UNIVERSITY OF WISCONSIN–MADISON COLLEGE OF LETTERS & SCIENCE

FALL 2025

# Letters&Science

## INTO THE FLOOD ZONE

page 16

Society is quickly approaching a copper shortage, but geoscience alumna Liz Dennett has big ideas for sustainable solutions.

PHOTO: LEA GOLIS

# Contents

DEPARTMENTS



FEATURES





UW–Madison's fusion energy researchers achieved first plasma on July 16, 2024.

COURTESY OF UW–MADISON AND REALTA FUSION INC.

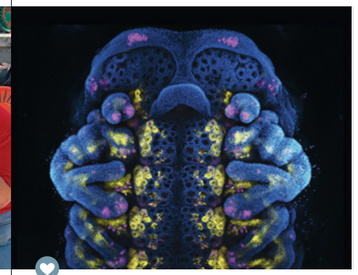
**"The road to discovery is long and, while sometimes indirect and unpredictable, leads not just to a better understanding of ourselves and the world around us, but to ultimately improving lives and driving economic development."**

ERIC M. WILCOTS
Dean of the College of Letters & Science and Mary C. Jacoby Professor of Astronomy

# #WeAreLS

We kicked off the new academic year on the Terrace with @uwbadgerband, inspiring words from @uwdeanwilcots and a group photo to mark the moment. Welcome to the College of Letters & Science, Badgers!

@UWMadisonLS September 2, 2025



We always love it when the winners of the annual Cool Science Image Contest are announced. We love it even more when those winners include folks from our botany, integrative biology and geoscience departments. Congratulations to all!

@UWMadisonLS October 2, 2025

The 2025 edition of our Letters & Science Summer of Excellence in Research (LASER) wrapped up with a lively poster session in the Chemistry Tower.

@UWMadisonLS August 11, 2025

Each week, the Chicanx/e & Latinx/e Studies Program hosts community gatherings. The idea is to build community through good food and even better conversations.

@UWMadisonLS May 19, 2025

PHOTOS: SHANHONG YU (TERRACE), PAULIUS MUSTEIKIS (LASER), PRASHANT P. SHARMA (COOL SCIENCE IMAGE CONTEST),MARLITA BEVENUE (COMMUNITY GATHERINGS)



**Letters&Science**
FALL 2025

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FROM THE DEAN

# Turning the Tide

**As we planned for the Fall 2025 issue,** I wanted to highlight a topic that showcased how L&S faculty, staff and students are working on some of the most important challenges facing society today. When I pitched flooding as a story idea to the magazine team, it was before the Texas disaster that caused 135 casualties. It was before the Appalachian floods in Kentucky that forced entire towns to evacuate. It was before the storms in southeastern Wisconsin this summer that caused so much damage that even the State Fair had to shut down. These headlines are heart-wrenching, but researchers in the College of Letters & Science are already pursuing critical work that can address these crises in the future. We have some of the top experts in this field working to come up with solutions that support people, places and property.

At the core of our cover story, "Flood Zone," on page 16 are researchers who are taking the time to listen to the communities affected by these disasters. Take Andrea Dutton, the Helen Jupnik Endowed Research Professor of Geoscience, for example. She's leading a team to conduct surveys on affected communities to identify what resources they need to rebuild and prevent future damage. Max Besbris, the H.I. Romnes Associate Professor of Sociology, is taking a grassroots approach to finding out why people choose to stay in communities that are at high risk for flooding. And Ed Boswell (PhD'18), a teaching faculty member in the Department of Planning and Landscape Architecture, is getting students involved by helping them connect communities with geographic information system (GIS) tools that can assess the effectiveness of flood prevention plans. It's this kind of people-focused, collaborative and cross-disciplinary research that is going to create change.

We are in a time when it is essential to stress the importance and impact of research — because it is exactly this type of work that is at risk due to federal spending cuts. That's why we took a trip down memory lane in "The Road to Discovery" on page 22, a story that celebrates some of the most remarkable research breakthroughs that have happened in the history of L&S. From weather satellites to the Healthy Minds app, the College has been tackling some of the biggest questions facing our society since its founding in 1889. I also encourage you to turn to the final story in this magazine, "With Bated Breath," on page 36, an essay from botany alumna Stacey D. Smith (PhD'06). When her son had a severe strep infection that threatened his ability to breathe, she met with doctors who knew exactly how to help him. And as a researcher herself, all she could think about was her gratitude for all of the minds who developed the tools, techniques and medication that were needed during her family's emergency.

