jennifer Blum (Ph.D. '11), a director of AI and analytics. "They're holding up a mirror. They only know what they've been taught."

How to Train Your ROBOT

Blum is among the researchers working to improve AI to produce better results, commonly called "training" a model. "You want customers to just be able to use AI and know it's right," she says.

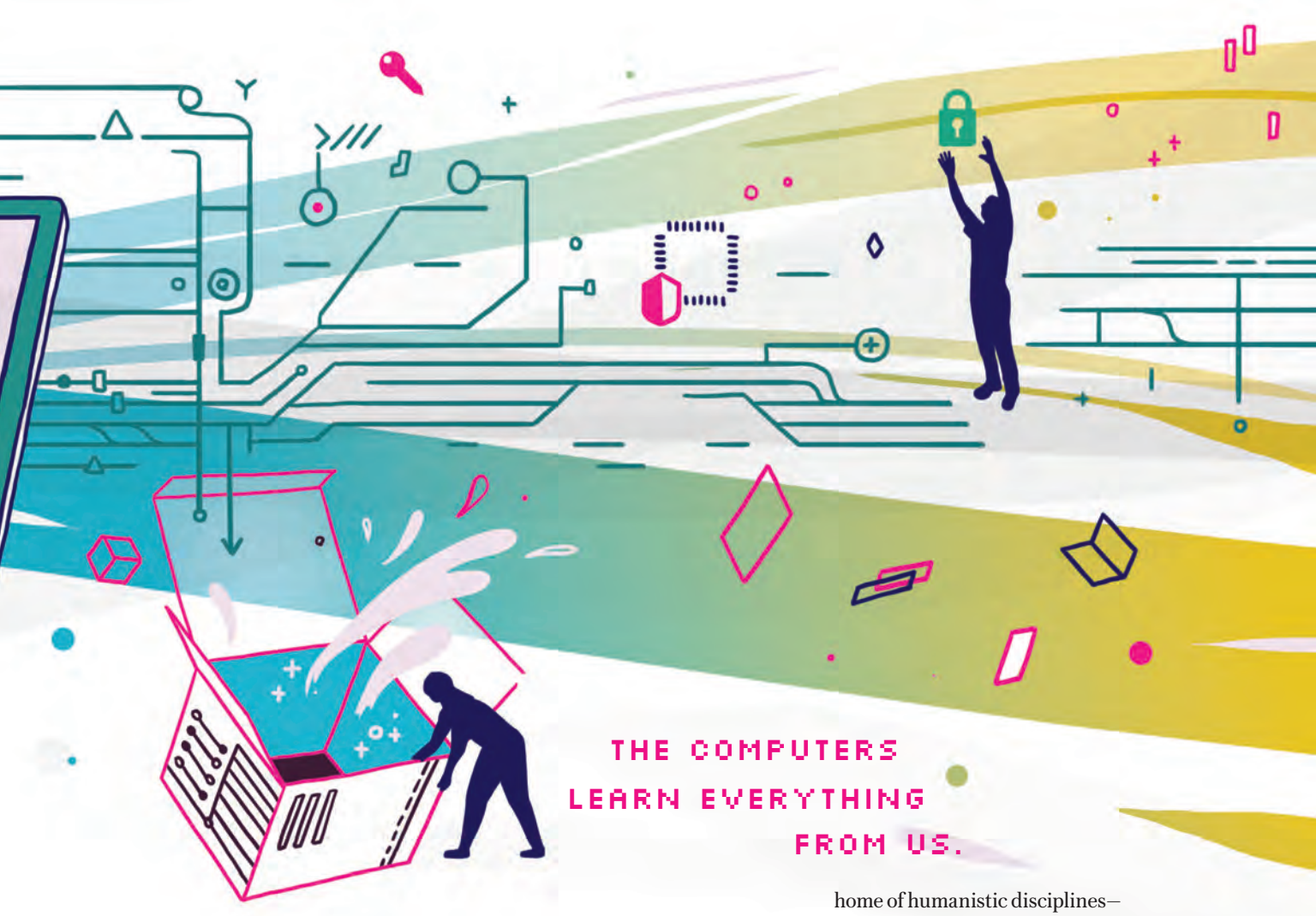
Blum started in cybersecurity, writing code to protect industry networks from hackers. These days, she works for a private company called HII, using AI to help her clients solve an array of problems. At the center of some of her work is "finding the correct data—or making sure the data is good—to teach a computer."

Blum's work, and that of other data scientists, is significant because one of AI's biggest limitations is that it doesn't know when it's wrong. In fact, AI will often go to great lengths to convince users of an answer, even if that answer is wildly incorrect.

"[AI's] goal, when you get down to it, is to fill in the blank convincingly, not correctly," journalist Devin Coldewey wrote in an online article for *TechCrunch*.

Indeed, the reason generative AI produces the answers it does is still a mystery given the billions of calculations it performs. Humans built the algorithm, but somewhere along the line, we lost the ability to explain it.

"We don't quite know how it works," says Chandra Sripada, the Theophile Raphael Research Professor of Clinical Neurosciences and professor of philosophy at LSA. As a result,



scientists are "opening the black box of AI and looking at the steps in its processing. What kind of training is needed to create intelligence? What kind of inputs start to generate its intelligent behavior?"

As it turns out, these questions are tricky when it comes to people, too. "The field of cognitive science has not had a good understanding of how intelligence is generated in humans," says Sripada, also the director of the LSA Weinberg Institute for Cognitive Science. "How does information come into the mind and become mentally represented for other mental processes to use and transform?"

AI, he says, could begin to crack the code. "Now, here is this great model to potentially learn how thinking, creativity, and reasoning work."

AI is also learning so fast, with such vast amounts of data, that there is a question of whether it can evolve on its own. Can AI become so learned that it's aware it contains harmful biases or that its own code is bad? Can it become so smart that it surpasses human cognition and takes over—either for humanity's benefit or its detriment?

"These machines can potentially become so powerful that we may lose our ability to control them," Sripada says. "When you have entities so powerful and have so many upsides that people want to use them, how do you guard against serious downstream risks? There are challenging questions inherent in this work."

He adds that those are the questions LSA is poised to address. "LSA is the home of humanistic disciplines—ethics, political science, and other humanities—exactly the intellectual disciplines that can begin to answer the profound and challenging questions AI presents. The deep scholarly and humanistic interrogation of AI will happen in LSA."

But in order for that to occur, Sripada says U-M needs to show up at the AI table—and fast—like its peer institutions. He cites a recent *Inside Higher Education* article from September 2023 that talks about the ways in which leading universities are funding AI centers and initiatives, and spending money hiring experts in an array of disciplines. "To hold our place as a world-leading institution at the frontier of scientific and humanistic questions, we do need to invest substantially. University-wide certainly, but especially in LSA, in the science and the ethics of AI."

The SYSTEM Dreams in Total DARKNESS

In the meantime, it may be worthwhile to treat AI with a healthy dose of skepticism. "I'm not worried about computers taking over; I'm more concerned about the people using the computers," says Blum. "I'm concerned with people getting lazy, getting comfortable, not questioning what they are reading or seeing."

It's this place of discomfort—of challenge and difficulty—that Jim Burnstein, professor and director of LSA's Screenwriting Program, tells his screenwriting students is at the heart of the creative process. "You'll be trying to come up with that next story and [decide to use AI] to get unstuck, but being stuck is where all of your creative breakthroughs come from," he says. His advice is for writers to not use AI at all.

Webb Keane, the George Herbert Mead Distinguished University Professor of Anthropology, recently co-wrote an op-ed on concerns about use of AI with Yale professor Scott J. Shapiro in *The Spectator,* arguing that AI can "trick users into surrendering their autonomy and delegating ethical questions to others." Specifically, Keane and Shapiro were referring to AI "god-bots," which take on the persona of a divine entity—Jesus, Krishna, Buddha—and answer questions posed by users.

The inability to explain how the god-bot is generating its answers or why—inherent in any AI, as Sripada talked about—may make it look like the bot is channeling the superhuman or divine. "When such ineffable workings produce surprising results, it seems like magic," wrote Keane and Shapiro. "When the workings are also incorporeal and omniscient, it all starts to look a lot like something divine."

Keane and Shapiro also argue that the bots shouldn't be able to speak in "absolutes and spurious certainties. They should make clear they are only giving probabilities."

But regulating what AI can and can't do is a lot like replacing the wheels on the train after it's left the station. Ahead of the 2024 presidential election, for example, there is a proliferation of deepfakes—deceptive audio, video, and still images generated by AI to disrupt voter affinity or turnout.

In their op-ed, Keane and Shapiro implored users not to give any AI authority over their lives, to not connect a piece of code to something superhuman or divine.

Blum is more blunt: "Just don't be stupid about it," she says. "I really worry about people's arrogance. We do all these things to make money or because they're fun and entertaining. But we could benefit from asking if something is a good idea.

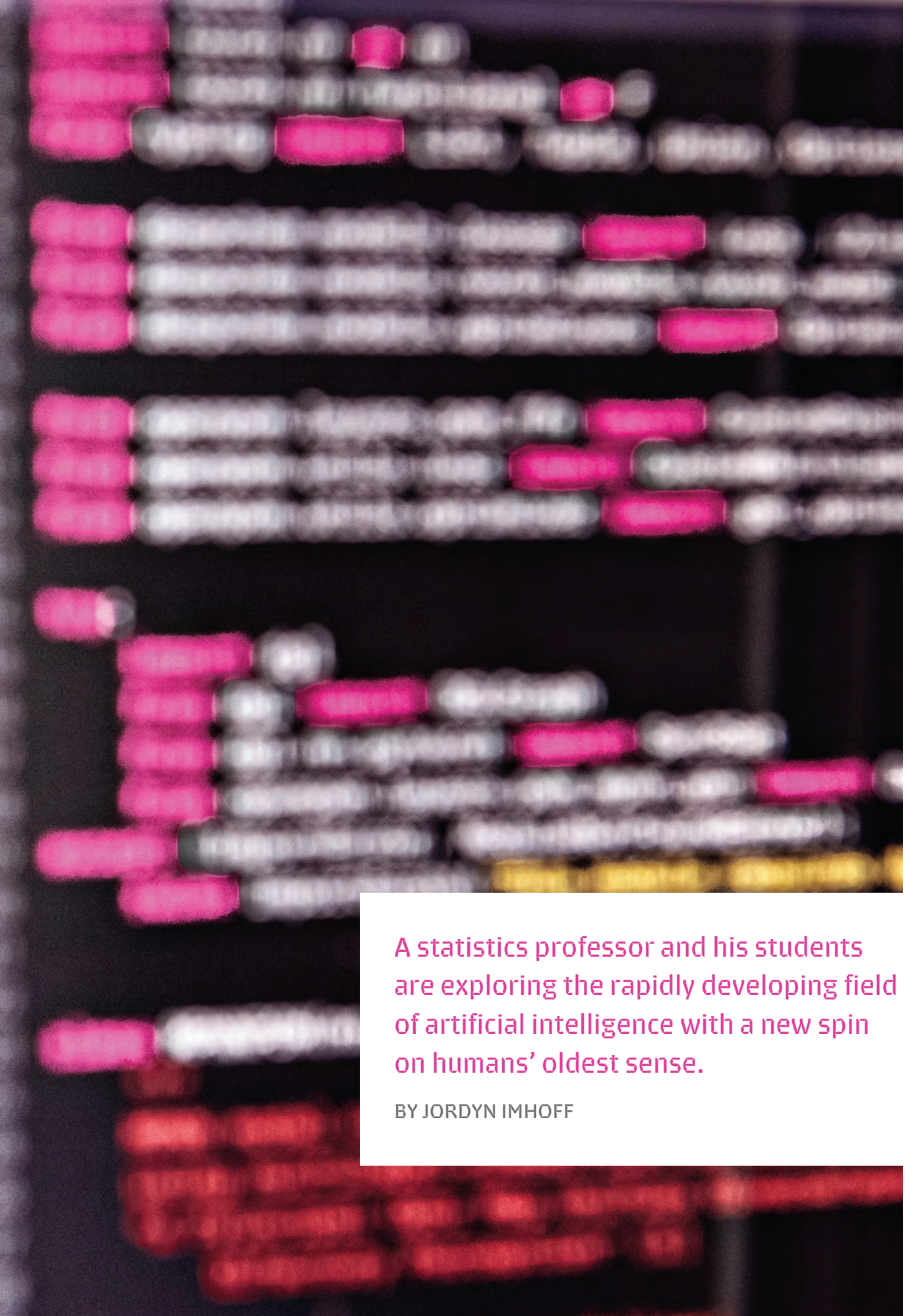
"We could stand to be a bit more humble and a bit more cautious." ■

NO AI WAS USED TO WRITE THIS ARTICLE :)

Can We Really Teach Machines to Smell?

Statistics Prof. Ambuj Tewari reviews computer code.

Leisa Thompson Photography



A statistics professor and his students are exploring the rapidly developing field of artificial intelligence with a new spin on humans' oldest sense.

BY JORDYN IMHOFF

The scene: An ancient city surrounded by the calming, fragrant scent of pink hybrid Damask roses. The soil is particularly well suited for their survival. It's so rich a smell that those who walk through the streets are greeted with the aroma when passing the storm drains. For more than 400 years, those who have lived in India's perfume capital of Kannauj have bottled their "liquid gold," using traditional methods across more than 200 of the country's perfume distilleries.

LSA's Ambuj Tewari, professor of statistics, fondly remembers the sensory wonder of growing up near Kannauj. He recalls visiting family members who worked in the perfume business there and the certain attars, or essential oils, like spicy shamama, earthy khus, and sweet kewda, that take him back.

"As humans, we construct our reality primarily through sight and sound. But olfaction does play a major role in the human experience. The sense of smell is

Statistics Prof. Ambuj Tewari meets with Yikun Han, a master's student in statistics, and Rui Nie, a doctoral student in biostatistics, who have both been inspired by his passion for machine olfaction.

Leisa Thompson Photography

intimately connected with memories. We enjoy fragrances and perfumes, and the flavor of foods and beverages is a complex experience mediated by both smell and taste, but predominantly smell," he says.

Tewari combined his interests—smell, the first sense to develop as part of human evolution; chemistry, inspired by his father's career; and machine learning, a branch of artificial intelligence that seeks to give machines the ability to learn from experience—to embark on an atypical career path.

"I developed an unusual interest, I guess," he laughs. "Over the years, I found myself drawn more and more to machine olfaction, or the automated simulation of the sense of smell."

The automated simulation of the sense of smell? Yes, he's talking about giving a robot a nose, in a way. This could potentially help with testing the quality of food, detecting diseases, finding illicit drugs, and monitoring the environment, among other uses.

If you're picturing R2D2 with a prosthetic nose, that's not exactly right. Tewari's robot is an ordinary computer, but instead of programming it to spit out binary data of ones and zeros, which would be much more typical in a statistics course, he creates a learning algorithm, consisting of common scent categories and descriptors created by the students, that allows his robot to learn and then assess the chemical composition of a molecule. The computer can then tell you, for example, if it would produce a woody and warm or fruity and fresh scent.

A Deep Dive into Deep Learning

Machine olfaction is a field spanning statistics, chemistry, computer science, and engineering. It only started to see major advancements in 2015 at the DREAM Olfaction Prediction

> "Smell is memory, and memory is identity. It's sacred."
>
> —Scent expert Michelle Krell Kydd

Scott Soderberg/Michigan Photography

Challenge, where one research team shared its work on creating predictive modeling with machine learning to determine the smell of a molecule based on its chemical structure. Their findings were published two years after that.

Tewari read the publication with excitement, believing he could replicate the team's work in one of his statistics classes where he teaches students about deep learning. Deep learning is a branch of machine learning that uses algorithms modeled after the human brain structure, called multilayer neural networks, to solve problems like object recognition or playing chess.

He envisioned a reconstructed class where students would smell a variety of molecules and record their perceptions. Then, later in the semester, the undergraduate students would use a machine learning model to predict a human's odor perception from a molecule's chemical structure, just like in the paper.

In Tewari's lectures, students learn about the different branches of AI and ethical issues dominating the public discourse, listen to guest speakers who work in the data science field, and become familiar with popular software tools like Python and TensorFlow that make it easy to create deep learning models. During lab sessions, students line up at benches to interact with smell blotters and document what they think they're smelling, or sit at a computer and practice creating neural networks with smell description tags, with the goal of identifying a chemical composition's projected scent.

To support Tewari's new Stats 315 class, LSA provided funding through the New Initiatives/New Instruction grant. The grant is available to faculty and lecturers who seek to foster student success in innovative ways with inclusive teaching practices.

A Partner in Nose-talgia

You might be asking, why is any of this important in the first place? Why should anyone care about a robot being able to tell if something smells like mint or rotten eggs or a family member's headache-inducing perfume? Actually, there are a lot of reasons that being able to detect smell, naturally or artificially, is important.

Smell isn't only our first sense in terms of human evolution, but "it's the first sense we develop in the womb," according to Michelle Krell Kydd, an Ann Arbor native who was trained as a professional nose at Givaudan, a Swiss manufacturer of flavors and fragrances. "Smell is memory, and memory is identity. It's sacred."

Kydd, who has been referred to as the "Nose of Ann Arbor" and a "walking smell-o-pedia," left a career in tech after the September 11 attacks, realizing she needed to start anew. She decided to pursue an area of interest that was, and still is, a grand passion: the art and science of perfumery.

After following the scent trail, she spent a few years working at a trade publication and meeting perfumers from around the world, after which she worked as a consultant for publicly

Michelle Krell Kydd, the "Nose of Ann Arbor," makes smell kits for the students in Prof. Tewari's class. Kydd was inspired to become an educator and share her passion for smell with others.

traded food and fragrance brands. In 2011, Kydd decided on a new adventure: She gathered her library of flavor and fragrance books and moved to Ann Arbor.

Inspired to become an educator and share her passion for smell, Kydd began creating opportunities for children and adults to learn with their noses, such as "Smell and Tell" events at the Ann Arbor District Library, 826Michigan, and U-M.

"Last year, I found Michelle from a TEDxUofM talk she gave in 2015, and I reached out to her to see if we could work together," Tewari recalls. Kydd, intrigued by the prospect of creating a space for experiential learning in Tewari's department, eagerly signed on and has helped create smell kits for his class.

"Students face pressure to get the best grades, and working in a space that isn't restricted to visual or auditory learning kind of takes that pressure away. It's hard to come up with words to describe smells, but sensory evaluation is subjective and students aren't judged on their answers, because our perceptions of smell are tied to our own unique realities, and it's OK that our realities coexist," says Kydd. "As a matter of fact, it's imperative in life and the classroom."

To Tewari's surprise, more than 100 students from various majors across the college enrolled in the course. While it's true that there has been a growing interest in learning about AI, some of Tewari's former students would say the excitement generated by the class could also be because Tewari is the professor.

Nurturing Niche Interests

"I joined Professor Tewari's lab in my junior year when I was studying statistics and math," says Rui Nie, now pursuing her Ph.D. in biostatistics in the School of Public Health. She joined his lab because of the extensive interdisciplinary research opportunities Tewari provided. When she heard about his machine olfaction project, she asked to join his team so she could practice deep learning techniques.

Over the summer break before her senior year, she expected to continue studying statistical techniques following her professor's guidelines, but instead, Tewari mailed her a book about how the sense of smell is formed in the brain.

"It was so intriguing to me how chemicals interact with receptors in the nose and stimulate neurons, eventually reaching the brain. It was helpful in clarifying biological concepts for me," she says.

> "I think I've realized how the sense of smell is as important as our vision or hearing."
>
> —Doctoral student Rui Nie

Rui Nie, now a doctoral student at the School of Public Health, decided to write about machine olfaction for her honors thesis project after meeting Prof. Tewari.

Nie can relate to Tewari in terms of her connection to scents that remind her of home, reflecting on her experience growing up in China and being exposed to pungent medicinal scents such as tangerine peel and mugwort leaves. Tewari's passion for smell stuck with Nie, who decided to write about machine olfaction for her honors thesis project, for which she was awarded high honors.

"Initially, I was only curious about what Professor Tewari was doing. When I think more deeply about it, though, I think I've realized how the sense of smell is as important as our vision or hearing," she says. "Suppose you're a chemistry student trying to produce a novel chemical through a reaction. You may or may not leak a gas that's harmful to health. How would you know? The human capacity for smell is limited."

Yikun Han, an assistant of Tewari and master's student in the Department of Statistics, was also inspired by the professor's excitement around the developing field of study when considering the next step he wanted to take in his education.

"Professor Tewari's passion for research was the biggest thing that stuck with me this semester. Many times when he shared a new article with us, I could feel the excitement on his face and in his words. Not only in the sense that we could learn from the experience of previous researchers in our subsequent research, but also in his own joy of learning something new," Han says.

After attending a "Smell and Tell," Han expressed interest in continuing to work with Tewari but in a different way: conducting research in the field of machine olfaction. Now doing an independent study with Tewari, Han has helped develop materials for the deep learning class that he hopes will promote outside-the-box thinking, and is excited at the prospect of this becoming a research opportunity when he pursues his Ph.D. in the future.

Leisa Thompson Photography

Yikun Han records his perceptions of an unidentified scent. Han, now an assistant for Tewari's class, became interested in conducting research in the field of machine olfaction after attending one of Michelle Krell Kydd's "Smell and Tell" presentations.

"We're both learning together right now. Compared to his familiarity with machine learning theory, maybe Professor Tewari isn't as sure about which method will work best in this field, looking at machine learning applications. But I think that's the beauty of scientific research: trying to solve problems that you don't know yet can be solved or not," Han says.

"The full picture of olfactory processing in the brain still remains a mystery. On the one hand, we want to understand how olfaction works in the natural world, and on the other hand, we want to build machines that can smell," Tewari says. "One hopes that progress in one area will lead to advances in the other." ■

Alum Has a Sense about the Future

Alex Wiltschko (B.S. 2009) comes from a long line of U-M alumni. When he realized around age 16 that he wanted to be a neuroscientist, he says there was no question he would apply for admission to LSA. From East Hall, he could attend his psychology and math classes without having to traverse too far across campus, and it was in those classes where his interests in olfaction and neuroscience came together. After continuing his studies at Harvard and joining Google as a researcher, he now runs his own company, Osmo, which seeks to digitize smells, like how we generate images and sounds today.

"It is clear now that the subset of machine learning that is deep learning has had a major impact on our society, and it is pervasive. It used to be that there were very few places where you could learn the basics in the field, extend the ideas, and apply them to the real world. But now, for folks that will be working with data or tools that make forecasts or predictions, becoming well versed in this technology is not an option anymore; it is required," he says.

He also says Professor Ambuj Tewari, who is teaching the foundation of deep learning to students who are early in their journey of figuring out their profession or research career, is taking a brave but important bet as an educator on a field that is so early in its development.

> "It is clear now that the subset of machine learning that is deep learning has had a major impact on our society, and it is pervasive."
> —Alum Alex Wiltschko

"You say, 'this is not really formed yet, but it is special. There is something about this that I think is going to be transformative.' That is the way the study of color was in the 1910s and '20s, and the way that molecular biology was in the '50s and '60s," Wiltschko says. "There was a moment where there was barely a thing there and some people took a bet on it to teach people about it. Those are the people that continue to grow what we know as a species."

MORE THAN O

The *Detroit's Chinatowns* exhibit at the Detroit Historical Museum is Lily Jiale Chen's love letter to the older generations of people that paved the way for her own, and an invitation to younger generations of Chinese American Detroiters to say thank you.

Erin Kirkland/Michigan Photography

NE STORY

An LSA student has curated a museum exhibit that celebrates the stories of Chinese Americans in Detroit–from their migration to the present-day community.

By Gina Balibrera

The textbook story of Detroit's Chinatowns might go something like this: Many Chinese people were left in poverty after two wars that Britain waged on China, in which Britain forcibly exported opium into China in exchange for tea. At the end of these two wars, in the mid-1800s, many people from China traveled to the United States, including the metro Detroit area. Today, a centralized Chinatown no longer exists in the city.

Courtesy of Chin Family

Lily Jiale Chen's telling of the story is a much richer version, displayed in three dimensions and in vibrant colors at the Detroit Historical Museum. Chen is an assistant curator at the museum as well as a doctoral student in the Department of American Culture at LSA. A museum provides unique opportunities for visitors to engage with history using all of their senses, Chen says. "You get to occupy a physical space that looks, feels, and sounds like what you're studying."

She recently put her studies into practice in the curation of an exhibit called *Detroit's Chinatowns*. Chen emphasizes the plurality of the word "Chinatowns," explaining there's more than one story to tell here.

For example, as Chen considered how to introduce how people from China arrived in the Detroit area, she had to acknowledge that the story, because of the colonial history, is not neutral. Many people from Taishan in Guangdong province were willing to make the long journey in the mid-1800s to the United States, where many were tricked into indentured servitude and hard labor to build the transcontinental railroad, Chen says.

A 1965 street scene from Detroit Chinatown's Cass Corridor location, at the intersection of Cass and Peterboro.

In the late 1800s, Chinese immigrants traveled the very same railroads to Detroit, where they created communities, faced racism and exploitation, started businesses and families, went to school, had picnics and parades, went dancing, and went to war.

PRACTICAL WORK

That story of migration is just one of many Chinese American stories featured in the exhibit, alongside cheery images of baseball players on Belle Isle in the 1950s, restaurant menus, and a telephone created for the exhibit that speaks many of the different Chinese dialects spoken over the last 150 years in Detroit.

In the exhibit, a timeline from the *Detroit Free Press* glides across a wall alongside photographs curated from family albums, a case of congressional war medals from Chinese American veterans, Miss Chinatown pageant photography, and memorabilia from Chinese restaurants that were home to community organizations.

The objects and words that fill the exhibit space tell many simultaneous, sometimes contradictory stories, filling in blanks in some instances, and raising fruitful questions in others. The room is full to bursting with stories of many shapes: painful, quotidian, personal, and joyful.

Chen says the exhibit "is less about celebrating multiculturalism, and more about how histories of oppression and resilience influence the way we live today." But how to show the nuance, variety, and depth of these stories within the four white walls of a museum?

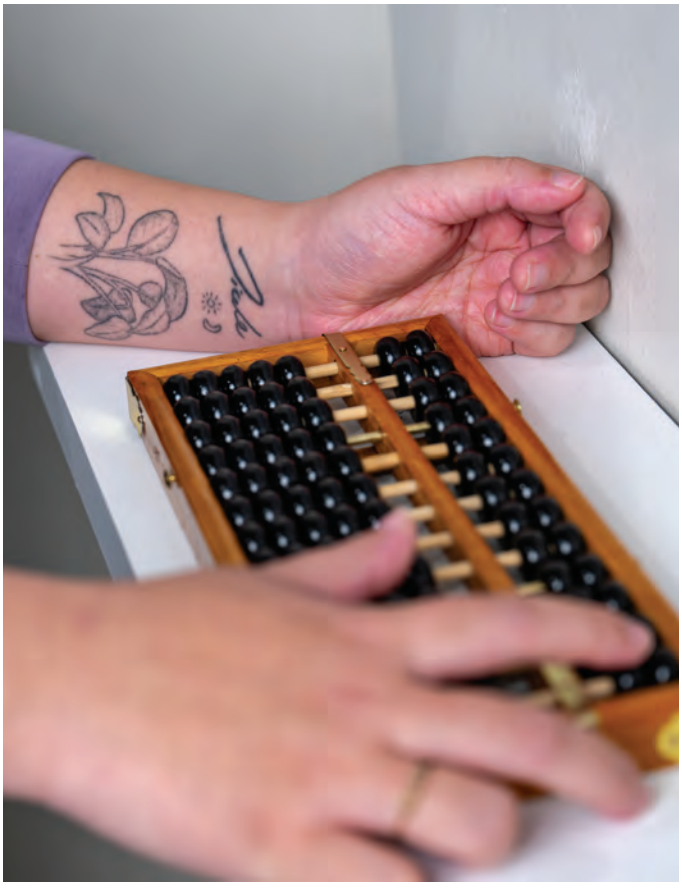
"I had to think really critically about doing it [telling these stories] practically," Chen says.

"I had to ask myself, what does it look like to carry out your dreams, visions, with very limited timespan, very limited budget?"

Working closely with community members, Chen learned that many family photographs were being held in local archives, and she worked with museum staff to return the materials to families. "Something that theorists sometimes miss," Chen says, "is that the practice of museum work provides opportunities to decolonize."

"Chinese Americans have been part of the Detroit fabric since the 1870s, and there have been active efforts to remove and forget."

–Doctoral student Lily Jiale Chen



Clockwise from top: The *Detroit's Chinatowns* exhibit features a kiosk similar to one that once graced the entry to Chinatown before relocation. Lily Jiale Chen holds an abacus from the exhibit, which encourages visitor interaction with the materials. Chinese American youth celebrate in front of the Shanghai Café, circa 1970. The Yee cousins (Jack, Allan, George, Mon, Marshall, Robert, and Dick) play football in 1958 on Belle Isle. Mon, Marshall, and Dick Yee are LSA alumni; Jack is a U-M architecture alum.

Exhibit photos, Erin Kirkland/Michigan Photography. Shanghai Café courtesy of Lim Family. Football photo courtesy of Yee Family.

JUSTICE IN ACTION

Ian Shin, assistant professor of history and American culture and Chen's mentor, was impressed by her dedication to public service and connected her with Roland Hwang (B.S.E. '71, MBA '76), a Department of American Culture lecturer, lawyer, and lifelong Detroit Chinatown community member and legal advocate. Hwang is perhaps best known as one of the founders of American Citizens for Justice (ACJ), the group that led efforts to investigate and prosecute the killers of Vincent Chin in the landmark 1982 hate crime.

In 1982, just days before his wedding, Vincent Chin, a Chinese American Detroiter, was brutally murdered by two white men on Woodward Avenue. Assailants Ronald Ebens and stepson Michael Nitz, after being charged with second-degree murder, pled guilty and no contest, respectively, to manslaughter.

The three years of probation and $3,000 fine meted out by Circuit Judge Charles Kaufman brought about the outrage and consternation of the Asian American community and community organizations like Anti-Defamation League and Detroit Association of Black Organizations (DABO) to create a justice for Vincent Chin movement, and the creation of ACJ.

Hwang vividly remembers the moment after this initial ruling that his outrage turned to action. "I got the phone call from the head of the Chinese merchant's association, On Leong. I was at the Detroit Association of Chinese Americans. We decided to join forces, and that was the birth of American Citizens for Justice," Hwang says.

The action of ACJ, and "the investigation, not by the police officers, but by our pro bono attorney Lisa Chan," Hwang says, revealed witness testimony indicating that the killing had been a hate crime. The discovery led to Chin's murderers being tried in a federal case, one that is recognized for giving birth to the Asian American victims' and civil rights movements. The Vincent Chin story is part of the Detroit Chinatowns exhibit as well, and Hwang's collaboration with Chen helped the curator to shape the telling of this story. And the organizing for Hwang's legal advocacy, it should be noted, took place at the tables of family restaurants such as those represented in the exhibit.

STORIES OF STRENGTH

Connecting with Chinatown community members, especially elders, was key for Chen's research, and Chen found that many community members were eager to share their histories.

The exhibit features the story of another Chin family (no relation to Vincent), complete with family photos of U-M alum Curtis Chin and his siblings sitting as children in front of their famed family restaurant, Chung's. Chin's book, *Everything I Learned, I Learned in a Chinese Restaurant* (Little, Brown, and Co., 2023), shares stories about his family's

In 1982, just days before his wedding, Vincent Chin, a Chinese American Detroiter, was brutally murdered by two white men on Woodward Avenue.

Courtesy of *The Detroit News* Collection, Walter P. Reuther Library, Wayne State University.

REMEMBERING VINCENT CHIN

In his 2016 novel *The Fortunes*, English professor Peter Ho Davies writes about real figures of Chinese American history. To tell the story of Vincent Chin, he imagined the perspective of Chin's friend, a witness to the murder who is haunted by his memories of that night.

"What do I remember? What does anyone remember after all of this time?" the character asks in Peter Ho Davies's novel *The Fortunes*. A reluctant key witness, he goes on to tell the story of that night, of his friendship with Vincent, and of the formation of the American Citizens for Justice in a Chinese restaurant, where he puzzles over questions of truth, justice, and identity in a swirl of shame and shock:

"I sat at the back of those meetings, between the pay phone and the cigarette machine, watching koi gliding silently back and forth in the aquarium."

Later, he must testify in the federal case, and in his stunned, obligatory participation in this historic moment, grief warps memory.

Thorough historical research, including conversations with his LSA colleague Roland Hwang, informed Davies's

Erin Kirkland/Michigan Photography

history in the area, as well as his personal story of growing up in Chinatown and coming out as queer.

Through oral histories and family narratives shared by community members, Chen collected the stories of some of the more difficult experiences faced by Chinese American women in Detroit's Chinatowns, and was struck by their enormous strength.

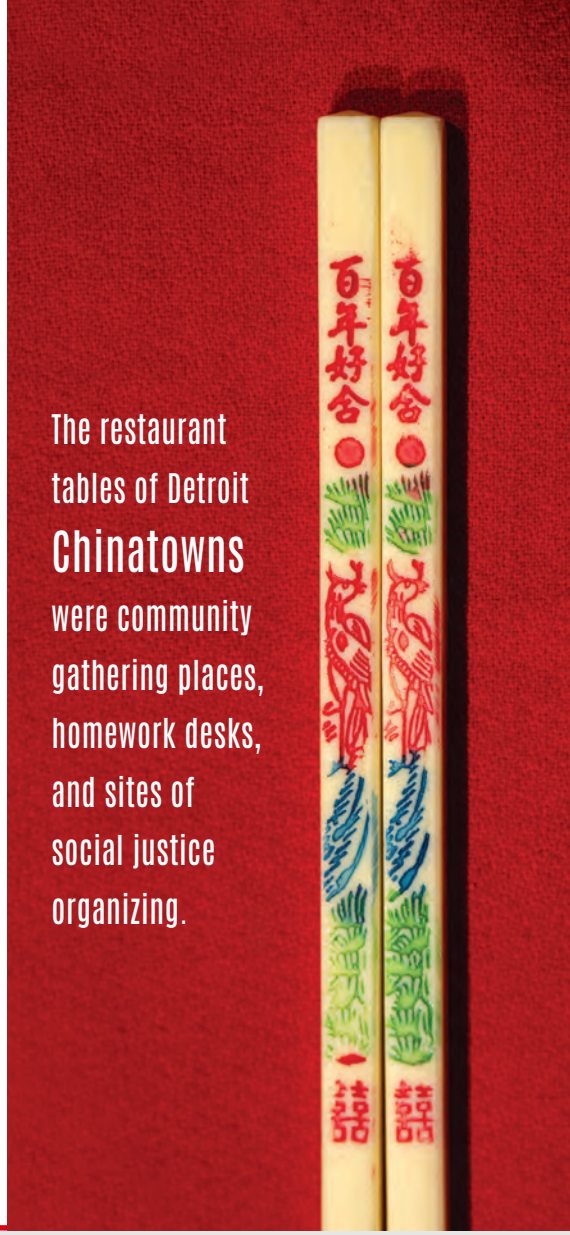
"I wanted to call out how much was carried on the backs of Chinese women for the community to survive," Chen says.

Chen spoke with Carolyn Chin, the granddaughter of Ngan Oi Woo Wong, who, as a single mother of three, ran the Shanghai Café. Their family story is featured prominently in the exhibit and its oral histories.

Top: Ngan Oi Woo Wong in Shanghai Café, circa 1970. Right: Tom Chin with grandsons Chris, Curtis, and Craig, in front of their family restaurant, Chung's, around 1971.

Shanghai Café photo courtesy of the Lim Family. Chung's photo courtesy of the Chin Family. Chopsticks by Erin Kirkland/Michigan Photography.

The restaurant tables of Detroit **Chinatowns** were community gathering places, homework desks, and sites of social justice organizing.



construction of the Chin narrative in *The Fortunes*. But the space of uncertainty, between the public record and the unknowable interior experiences of those who lived it, is where Davies makes Chin's story come alive.

Peter Ho Davies

In an interview with *Fiction Writers' Review,* Davies—the Charles Baxter Collegiate Professor of English Language and Literature—discusses his process of writing fiction inspired by history with LSA's Helen Zell Writers' Program alum Eric McDowell (M.F.A. '13).

Eric McDowell: For you, when is it best to work from your imagination, and when is it best to turn to "the facts"?

Peter Ho Davies: The space between the public life and the private life is a space for fictional speculation to flow into. It fills a gap in the record, without necessarily contradicting the known facts. And in general that's what I look for in historical material, a space of uncertainty that the historical record can't quite account for.

One more thought in this regard. It's always tempting to think of a before-and-after in regard to research, and it would be awfully neat if we could do all the research first followed by the writing. For me the process is more dialectical. I do enough research to inspire myself to write, write until I run out of steam or reach the limits of my knowledge, go back and do more research until I find myself primed to write again, and so on.

Read the entire interview: myumi.ch/RmWbN

Members of the Yee family visit Belle Isle in 1956.
Courtesy of Kathy Yee

TOP: The stories of strength that community elders shared with Lily Jiale Chen guided her curation of the exhibit honoring their lives.
Teapot and mahjong photos by Erin Kirkland/ Michigan Photography

SAYING THANK YOU

Chen's exhibit shows the relocation of Chinatown across Detroit and tells stories about a place where physical landmarks no longer exist. "Detroit has not done a good job preserving historical landmarks," Hwang says. "That bears repeating and contemplation, and this exhibit does that on the neighborhood level, which actually tells the stories of the different families."

Chinese Americans, Chen says, "have been part of the Detroit fabric since the 1870s, and there have been active efforts to remove and forget. The 'urban renewal' that destroyed the Black Bottom neighborhood [a predominately Black Detroit neighborhood that was demolished and replaced by Lafayette Park in the late 1950s] also destroyed Chinatown in the late 1950s and early 1960s with forced relocation to Cass Corridor."

Chen's exhibit does something else a textbook cannot do: It invites participation from visitors. There is a playable mahjong table, an abacus like the ones mid-century school-children would have practiced their numbers on at the Chinese school, and interactive maps that encourage visitors to contemplate their own family's journeys to the Detroit area. On one world map, visitors can place a dot signifying family origins. On another, visitors can drop a chip into a bucket that shows how their family arrived in this area: by sea, by train, or if they trace their origins back to the area, as the Anishinaabe do. "We all come from somewhere," Chen says, "and we come from here, too."

The *Detroit's Chinatowns* exhibit

has affirmed for Chen the importance of place-based work, and she says the work has shown her the critical intersections of the stories of different communities of color.

"We can't talk about Detroit Chinatown without Detroit's Native and Black communities, and what Asian American communities owe the communities that have survived," Chen says. "Our land acknowledgment recognizes that all immigrants come to land and water that have been cared for by Anishinaabe and labored on by Black communities."

Chen says she is committed to holding two things in tension: that museums are inherently colonial institutions, and also radical sites of opportunity, "places where I still dream," she says.

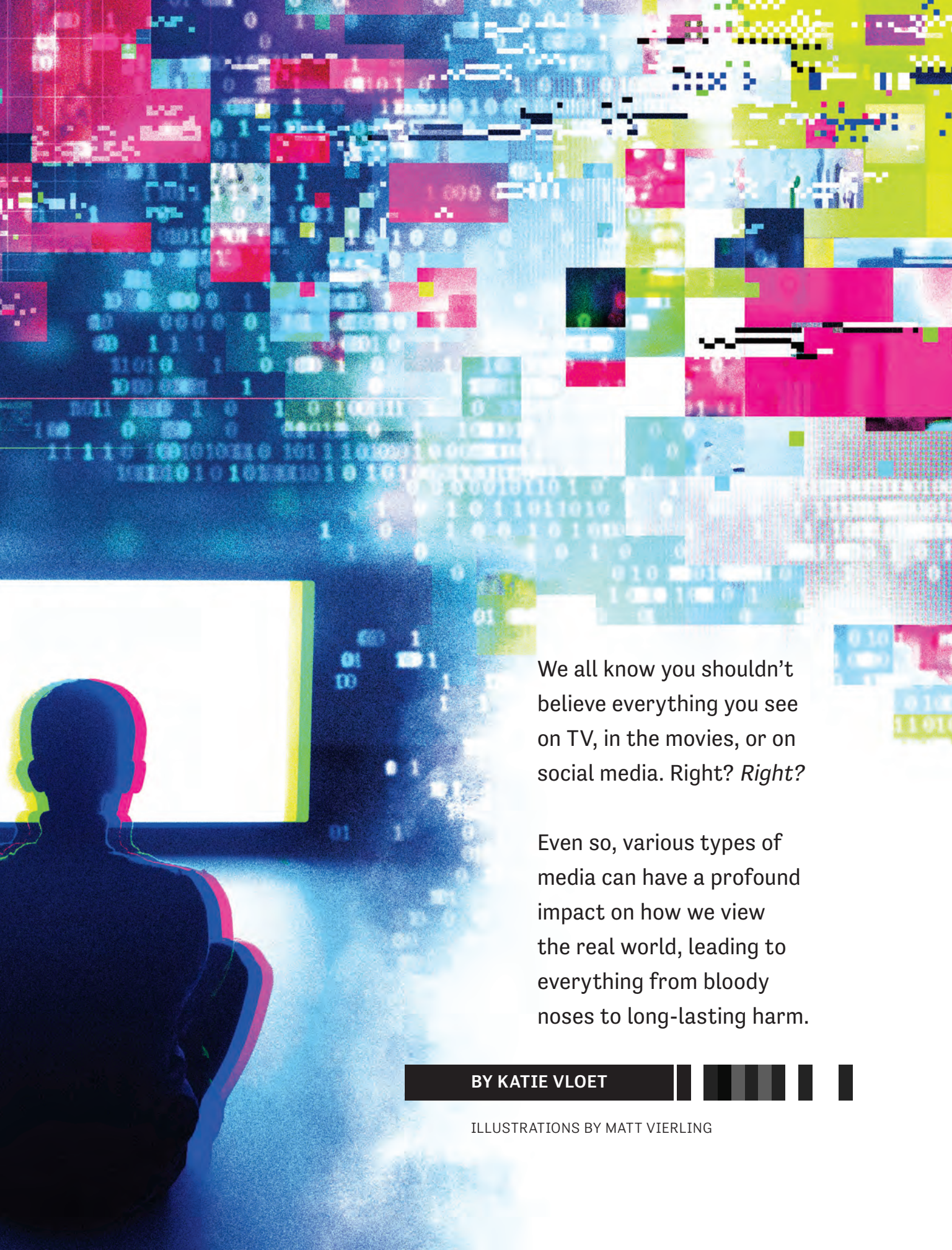
"I wanted to engage people my age or younger to think critically about the generations of people that paved the way for us. Growing up in a suburb of Detroit, as a second-generation Chinese immigrant, it took me a long time to see past my parents' hardship. I faced so much racism that it almost prevented me from seeing the longer history, and how much I owe to older generations," Chen says. "This exhibit is my love letter, my chance to say thank you." ■

Mrs. May Lim and students at the Chinese School of Detroit in 1952.

Courtesy of *The Detroit News* Collection, Walter P. Reuther Library, Wayne State University

"The exhibit is less about celebrating multiculturalism, and more about how histories of oppression and resilience influence the way we live today."—Doctoral student Lily Jiale Chen


REALITY
CHECK



We all know you shouldn't believe everything you see on TV, in the movies, or on social media. Right? *Right?*

Even so, various types of media can have a profound impact on how we view the real world, leading to everything from bloody noses to long-lasting harm.

BY KATIE VLOET

ILLUSTRATIONS BY MATT VIERLING

Kojak: Moviestore Collection Ltd./Alamy

Jan Van den Bulck was 11 years old when he watched an episode of *Kojak* and decided to reenact a scene by having his younger sister tie his ankles together and pretend to toss him in a cell. After all, it had worked just fine on TV.

"I broke my nose. There was blood everywhere," he recalls. "It was a rough lesson on the distinction between the fictional and the real world."

Today, as a professor of communication and media at LSA, he studies that distinction in his research and as faculty coordinator of the Mindless Media: Exposure and Effects Lab. Other faculty and students at LSA also study elements of how mass media, social media, and entertainment media skew our perceptions of the real world—sometimes for worse, occasionally for better. Here are a few examples.

REALITY *BLURRED*

Men are aggressive, competitive, and actively in pursuit of sex. Women are more passive and tend to be driven by emotion and commitment in romantic relationships.

You may have just recoiled while reading those stereotypes. But if you were a teen who watched reality television shows, it's possible that you thought: Yep, that's how it is.

L. Monique Ward, Arthur F. Thurnau Professor of Psychology in LSA, was the lead author on a recent study of adolescents that found watching reality television shows such as *The Bachelor* was associated with a stronger belief in gender stereotypes.

"To me, it said a lot about the power of the genre," says Ward, who points out that researchers did not see the same results in these adolescents based on their viewing of overtly scripted television programs. "We know reality shows aren't completely authentic, but they think it is more authentic."

Additionally, the study suggests that traditional media still have an impact. "People assume traditional media doesn't matter anymore because of social media. No. No, no, no," Ward emphasizes.

And that effect matters. As other studies have found, internalizing these gendered sexual scripts is linked to lower self-esteem, depression, lower academic self-efficacy, and lower sexual agency in girls. Among boys, internalizing these assumptions is associated with "a greater likelihood of accepting sexual coercion or violence against women, of engaging in unprotected sex, and of perpetrating aggression against a dating partner."

Paltrow photo by Xavier Collin/Image Press Agency/Alamy

JADE EGGS AND *POLITICAL INFLUENCE*

Who wouldn't want to be like Gwyneth Paltrow? "Gwyneth is wealthy and thin and beautiful. Her life is neutral tones," says Ariel Hasell, assistant professor of communication and media. Many who follow her on social media might think, "So maybe if I start my day with lemon water every day, my life will be more like hers," Hasell says.

The thing is, it doesn't stop with lemon water. For some people who are fans of Paltrow's aspirational lifestyle brand, Goop, the influence can extend to unproven health practices, cleanses, jade eggs that once purported medical benefits that we don't really need to get into here, and other areas of well-being.

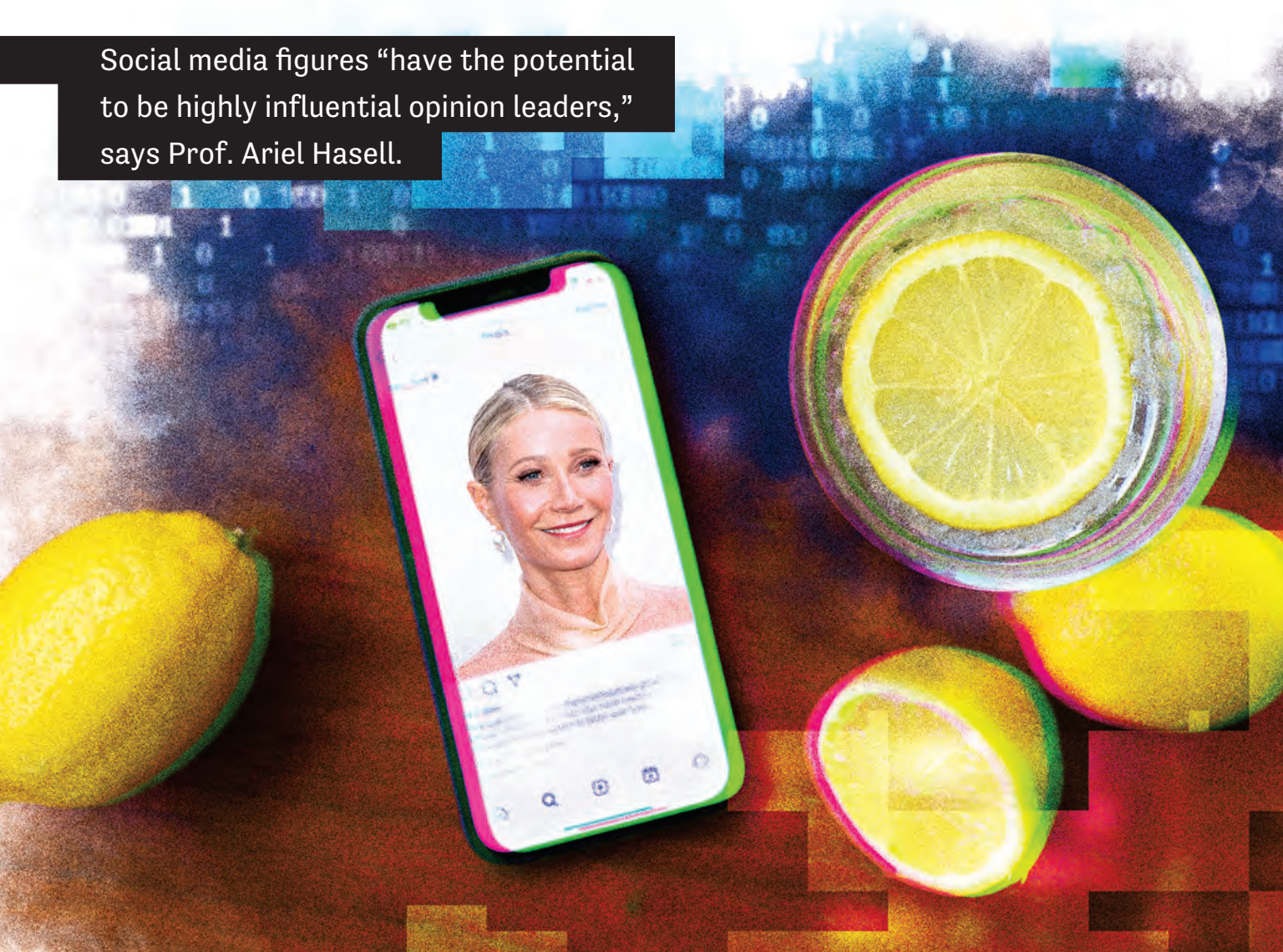
Hasell has also studied the political influence of lifestyle influencers, especially those on social media. While most people do not use social media primarily for political purposes, political messages come through. Once you trust an influencer's views in one area, you may trust their messages on vaccines or conspiracy theories. They also know how to use social media algorithms to their advantage.

"We're in a very low-trust media environment," says Hasell. "If you're an influencer, you can say, 'I found a secret—here's what your doctor won't tell you.' That's going to get a lot more views than if they said, 'You should really talk to your doctor about this.'"

Hasell's research suggests aspirational social media figures "have the potential to be highly influential opinion leaders" and can impact people's political thinking, even if their content isn't explicitly political.

"They are seen as authentic, and that could play a role in the current zeitgeist," she says, referencing widespread anti-expert and anti-institution feelings in the United States.

Social media figures "have the potential to be highly influential opinion leaders," says Prof. Ariel Hasell.



STEREOTYPES AND *GENIUSES*

In the era of three channels on TV and one movie at the downtown theater, people had few options for the kind of entertainment they could experience. Today, with all-but-infinite entertainment options, more diverse representation of minoritized people is possible than the often narrow and stereotypical portrayals of the past. Some have theorized that the diverse representation could be a tool for reducing harmful stereotypes rather than reinforcing them.

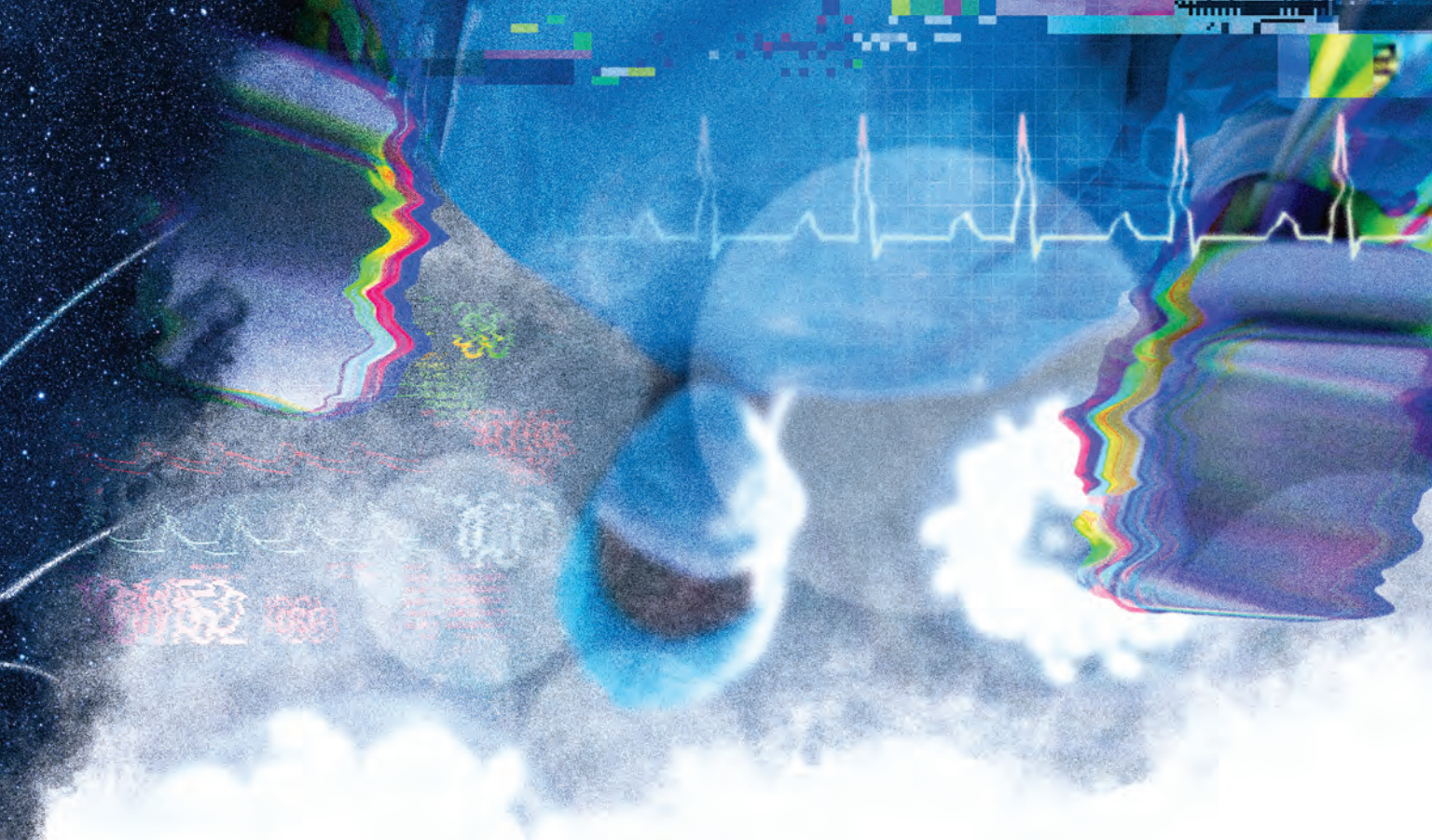
Sonya Dal Cin, professor of communication and media, and Matea Mustafaj, a postdoctoral teaching fellow in the same department, decided to test that theory in a world where we have so much entertainment to choose from. Focusing on the stereotype that men possess greater cognitive abilities than women, they created several television show descriptions across different genres, half featuring a character who was brilliant, and half featuring a character who was not exceptionally intelligent.

They measured participants' existing intelligence-related gender stereotypes, and then asked participants to complete a task in which they selected the shows they'd most like to watch from a few of these descriptions at a time. For each selection, participants saw shows with either all brilliant or all non-brilliant protagonists, half of which were women and half of which were men.

"Our main finding was pretty straightforward: The more that participants associated men with these high-level cognitive abilities compared to women, the less likely they were to choose a show description that featured a genius woman versus one that featured a genius man," Mustafaj says.

One takeaway is that people who could benefit most from non-stereotypical representations are less likely to be exposed to them because of the programs they are inclined to select. Still, because there are so many factors that go into media selection, there's a chance that entertainment media can disrupt stereotypes. If a person who holds a preconceived stereotype of men being smarter than women chooses to watch a movie like *Hidden Figures* because they are interested in the history of the space race, they will be exposed to characters who don't fit the stereotype, Mustafaj says.

©Levantine Films/ Entertainment Pictures/ ZUMAPRESS.com/Alamy



ALL CLEAR?

Van den Bulck, the *Kojak* reenactor from the start of the story, has conducted an experiment with students in which he brings a deactivated defibrillator into the classroom and asks for two student volunteers. Two students who have never used a defibrillator, to be precise.

Invariably, the stand-in EMT holds the paddles, yells "Clear!", and places the paddles on the other person's chest. The faux patient curves their chest outward and is brought back to life. They've done it just as they've seen it on TV and in movies, from *ER* to *House* to *Mission: Impossible* to *Casino Royale.* And it's exactly ... wrong.

"On one level they know they're getting this from fiction. On another level they think they're getting something from the real world," says Van den Bulck, who once trained as an EMT.

In his classes and the Mindless Media: Exposure and Effects Lab, Van den Bulck looks at the unintentional impacts of media on our thoughts, feelings, attitudes, and behavior. How much TV do you usually watch? How often do you pull out your phone to check your social media? "This is impulsive behavior we don't really think about a lot of the time," he says. The lab also looks at the social construction of reality through media—what it would be like to go to prison, for instance, or to use a defibrillator, based on what you've seen in the media. And how does all of this affect your behavior and sleep, for instance?

"One thing I want to emphasize is that, when we think about media effects, we think it has to be negative," he says. "That doesn't have to be true." An LGBTQ+ teen in a small town may feel understood for the first time when they watch a TV show with characters who are LGBTQ+. And media can serve as a mood enhancer when someone wants to relax.

"The more important thing," he says, "is just to be aware that we are being mindless, and the fact that our mind is open for little influences when we aren't fully paying attention." ■

"One thing I want to emphasize is that, when we think about media effects, we think it has to be negative. That doesn't have to be true."—Prof. Jan Van den Bulck

This seemingly mundane artifact found in a coal mine in 19th century Great Britain would become important, Prof. Matt Friedman realized, after discovering that it could unlock clues about brain evolution in a group of fishes that existed more than 250 million years before dinosaurs became extinct.

Eric Bronson/Michigan Photography

The World's Oldest Preserved Fish Brain (We Think)

The accidental discovery of a 319-million-year-old fish brain highlights the beauty of curiosity-driven research and the importance of museum collections.

Illustration by Márcio L. Castro

An artist's rendering of the 319-million-year-old *Coccocephalus wildi*. The fossil is the only known remains of that fish species, holding the key to its evolutionary history in the middle of its skull.

SERENDIPITY: the unexpected finding of something pleasant or fascinating. It's like finding a $20 bill in your jacket, or discovering penicillin after noticing a weird substance inhibiting the growth of *Staphylococcus* bacteria in your petri dish (thank you, Alexander Fleming). For LSA's Matt Friedman, serendipity involved the fortuitous uncovering of what may be the world's oldest preserved fish brain.

Friedman, a professor in the Department of Earth and Environmental Sciences and director of the Museum of Paleontology in LSA, has long been interested in the evolutionary history of fishes, spanning the last 400 million years. In 2012, his research took him to Manchester, England, where he worked on a project involving scanning fossil fish skulls from around the time dinosaurs went extinct and mammals started diversifying.

While sifting through collections at the Manchester Museum, one of the United Kingdom's largest university museums, Friedman's intellectual curiosity led him to zero in on one particularly intriguing fossil of a *Coccocephalus wildi*—a ray-finned fish and ancient cousin of today's tuna, goldfish, and salmon. The fossil is the only known remains of that fish species.

"It was an old fish, much older than the fossils I went to the Manchester collection to examine," he says. "But it was intriguing and I asked to borrow and CT scan it."

When Friedman scanned the fossil, he was disappointed to find "a bit of a dud" and moved on to other fossils. Years later, he started a new

"Not all discoveries in paleontology are made in the field. With new techniques, we can revisit past work and test previous ideas with new eyes."—MUSEUM OF PALEONTOLOGY DIRECTOR MATT FRIEDMAN

job at U-M and asked for permission to take the relic back with him, despite these unimpressive results. And upon a second look after investing in a new scanner for his lab, he saw something odd in the computed tomography [CT] images: a bright, bilaterally symmetrical feature in the middle of the fish's skull.

"Its brightness signified it was something dense, which was unusual. In fact, this feature was denser than both the rock and fossil bone," Friedman says. "I said to myself, 'I think I have a brain inside this fossil.'" Paleontologists often look at the "hard stuff" like bones, teeth, and shells, he says, but the preservation of "soft stuff"—the tissues—is rarer.

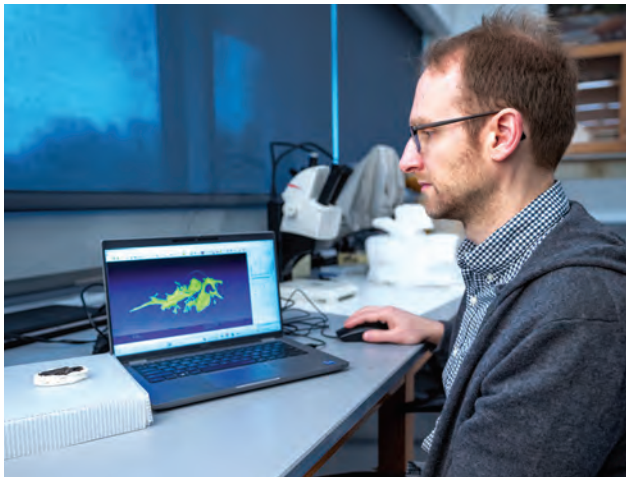
This discovery would've been captivating because of that fact alone, but it was even more surprising because of where and when the fish skull was found: in a coal mine in 19th century Great Britain. Since coal deposits were worked by hand rather than machine, the fossil wasn't ground up, so it could be noticed by workers. At the same time, this seemingly mundane artifact was important because Friedman would realize it unlocked clues about brain evolution in a group of fishes that existed more than 250 million years before dinosaurs became extinct.

After it left that coal mine, the fossil eventually found its home in the Manchester Museum collections.

"The fossil could be seen as disconnected from human enterprise, but it was actually intimately bound up with the economy and geopolitics at the time," Friedman says. "It's a reminder that nothing we do in science is divorced from how we interact with people."

FROM RIO TO ANN ARBOR

The discovery also inspires Rodrigo Figueroa, a doctoral student interested in fish evolution who began working with Friedman several years ago.



Despite his first scan of the fossil being "a bit of a dud," Museum of Paleontology Director Matt Friedman asked for permission to borrow the relic years later and scan it again at U-M. Upon a second look, he found what looked like a preserved brain.

Eric Bronson/ Michigan Photography

"It doesn't matter how much we look at living creatures. We have to look at fossils to understand the big picture, to understand where we come from and the evolution of life on our planet," Figueroa says. "It's such an interesting fossil in that it proves wrong what we thought about ray-finned fishes. This brain is similar to other backboned animals instead of ray-finned fishes."

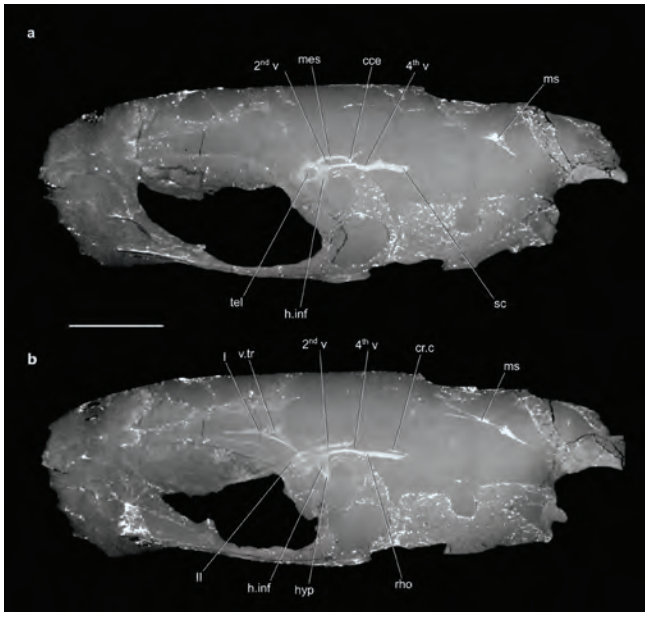
Figueroa, who knew he wanted to be a paleontologist ever since he was a child, was in his first year of undergraduate studies in Rio de Janeiro when he started looking for a lab where he could work, in hopes of gathering paleontology experience.

Although he found a lab where he could assess different fossils, Figueroa was interested in specimens that the lab didn't offer. He decided to take to social media, explaining he's an undergraduate student in Brazil looking for help identifying fossil shark spines from his country. Friedman saw Figueroa's post in a paleontology networking group on Facebook and reached out, offering to collaborate. The pair worked together virtually for four years, until a trip was planned to visit and work more closely with Friedman at U-M in 2018, while Figueroa was working on his master's degree.

"I was scared. I had never been to the U.S. and I couldn't speak English well," Figueroa recalls. But the chance Friedman and Figueroa took on each other resulted in an exciting partnership, where the two learned from and studied with each other. As he analyzed the fossils in U-M's Research Museums Center, including the *Coccocephalus wildi* fossil, Figueroa, who will start a postdoctoral fellowship at Harvard in the fall, developed a new interest in ray-finned fishes, soft tissue preservation, and brain evolution.

Friedman and Figueroa published findings on the extraordinary preservation of the fish's soft tissue and its brain evolution in *Nature*, alongside co-authors Danielle Goodvin and Matthew A. Kolmann from U-M, Michael I. Coates and Abigail M. Caron from the University of Chicago, and Sam Giles from the University of Birmingham.

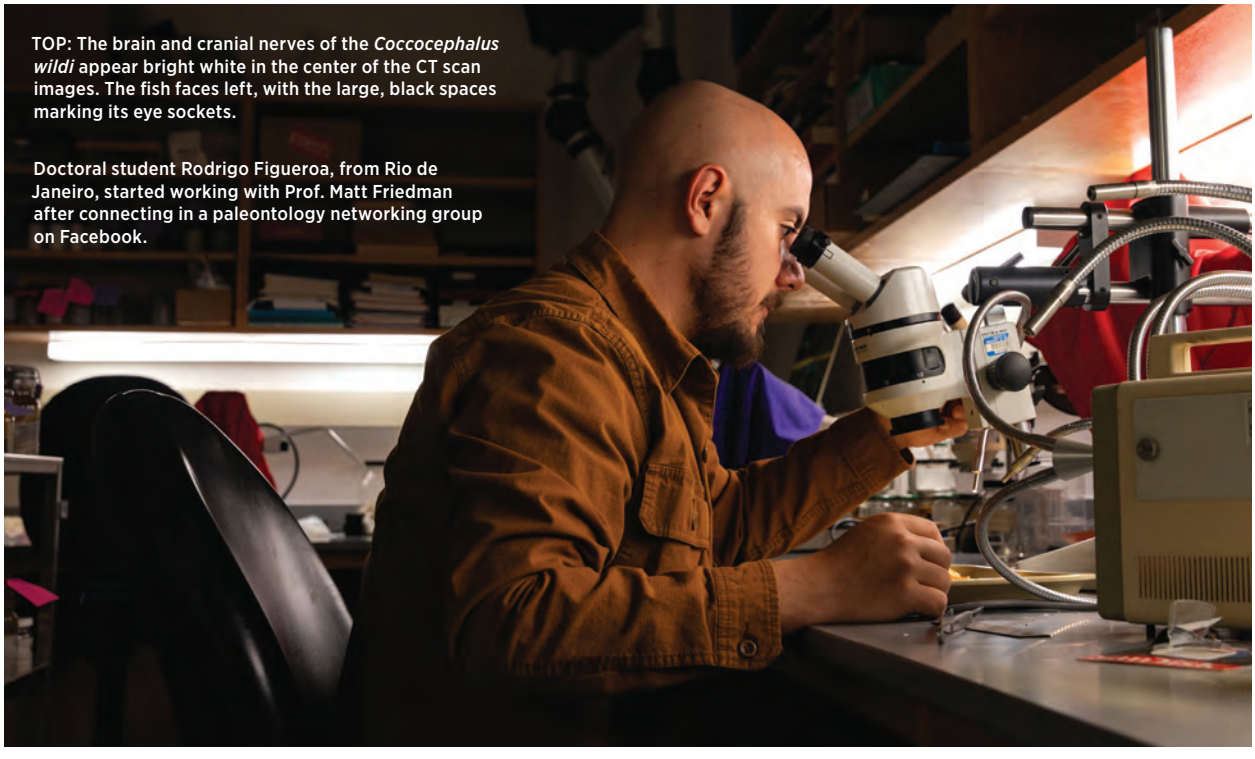
"I think this discovery reinforces the significance of curiosity-driven research. I didn't scan this fossil because I had a hypothesis I wanted to test. It was just invigorating, intellectually," Friedman says. "This discovery also shows the importance of museum collections. Not all discoveries in paleontology are made in the field. With new techniques, we can revisit past work and test previous ideas with new eyes. That's what science is, revisiting things. And we may accidentally answer questions we didn't even know we had." ■



Courtesy of Figueroa et al. in *Nature*, February 2023

TOP: The brain and cranial nerves of the *Coccocephalus wildi* appear bright white in the center of the CT scan images. The fish faces left, with the large, black spaces marking its eye sockets.

Doctoral student Rodrigo Figueroa, from Rio de Janeiro, started working with Prof. Matt Friedman after connecting in a paleontology networking group on Facebook.



Tatum Poirier

ALUMNI BY GINA BALIBRERA

5 Questions With ...

... Paul Farber, alum and director of Monument Lab, who, as curator-in-residence for the U-M Arts Initiative, is collaborating with U-M to explore the relationship between the art museum's historic building, the land it stands on, and the "living force" of history.

Paul Farber is the first curator-in-residence for the U-M Arts Initiative. In this position he explores the role of public art and experience on campus, using public art to weave together various campus communities around topical issues and leveraging art as a bridge between U-M and residents of Southeast Michigan.

Liz Barney/Courtesy of the University of Michigan Museum of Art

OVER THREE YEARS AGO, LSA American culture alum Paul Farber (M.A. '09, Ph.D. '13) and a team of researchers audited nearly 50,000 U.S. conventional monuments. He's found that these monuments shape public perception of historical events, even though many do not tell the whole story. He founded Monument Lab in the name of public service, envisioning a world described in the organization's value statement, in which "monuments are dynamic and defined by their meaning, not by their hardened immovable and untouchable status." Now, in a new collaboration with the University of Michigan Museum of Art (UMMA), Farber invites the college to create public symbols of joy, regeneration, and repair.

LSA: In 2020, Monument Lab was awarded a grant by the Mellon Foundation to support the production of a definitive audit of the nation's monuments—a project that garnered widespread attention. What were your findings?

Paul Farber: The National Monument Audit, a 2021 study produced in partnership with the Mellon Foundation, offered a composite portrait of the ways we as Americans have shaped our monument landscape across generations. The study set included conventional monuments from all 50 states, U.S. territories, and numerous Tribal communities. Our audit drew on sources from federal, state, municipal, Tribal, institutional, and other publicly available sources.

As for the key findings, we summarized them like this:

- Monuments have always changed.
- The monument landscape is overwhelmingly white and male.
- The most common features of American monuments reflect war and conquest.
- The story of the United States as told by our current monument landscape misrepresents our history.

In conducting this audit and discussing its findings with people from around this country

and beyond, we have been inspired by the ways place-keepers and stewards of memory have utilized this research in the service of the work they are doing to reimagine our public spaces.

LSA: You're an alum of LSA's American culture department. Did your studies help you arrive at the founding of Monument Lab?
PF: My experience as a doctoral student in American culture guided me toward questions of memory and memorialization. I wrote my dissertation on American artists and the Berlin Wall, which became my first book, *A Wall of Our Own* (The University of North Carolina Press, 2020), in part because I found myself curious about the pieces of the dismantled wall installed in public spaces around the U.S. and other global sites. More broadly, I learned from a remarkable group of mentors, colleagues, students, and visiting artists who helped me understand the ways monumental histories live on and off pedestals, and to witness history as a living force.

LSA: You and the artist Cannupa Hanska Luger have been working on a multi-year collaboration with UMMA to examine the stories of the university's founding, which has culminated in an exhibition called *You're Welcome*. Can you share the story of this collaboration?
PF: Cannupa Hanska Luger's artistic practice is generative and generous. We began speaking during the early days of the pandemic virtually, and met for the first time in person in Ann Arbor for this project. Together, we, along with UMMA curators and staff, aimed to channel our energy toward an active reflection on and experimentation with the campus's architecture.

LSA: *You're Welcome* includes an exterior commission, a gallery exhibition, and a public classroom. Can you describe how these three pieces of the exhibition converse with each other in the UMMA space, and ideally, how a visitor to the museum might interact with the exhibition?
PF: The common thread through this exhibition is a central question: How do we remember on this campus? Each component of the exhibition responds to that question in a different manner, but with a shared dynamic of marking and remixing official and unofficial modes of memorialization. This includes an experimental commission on the facade of Alumni Memorial Hall, an installation including Cannupa's artworks "consuming" artifacts from UMMA's collections related to extraction and landscape, and a Monument Lab Public Classroom where visitors share their own responses to the central prompt.

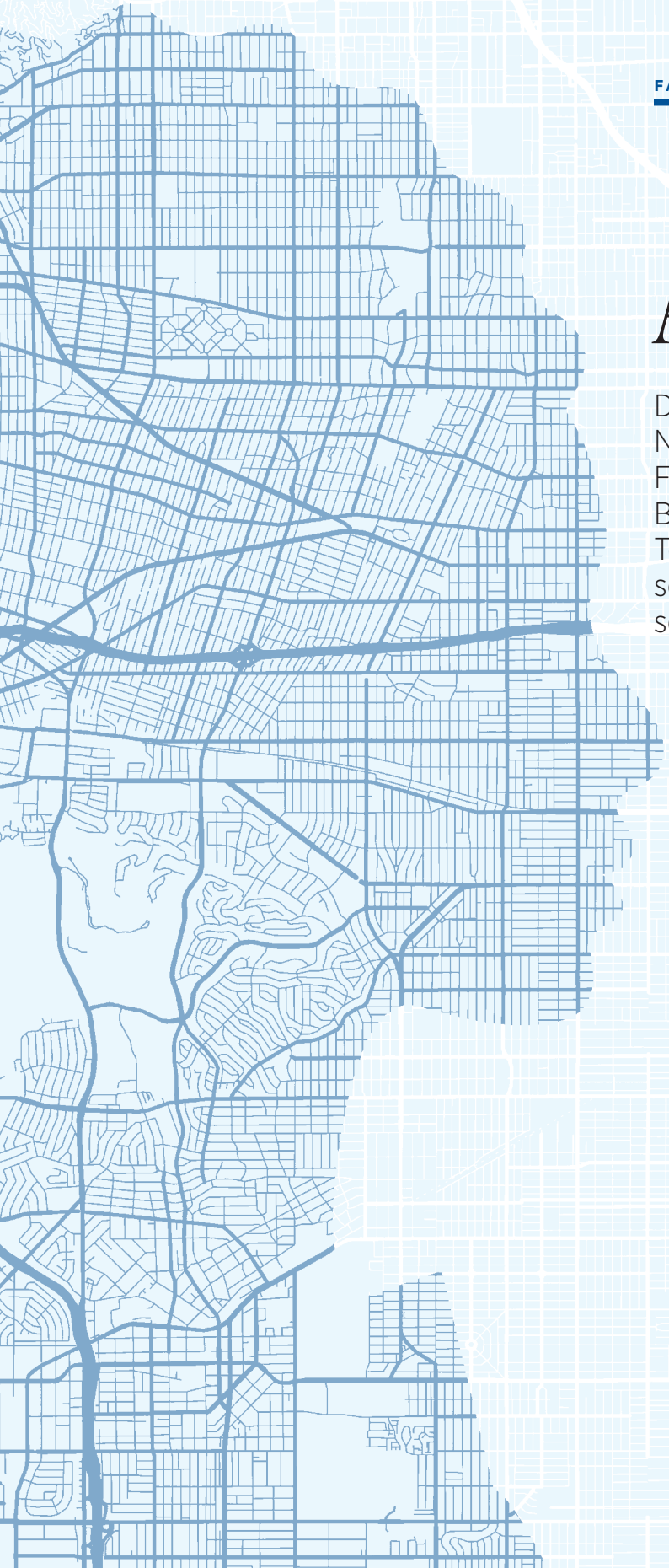
Our hope is that visitors not only take in the artworks but see themselves as part of a campus history that is constantly in flux.

You're Welcome is a collaboration between former UMMA curator Ozi Uduma (A.B. '14), left, who co-curated the exhibition with Monument Lab founder Paul Farber, right. They are pictured here on the steps of the museum with artist Cannupa Hanska Luger, center.

Ian Solomon/Courtesy of the University of Michigan Museum of Art

LSA: What do you believe the power of memory in public spaces is? Said another way, what responsibility is attached to remembrance?
PF: We are constantly living with and shaping our history, through the places we live, travel, extract resources, and leave imprints. Our responsibility is to labor to grapple with the lessons and burdens of the past, and to use those reflections as ways to live more fully, equitably, and sustainably now and onward. Remembrance is not just about separating the past, present, and future, but to weave together those distinctions through our actions and relationships. ■

This interview has been edited for clarity and length.



FACULTY BY ANNA MEGDELL

At Sundown

Dearborn, Michigan. Levittown, New York. Decatur, Illinois. La Cañada Flintridge, California. LSA's Stephen Berrey and students of the Sundown Town Project say these towns have something in common: their historical segregation practices.

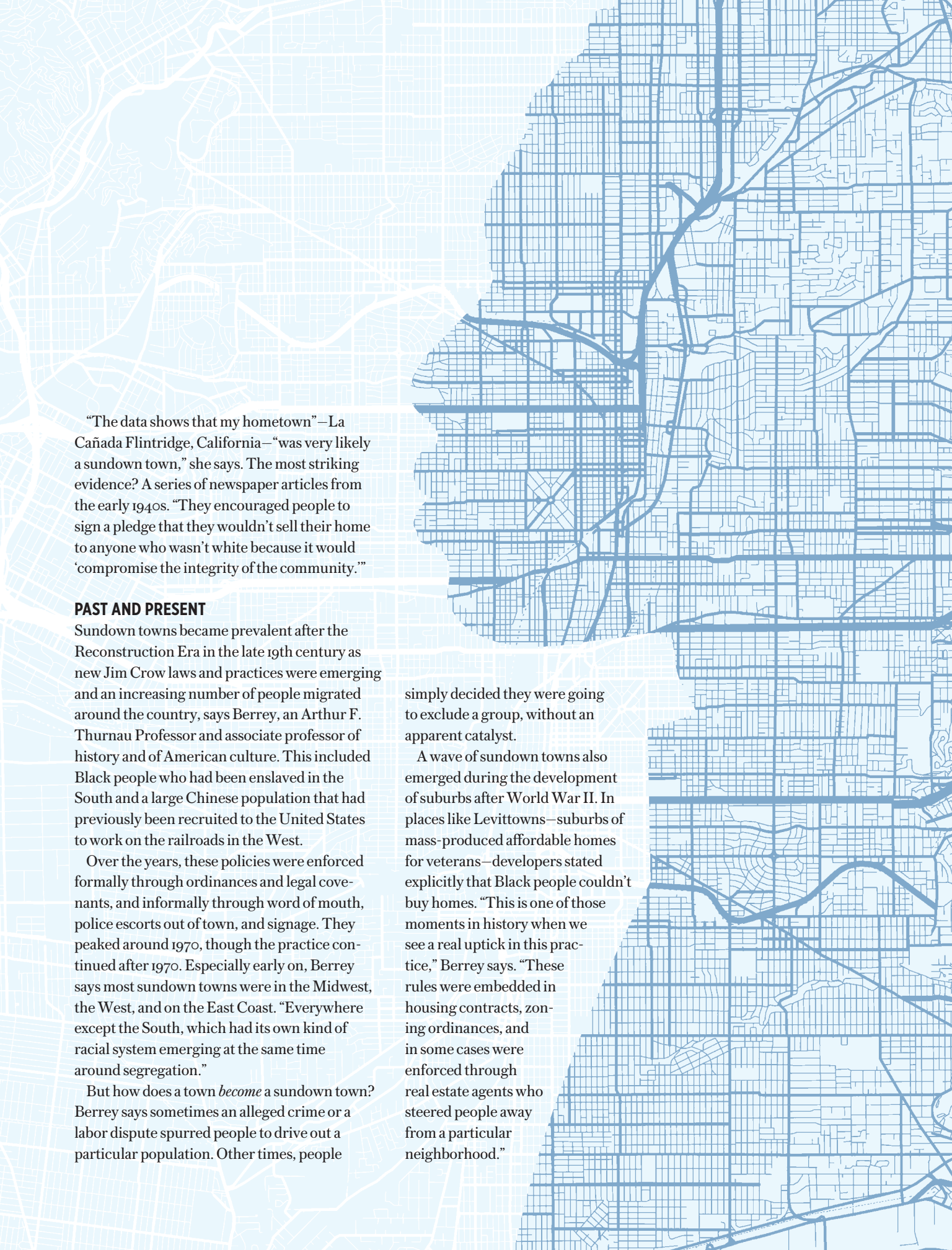
AUDREY MELILLO GREW UP hearing rumors about her hometown. Raised in a suburb just north of downtown Los Angeles, Melillo sensed that she grew up in a sundown town. That moniker refers to the dangers to marginalized groups of being in a town after dark, but more broadly means a town that intentionally excluded a group of people from residing, owning property, or running businesses—historically or even in the present day.

Most often, Black people, Chinese Americans, Mexican Americans, Native Americans, and Jewish people have been affected. For Melillo, a junior in the Gerald R. Ford School of Public Policy with an LSA minor in computer science, this hunch remained unverified until she joined Stephen Berrey's History Lab, which was investigating sundown towns.

"In the class, we chose a town to investigate. We looked at census data and archival information, like old newspaper articles, and conducted oral interviews with the local historical society," Melillo explains.

What did Melillo discover?

Illustrations by Aimee Andrion



"The data shows that my hometown"—La Cañada Flintridge, California—"was very likely a sundown town," she says. The most striking evidence? A series of newspaper articles from the early 1940s. "They encouraged people to sign a pledge that they wouldn't sell their home to anyone who wasn't white because it would 'compromise the integrity of the community.'"

PAST AND PRESENT

Sundown towns became prevalent after the Reconstruction Era in the late 19th century as new Jim Crow laws and practices were emerging and an increasing number of people migrated around the country, says Berrey, an Arthur F. Thurnau Professor and associate professor of history and of American culture. This included Black people who had been enslaved in the South and a large Chinese population that had previously been recruited to the United States to work on the railroads in the West.

Over the years, these policies were enforced formally through ordinances and legal covenants, and informally through word of mouth, police escorts out of town, and signage. They peaked around 1970, though the practice continued after 1970. Especially early on, Berrey says most sundown towns were in the Midwest, the West, and on the East Coast. "Everywhere except the South, which had its own kind of racial system emerging at the same time around segregation."

But how does a town *become* a sundown town? Berrey says sometimes an alleged crime or a labor dispute spurred people to drive out a particular population. Other times, people simply decided they were going to exclude a group, without an apparent catalyst.

A wave of sundown towns also emerged during the development of suburbs after World War II. In places like Levittowns—suburbs of mass-produced affordable homes for veterans—developers stated explicitly that Black people couldn't buy homes. "This is one of those moments in history when we see a real uptick in this practice," Berrey says. "These rules were embedded in housing contracts, zoning ordinances, and in some cases were enforced through real estate agents who steered people away from a particular neighborhood."

"We want to tell the truth about the past and provide a space to grapple with these hard histories. It's the key first step towards thinking about how to create welcoming, inclusive communities in the present."—PROF. STEPHEN BERREY

Today, it is some 150 years after the rise of sundown town policies, and decades after the boom of racially exclusive suburbs. Yet the legacy of these practices still impacts many towns, even in subtle ways, Berrey says.

"It's like a second generation," Berrey says. "Formal ordinances and legal covenants might be gone, but these places are more likely to have issues with police, more misunderstandings across racial lines, or just a lack of interracial empathy. The pattern is clear, especially in places that aren't comfortable talking about and repairing that history. That's where we see the legacy of some of these practices bleeding into future generations."

THE SUNDOWN TOWN PROJECT

Berrey directs the Sundown Town Project, an ongoing research effort that investigates the complicated history of sundown towns and captures that data on a website for the public. Founded by the late historian James Loewen, the Sundown Town Project, like Berrey's History Lab course, uses census data and archival documents to uncover these towns' pasts. "James's research began in Illinois, where he grew up, and he quickly learned these practices weren't just isolated to that state," Berrey says. "He wrote a book on sundown towns and wanted to share that information on a website and allow other people to contribute their own information to it."

The project's research involves a three-step investigation, beginning with census data. A big change in a certain population's presence, either all at once or over the span of decades, could indicate that some marginalizing policy or practice occurred. Researchers cross-reference these dates with archival documents, like newspapers, to check for any major events. From there, they reach out to local members of the town to conduct oral histories. "We rely heavily on this because there often isn't a lot of written evidence of these informal practices," Berrey says.

"We want to tell the truth about the past," Berrey continues, "and provide a space to grapple with these hard histories. It's the key first step towards thinking about how to create welcoming, inclusive communities in the present."

For Melillo, being able to delve deeper into the history of her hometown has added a new dimension to her U-M education. "I'm interested in policy, and this class helped to hone my skills as a researcher and showed me a new side of how problematic codified policies really are," she says.

"Before this class, I thought research was just for the STEM community," Melillo continues. "But I've learned that, through research, we can reckon with the past and truly understand the legacy of these towns. This work is vital. It shows that history isn't rigid." ■

Turn Dreams Into Reality

A scholarship made Alison's dream of attending Michigan a reality. Now, as an LSA sociology major, she is **turning her passion for serving others into action for a better community.**

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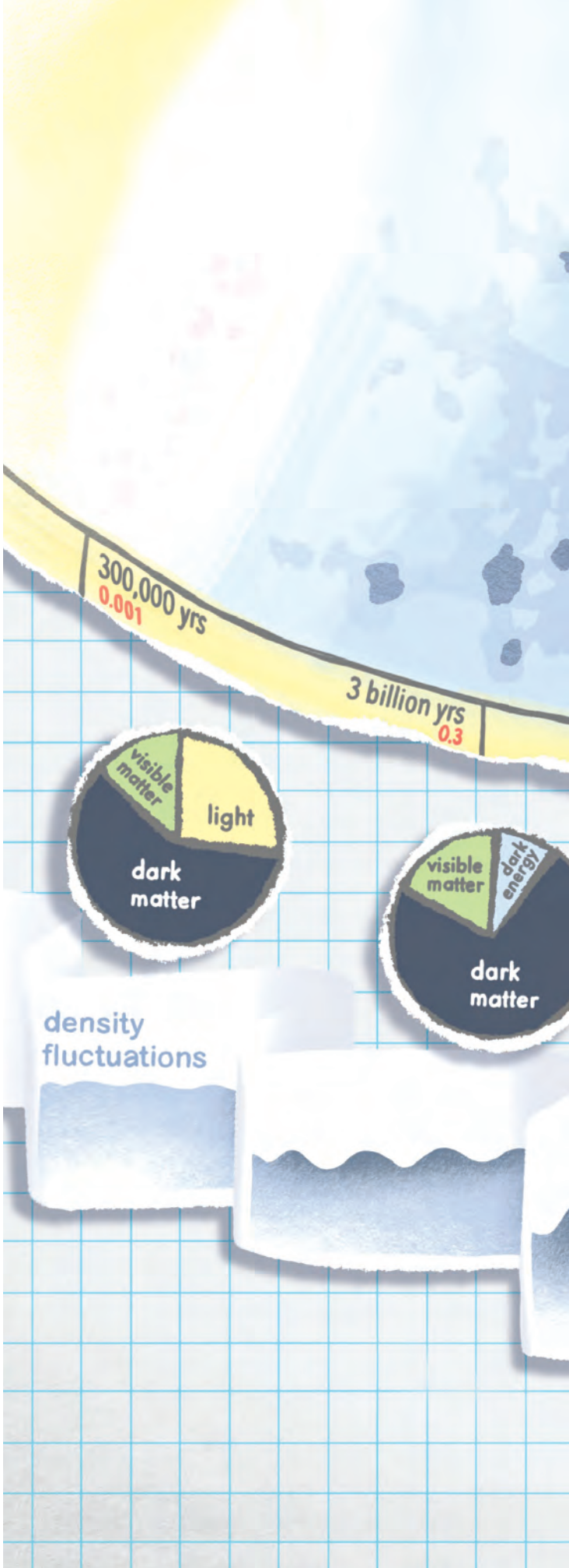
SUPPORTING EXCELLENCE

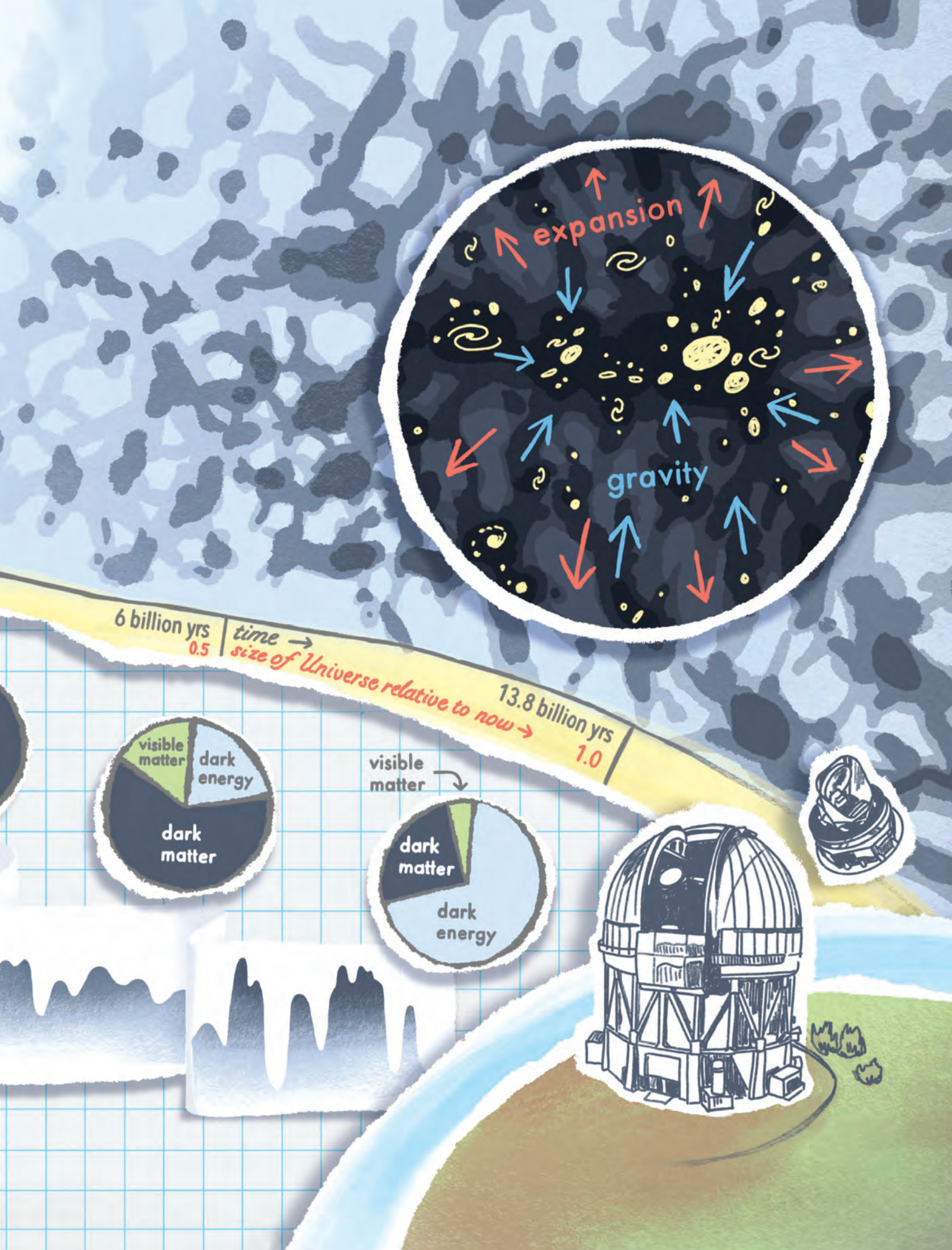
RESEARCH BY JORDYN IMHOFF

Shedding Light on Dark Matter and Dark Energy

A team of LSA researchers found that the standard model of cosmology may be coming under pressure based on new data about the growth rate of large cosmic structures.



Jessie Muir (Ph.D. '18) created this illustration for *LSA Magazine*, showing how dark matter and dark energy influence the Universe along with a timeline of how cosmologists' understanding of each has changed. The Blanco telescope, which is used for the Dark Energy Survey, and the Planck satellite, which measures the cosmic microwave background, are shown on the right side of the illustration.


expansion
gravity
6 billion yrs
0.5
time →
size of Universe relative to now →
13.8 billion yrs
1.0
visible matter
dark energy
dark matter
visible matter
dark matter
dark energy

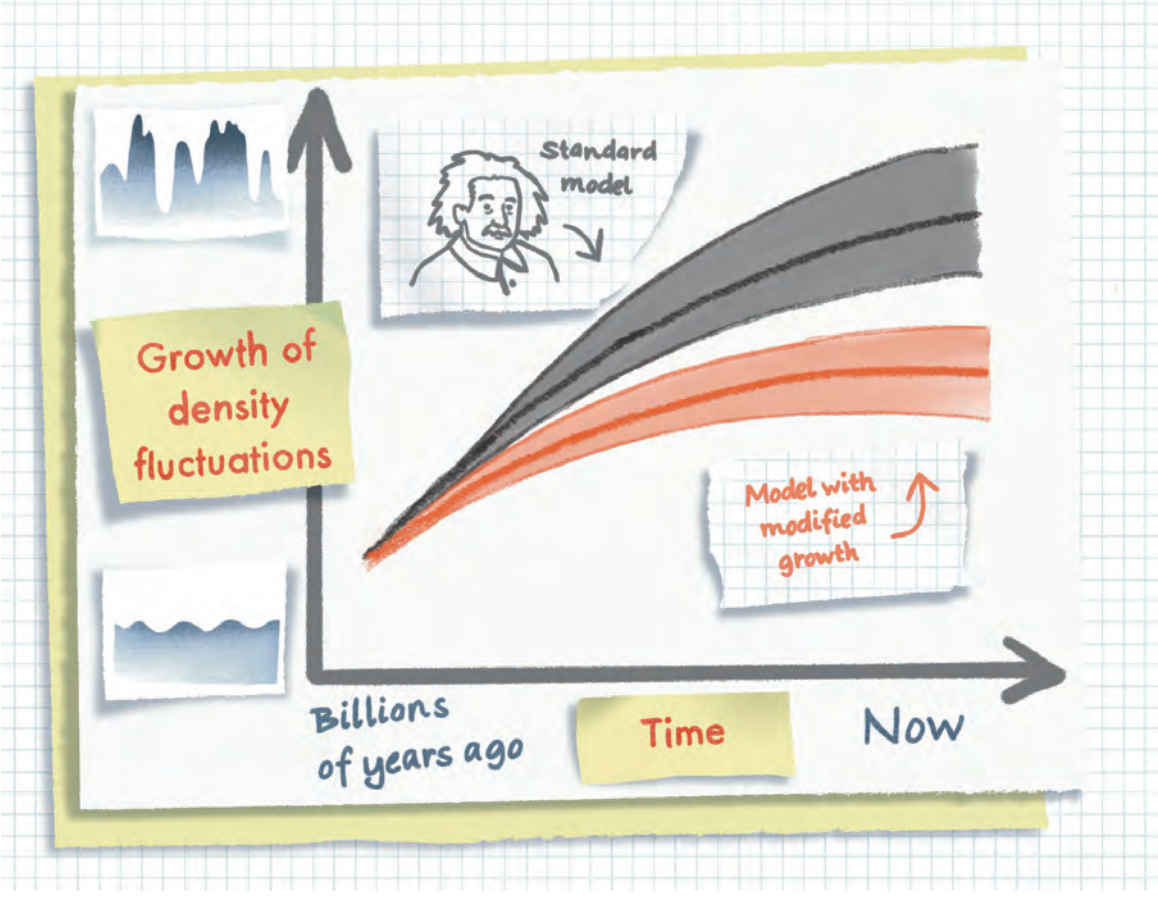
IF YOU'VE EVER had to calculate the energy of an object at rest, you can thank one of the most revered physicists of all time, Albert Einstein. His theory of special relativity proposed that mass is equivalent to energy. That famous $E=mc^2$ mathematical equation (or infamous, depending on how you felt about your high school science classes), was born from this theory, with E representing energy, m representing mass, and c representing the speed of light—a constant.

The theory inspired Einstein's theory of general relativity, which was published 10 years later and outlines our current understanding of gravity. General relativity explains how the gravity of massive structures in the Universe distorts the fabric of space, leading to the bending of light that passes near those structures. Gravity also affects how cosmic structures clump together, like how galaxies become galaxy clusters. Dark matter holds galaxies and galaxy clusters together with gravity, while dark energy repels and counteracts gravity, causing the Universe to expand at an accelerating rate.

Together, all these structures are part of one big, cosmic web that scientists like LSA's Dragan Huterer and Nhat Minh Nguyen, a Leinweber Postdoctoral Research Fellow, study. And according to their research, led by Nguyen, it may be time to reevaluate our long-held cosmological beliefs.

"Cosmology, the study of our 13.8-billion-year-old Universe, has been a highly quantitative science since the 1990s," says Huterer, a physics professor and member of the Leinweber Center for Theoretical Physics. "In many cases, scientists are arguing the second or third decimal point."

Einstein's theory of general relativity has been a theoretical foundation for the current standard cosmological model: the Lambda-CDM model. Although not much is known about dark



Jessie Muir's illustration shows the difference between the standard, Lambda-CDM model and the LSA team's findings. Researchers Nhat Minh Nguyen and Dragan Huterer discovered that the Universe's growth is much more suppressed than previously believed.

matter and dark energy, cosmologists know they take up most of the Universe's mass and energy.

Johannes Ulf Lange and Uendert dos Santos Andrade, two other Leinweber Postdoctoral Research Fellows working in cosmology, are currently exploring scientific theories related to dark matter and dark energy.

"Although these properties dominate the mass-energy content of the Universe and their basic effects on cosmology are reasonably well understood, their physical origin is still unknown. The physical nature of dark matter and dark energy remain two of the most perplexing conundrums in physics," Huterer says.

Remember the Lambda-CDM model mentioned previously, created with Einstein's theory of general relativity in mind? Nguyen and Huterer's research findings, published in *Physical Review Letters*, suggest that that theory may not be in agreement with current measurements in cosmology. The data suggests that dark energy slows down the growth of the cosmic web more than the amount the Lambda-CDM model predicts, and the growth suppression becomes even more prominent as the Universe's expansion accelerates.

"Modern cosmology relies heavily on two main fundamental hypotheses: Einstein's theory of general relativity as the correct theory of gravity on cosmological scales, and the cosmological principle, which is the hypothesis that the Universe is homogeneous and isotropic at a sufficiently large scale," Andrade explains.

"Within this framework, along with observable evidence accumulated over the last two decades, cosmologists can build a model that better fits current observational datasets."

A COSMOLOGY RENAISSANCE

Relax; we're not saying Einstein was completely wrong.

"The deviation of growth from the standard model could be due to new interactions between dark matter and dark energy. ... None of these interactions were considered by the standard model. Dark matter and dark energy were also not the main concerns of Einstein's [theory of] general relativity, so their new properties won't prove Einstein wrong," Nguyen explains.

"Being a scientist means we're always looking for surprises and trying to pose better questions so the field advances," Huterer adds. He and Nguyen seek to make discoveries that may inspire a direction of new physics, and to one day understand the physical nature of mass and energy in the Universe.

> "The physical nature of dark matter and dark energy remain two of the most perplexing conundrums in physics."—PHYSICS PROF. DRAGAN HUTERER

According to Huterer, it's not atypical to see small deviations in cosmological data, with statistical significance of 2-sigma, or two standard deviations from the data's mean, being commonplace. However, Nguyen and Huterer's research produced a highly significant result of 4-sigma. For context, statistical evidence of 5-sigma is considered solid evidence for a new phenomenon, so seeing 4-sigma evidence is pretty exciting.

"We're entering an era with extremely large data sets—maps of millions of galaxies—becoming available," says Lange, an astronomer who researches dark energy across time periods of the Universe and conducts public outreach to make his work accessible to the average person. "This is a fast-moving field, and that's what makes working on cosmology so exciting."

Huterer concurs. "I hope to live long enough to see the nature of dark energy explained. I'm hopeful because it seems like we're coming into a golden age of cosmology." ■

House Party: Moviestore Collection Ltd./Alamy
Jay-Z: Brigette Sullivan/Alamy

FACULTY BY GINA BALIBRERA

When Did You Fall in Love with Hip Hop?

Professor Stephen Ward is leading an LSA celebration of the 50th anniversary of hip hop that's as vibrant and multitudinous as the art form itself: in the classroom, online, in Detroit, on a mixtape, and in an art gallery.

ONCE UPON A TIME—in the Bronx, August 11, 1973, to be precise—Cindy Campbell and her big brother threw a house party. Cindy was a teenager and needed back-to-school clothes. By charging a couple of bucks for entry to the party, Cindy knew she could make enough cash to start the school year in style. Her brother, a few years older, obliged her by serving as DJ. He went by Kool Herc, and that night, as the tale goes, he changed the world.

Whether it was spontaneous or an act of divine inspiration, no one is certain. What we do know is this: At the party that night, Kool Herc unveiled a technique he called "the merry-go-round," and when Kool Herc's new sound hit the floor, the world around him changed.

What was Kool Herc playing at the Back to School Jam? Likely James Brown. "It wasn't a Kool Herc party without James Brown," says one regular at the siblings' parties, in a video in LSA Professor Stephen Ward's online archive of hip hop history. "Clap your hands, stomp your feet," the witness to the dawn of hip hop says in the video, smiling.

OK, back to the party. So Kool Herc put two turntables beside each other, and he played the break on one turntable, then played it again on the other turntable, using a mixer and his hands to loop the most danceable part of the song, seemingly stopping time, and sending those teenagers into ecstatic movement. *Clap your hands, stomp your feet. Clap your hands, stomp your feet.* Hip hop was born. Or so the story goes.

"My view is that the 50th anniversary of hip hop is a happy fiction," Ward says, with a puckish grin. Ward—Arthur F. Thurnau Professor and an associate professor of Afroamerican and African studies—explains that the birth of hip hop probably didn't happen at that party, or on that very day. It's likely, innovative as DJ Kool Herc was, that many hip hop artists were emerging at that time, influencing and inspiring each other.

"I'm not saying it's so much a fiction as it is an amplification of revision. It's accurate to say hip hop began at this period, but I think it's just that this party flier happened to survive."

A copy of the flier invitation to Cindy Campbell's Back to School Jam, faded now, is part of

Illustrations by DaJaniere Rice

Ward's syllabus for his hip hop course. Though hip hop likely didn't spring fully formed from Kool Herc's merry-go-rounding hands that night, à la Athena born of Zeus's forehead, the gesture toward the apocryphal tale conjures some of the magic of hip hop, and the reverence Ward has for it. The relic is part of the story of hip hop that's bigger than one night.

DO YOU STILL LOVE H.E.R.?

In the LSA Course Guide, Ward's class is called "The History and Evolution of Hip Hop." But everyone (this class fills up fast, and boasts 200 students and four graduate student instructors each term) refers to the class by its guiding question: *When did you fall in love with hip hop?*

In pursuit of that question, Ward guides students through the history, cultural moments, and political and social movements of the last 50 years—all of which affected and became the subject matter for hip hop artists. The question itself comes from a film Ward teaches as part of the class, 2002's Brown Sugar, a hip hop classic that—like the story of hip hop itself—is a love story.

"That is the question we are going to ask, not just of ourselves, but of the country, and of the world: When did they fall in love with hip hop, and when did it become the global sensation that it is today?" Ward says.

In addition to the class, Ward offers a course through the Semester in Detroit program called "DestiNations of Hip Hop: 50 Years of Hip Hop Through a Detroit Lens," which was taught most recently by Detroit artists and cultural workers Khary Frazier and Sterling Toles.

Ward is also co-leading a yearlong interdepartmental project called "The Mix-Tape: Hip Hop at 50" with American culture professor Su'Ad Abdul Khabeer. He also worked on an exhibit that showcased art and artifacts that celebrate the history and culture of hip hop over the last half-century.

In his instruction, Ward guides his students through the timelines of hip hop history: how and when it began, and how it moved throughout the country, exploring a range of artists, subgenres, and controversies, from Tupac and Biggie's notorious coastal beef, to female emcees and misogyny in hip hop.

It would be difficult to choose just one song to soundtrack his exploration of hip hop history, but Ward returns to the 1994 Common song, "I Used to Love H.E.R." It's about an evolving movement, Ward explains, with "her" being hip hop itself. ■

Authenticity in the Age of AI

Professor Stephen Ward is collaborating with a student, Holden Hughes, on a website to commemorate the 50th anniversary of hip hop and to complement his course.

Holden Hughes, a second-year undergraduate student in the Program in the Environment, took Professor Stephen Ward's course during his first year and enjoyed it so much that he returned to volunteer his web building skills. The site Hughes is creating includes archival interviews (like the one featuring the Kool Herc party attendee) and breaks down the four elements of hip hop: DJing, MCing, breakdancing, and graffiti-writing, and will eventually contain material on hip hop artists like DJ Kool Herc, Afrika Bambaataa, and Grandmaster Flash.

Hughes also names artists such as A Tribe Called Quest, Nas, Dr. Dre, Lil' Kim, Detroit rapper Boldy James, UK rapper Little Simz, and JID as personal favorites he hopes to showcase on the website. All of these artists are consistent, enthusiastic about the craft, approach lyrical storytelling with interesting beats, and revere the roots of hip hop, Hughes says.

And none of them "feel like clones of another," Hughes says. "Authenticity is a main tenet of hip hop."

This tenet is noteworthy especially because we live in a time in which artists are not always encouraged to be authentic, Hughes says, citing one of countless "bad robot situations": Artificial Intelligence rapper gets signed to a label; AI rapper starts perpetuating racist stereotypes; the digital plug is pulled after a week of nonsense. This story is the inverse of DJ Kool Herc's merry-go-round of innovation and joy in the Bronx, "happy fiction" or not.

But Hughes is hopeful about the future of hip hop, despite algorithm echo chambers, the shuttering of music journals like *Pitchfork*, and those bad AI robots. And he believes it's an interesting time to be a music fan. Genre fusions that incorporate R&B, house music, and neo-soul happen with ease online, he says. Hip hop fans and artists share what they love to wide audiences on social media, inviting listeners to clap their hands, stomp their feet, and come dance at the party.—*GB*

Grandmaster, Melle Mel and the Furious Five CD: Granamour Weems Collection/Alamy

Rapsody: Tony Nelson/ Mediapunch Inc./Alamy

Ancient Wisdom, New Technology

AI is giving new life to scrolls buried in Mount Vesuvius's wreckage, and classical studies Professor Richard Janko is on the team deciphering texts unearthed from volcanic ash.

A Herculaneum scroll is scanned. LSA Classical Studies Prof. Richard Janko is helping translate the ancient scrolls.

EduceLab/Courtesy of the Vesuvius Challenge

WHEN MOUNT VESUVIUS ERUPTED in 79 CE, a plume of scalding ash smothered the western coast of Italy. Waves of gas and volcanic rubble blasted across the landscape, engulfing cities in a suffocating heat. To the north of Pompeii, the city of Herculaneum was buried under more than 60 feet of debris.

Richard Janko, the Gerald F. Else Distinguished University Professor in LSA's Department of Classical Studies, is fascinated by what lies within the ruins of Herculaneum.

During Janko's tenure at U-M, he has introduced thousands of students to "deep time": the philosophies of past civilizations, how they continue to shape current events, and how lessons of the past can help us avoid future catastrophes. "I engage students in some rather big questions," says Janko. "The humanities should inspire us to imagine how different things could be."

Janko believes that a library of ancient papyrus scrolls containing philosophical and scientific texts lost to the ages lies under the Herculaneum debris. Some of that buried wisdom is now coming to light, thanks to artificial intelligence and a competition that uses machine learning to decipher scrolls pulled from the wreckage.

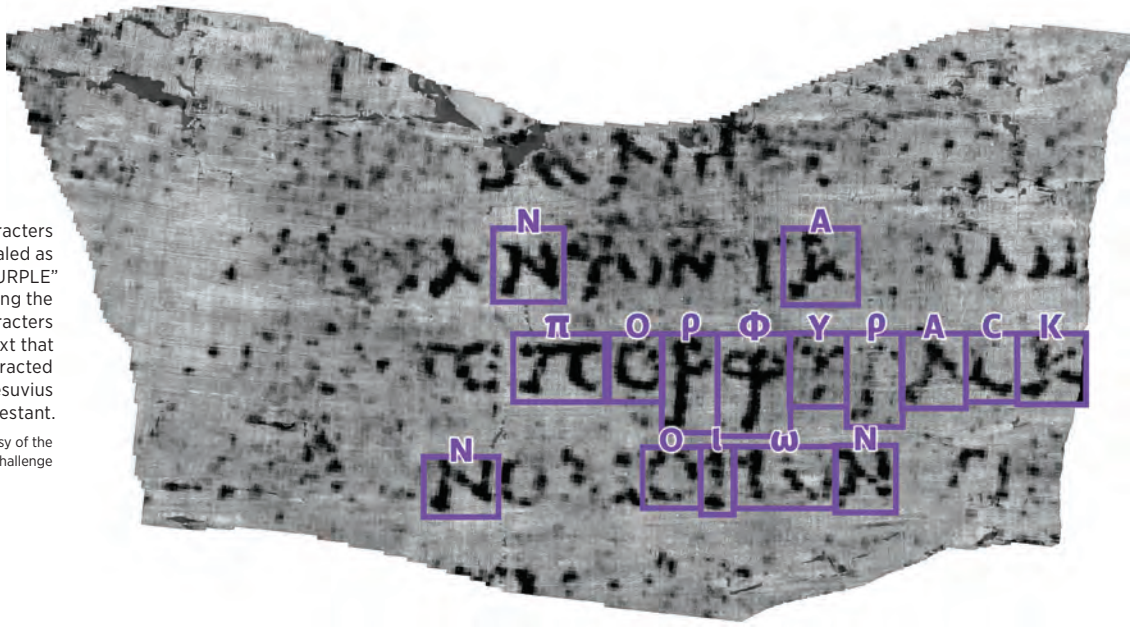
VILLA OF THE PAPYRI

Political and religious upheavals, along with neglect and decay, have led to the destruction of most texts from the ancient Mediterranean civilizations, though some of the best-regarded ones were duplicated and survived—and many can be viewed at the U-M Hatcher Library, which houses the largest collection of ancient manuscripts in the Western hemisphere.

An abundance of papyrus scrolls that were unearthed in the 1700s could further expand our knowledge of the ancient world. The discovery of scrolls occurred at a villa in the ruined city of Herculaneum that was owned by Julius Caesar's father-in-law, and the scrolls are thought to include the writings of Epicurean philosopher Philodemus. Until recently, though, many scrolls were completely unreadable.

Papyrus biodegrades with exposure to the elements, but the 800 scrolls buried under volcanic debris from Vesuvius were preserved in a blackened, carbonized form. While attempts to unwrap the charred scrolls have met with modest success over the centuries, many remain intact. They intrigue Janko, who has spent four decades painstakingly translating the script on the opened, heavily damaged, Herculaneum scrolls.

"One of the most upsetting things happened to a Herculaneum papyrus that was gifted to Napoleon," says Janko. "Unfortunately, an attempt was made to take it apart in 1986, and it broke into 300 pieces. It's going to be terribly hard ever to put them back together again."



The Greek characters that were revealed as the word "PURPLE" are among the multiple characters and lines of text that have been extracted by a Vesuvius Challenge contestant.

Courtesy of the Vesuvius Challenge

THE VESUVIUS CHALLENGE

If unrolling the Herculaneum scrolls is almost guaranteed to destroy them, how can they be deciphered? Fortunately, Janko's friendship with University of Kentucky engineering Professor Brent Seales has led to some new opportunities. Using micro computed tomography—a type of 3D X-ray technique—Seales can flatten layers of rolled scrolls into 2D images for translation. With Janko's help, Seales tested an early version of his technology on fragments of a Hebrew text in the U-M library collection.

"Richard was an early adopter of our technique, and he volunteered to introduce us to U-M library staff when we struggled to find material to work on," says Seales. "He was really responsible for helping us find a way to test our methods."

The intact Herculaneum scrolls have presented a challenge to virtual unwrapping because ancient writers used carbon-based inks on the papyri instead of denser, metal-based inks. The scrolls, which were practically unreadable with only tomography, were shown by the Seales research team to contain ink evidence that could be enhanced by machine learning. Their published work confirming that fact was the basis for the Vesuvius Challenge, which invited contestants to improve the quality of the machine learning and therefore the readability of the results.

The challenge—co-founded by Seales in 2023—crowd-sourced training of an AI machine learning model to recognize ink from the Herculaneum scrolls. Seales's team used a particle accelerator to create high-resolution scans of a few papyri and released scanned data to the public to improve the decipherment process, including segmenting the scrolls into distinct layers and finding the ink.

Janko and a team of papyrologists judged 18 entrants' submissions, with a top prize of $700,000 going to a team of three students earlier this year. The teams competing in the Vesuvius Challenge refined machine learning algorithms on already-unwrapped sections of the scrolls, which were scanned by the Seales research team in 2019 at the Diamond Light Source outside of Oxford, England.

Janko hopes that Seales's virtual unwrapping techniques will lead to further excavation at the Herculaneum villa.

"The scrolls that we found were just the contents of someone's study," says Janko. "This was the villa of a great Roman family, the Pisones. They must have had a proper library that would have contained great works of antiquity we've yet to uncover." Janko believes that new technology to decipher carbonized scrolls will illuminate various ways that communities have organized themselves in the past, and provide fodder for imagining more fulfilling political structures for the future. ■

ENDLESS *Opportunities*

Alison Lia Roberson is graduating this spring with a degree in communication and media studies, and entrepreneurship—as well as a job waiting for her at Google.

Her experience at LSA paved the way to prestigious internships, including one in Barcelona; course-related volunteer work in which she wrote letters to inmates to provide them with helpful resources; and knowledge about everything from oceanography and film editing to Latinas in the U.S. and Black women in pop culture. And the critical-thinking tools she learned at LSA helped her ace her job interviews.

"At LSA," she says, "the opportunities are endless."

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Prime Time for the Liberal Arts

LSA is the launchpad for great ideas, careers, and innovations at a time when the liberal arts are more important than ever.

IN THE END, the excellence of this remarkable college we call LSA comes down to the people. I learned this from my grandfather, who was a long-time university administrator, and I have returned to this mantra again and again over the past five years as the dean. Yes, it matters that we have top-flight buildings, technology, and the like—and we invest in this infrastructure to support *people*. Key to the entire LSA enterprise is that we recruit and retain outstanding students, faculty, and staff, and we ensure that they can thrive here.

This notion of thriving represents a relatively new development and an important one. What do students need to succeed in meaningful ways in relation to their goals? It can take the form of help writing their first college paper, or getting support when life events challenge their mental or physical well-being, or finding a prestigious internship, or locating a point person to guide them as they navigate LSA's many resources. We have learned a lot about what we need to build to have resources that are readily available to LSA students, especially those who have been historically underrepresented in higher education.

And when LSA faculty and scholars seek answers that will help us better understand our universe, our state, our history, and ourselves, we have resources for them. We have expanded our support for our research enterprise and for inclusive, equitable, effective teaching and mentoring. This is what LSA does: We support the people who study and work here. Indeed, such support is a fundamental part of who we are as a college.

This ethos of people-first support is in some ways a logical outgrowth of the core scholarship of LSA. After all, the liberal arts have always provided a foundation for a meaningful life and successful career, and for expanding our understanding of the human condition and the natural world.

Here in LSA, we've been thinking about what our community needs and adopting innovative approaches to research, learning, and wrap-around support. A few highlights: We're building the new cross-college Quantum Research Institute. We launched the LSA Meet the Moment Research Initiative, which supports LSA teams addressing pressing issues including mass incarceration and climate change. In response to students' desire for digital and computing literacy in a liberal arts context, we created the new Program in Computing in Arts and Sciences (PCAS), and the class enrollments are expanding exponentially. PCAS lives alongside the groundbreaking Digital Studies Institute, where humanists and social scientists come together to pursue essential work on technology, digital culture, and social justice.

In terms of wrap-around support at LSA, we are building upon what we have learned about some traditional models of education, in which students are thrown into the ocean to either sink or swim: It does not serve them, us, or society. Giving a student a tuition scholarship isn't enough for them to thrive; students need more support for academic success and for well-being in order to fully succeed in the classroom and in the world they will enter when they leave here. We're launching the new LSA First Gen Commitment, which expands to more students the kind of wrap-around support we provide in the Kessler Scholars Program and the U.P. Scholars Program, which are already national models. Our foundational introductory courses are being transformed to be more inclusive and equitable—and rewarding for instructors and students alike.

Austin Thomason/Michigan Photography

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We have added new ways of connecting students with valuable internship and employment experiences, as well as LSA alums who are excited to be mentors, at the LSA Opportunity Hub. To foster the sense of community and well-being that is critical to student success, we have established a number of programs, such as LSA@Play, for students. This programming and event series helps to build the LSA identity among undergraduates—and events such as the welcome picnic and movie night and a book giveaway ("a blind date with a book") are so much fun! LSA has also recently launched Intend to Attend (I2A), an online college prep platform that provides eighth-12th grade students the necessary resources and information to pursue a postsecondary education.

In all of this, I am especially heartened by the structural support we have given to diversity, equity, and inclusion and mental health and well-being efforts. These include convening and implementing recommendations from task forces on anti-racism, the prevention of sexual harassment, and support for the LGBTQ+ community; building out the Collegiate Fellows program; and the creation of two Disability Navigator roles and two Student Mental Health and Well-Being Advocates.

All of this investment is setting up LSA students and graduates for even greater success—which is vital, especially during a time when we are all hearing the narrative that the liberal arts are not valuable. You know that is not true, and I know that is not true. Indeed, LSA is tackling the world's most daunting problems, and creating foundational knowledge–which we will rely on in the years to come as new challenges arise. We focus on the human and the humane; we probe what we think we know about how the world and universe work; we ask the hard questions and hone our skills at creative collaboration in diverse teams to find solutions.

At the end of June, my five years as dean will end. Serving as dean has been one of the greatest honors of my career, and I have found this leadership role meaningful and rewarding beyond what words can capture here. I am also excited about my next chapter, as I dive more fully into public intellectual work as a linguist and return to teaching more regularly. Both of these pursuits also bring me deep joy and purpose.

I have worked with intentionality and purpose to live up to my initial promise from five years ago by keeping people at the center of every decision I have made. In my next chapter, I will continue to advocate fiercely for LSA, liberal arts education, and the people who make it all possible. LSA is my alma mater and has been my faculty home for the past 22 years, and I am grateful to have served as its leader during this remarkable time in our history. ■

UNITY AND JOY
Participants in the MLK Day Circle of Unity trace their hands onto a cloth circle and write their response to the question, “What brings you joy?” The collective art project “captures our community at the moment in time,” says Christine Modey, director of the Michigan Community Scholars Program, the lead sponsor of the event. The activity began last year, when program coordinator Christina Mozumdar and her student leader team first created a similar collective art project. The Circle of Unity was part of the university’s robust offerings of activities on Martin Luther King Jr. Day.
Shannon Schultz/Michigan Photography


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