Beyond research, this magazine also celebrates our amazing alumni. Turn to "Wisconsin for Life" on page 26 to read about Badgers who stuck around after graduation to create positive change in their communities or to "A Penny for Her Thoughts" on page 32 to learn how geoscience grad Liz Dennett (MS'10, PhD'14) is using her problem-solving skills to tackle the copper crisis. Plus, there are stories of students exploring our oceans, professors going above and beyond in the classroom and a grad student who's an expert on the Wicked Witch of the West's journey from minor antagonist to full-fledged hero.

As the dean, every day I have the privilege of seeing our outstanding students, faculty, staff and alumni at work pursuing excellence. The ideas, discoveries and good works coming from our community don't develop in a vacuum. Instead, they arise from conversations, partnerships and support from people like you. I'm incredibly grateful to everyone who supports L&S and our mission. We need that support now more than ever. Thank you for championing the College of Letters & Science.

On, Wisconsin!

**Eric M. Wilcots**
*Dean and Mary C. Jacoby Professor of Astronomy, College of Letters & Science*

Arthur Neumann, the son of a UW alum, looks at a fish during the Hasler Laboratory of Limnology's open house.

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PHOTO: TAYLOR WOLFRAM

## Deep Dive

**What's beneath the surface** of Lake Mendota? At the Hasler Laboratory of Limnology's annual open house, community members explored the aquatic life of Madison's lakes and spoke with researchers. They also met some of the plants and animals living in the waters during a hands-on introduction to the tools freshwater scientists use.

"We understand how deeply the people of Madison and beyond care about our lakes," says Helen Schlimm, a research specialist and outreach coordinator for Hasler Lab. "Our open house has been running for a decade, while UW–Madison scientists have been studying the Madison lakes for over a century."

Some visitors went out on a boat ride to collect water samples from the lake while others marveled at zebra mussels through a microscope or made fish puppets. Plus, there were plenty of real fish to observe and identify.

"We open our doors to everyone and set up hands-on activities and lake tours to engage the community in what we do as freshwater scientists," Schlimm says. "The open house is always a bright spot in our yearly outreach calendar."

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MEDIA MENTION

## "A huge problem in advice research is that people are very persuaded by confidence. … You have a lot of very confident people out there giving advice, and people cannot tell the difference."

**PROFESSOR OF COMMUNICATION SCIENCE LYN VAN SWOL**

sharing her research in a *Vox* article about how to contend with an onslaught of advice online, and the science of what it's doing to our brains

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## Collective Experience

**What is the Black** experience in Madison? That's the question at the heart of the research being tackled by the SoulFolk Collective — a new research lab created by Assistant Professor of African American Studies Jessica Lee Stovall ('07). Working with a team of 11 undergraduate and graduate students from disciplines across campus, Stovall has interviewed Black Madison residents from varied economic and social backgrounds to hear their stories. The project is part oral history, part social experiment, and in the end the group hopes to understand and support this community. "It's really a look at how Black people navigate space, and how they find and design spaces where they feel like they can be their full selves," Stovall says. Read more and watch the video at **go.wisc.edu/lssoulfolk**.

PHOTO: HOPE KELHAM

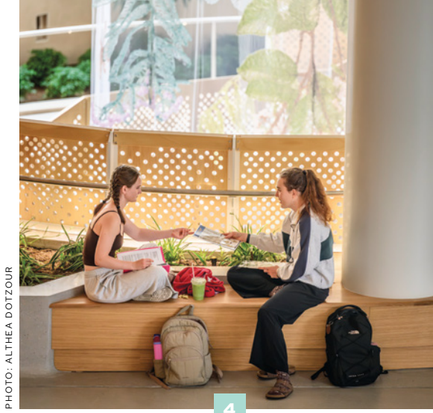

PHOTO: ALTHEA DOTZOUR

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## Doors Open

**This September,** students were welcomed into Morgridge Hall. The state-of-the-art building, named for UW–Madison alumni and longtime philanthropists John ('55) and Tashia ('55) Morgridge, is the new home for the School of Computer, Data & Information Sciences. Students took classes, had study sessions in the plant-filled atrium and grabbed coffee at the new café, Ground Truth. Next year will bring another ribbon cutting for Letters & Science, with Irving & Dorothy Levy Hall scheduled to open during the summer of 2026. Marv ('68, JD'71) and Jeff ('72) Levy are the lead donors for the project, and the building's name honors the memory of their parents. Marv, Jeff and their late brother Phillip ('64) Levy are all proud L&S graduates. This new hub for the humanities will house eight L&S departments.

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# 20,559

That's the number of students who have been a part of the First-Year Interest Groups (FIGs) Program, which creates cohorts of students who share common academic interests and three fall-semester classes together. This year, the beloved program is celebrating its 25th anniversary.

Cynthia Erivo plays Elphaba in the first-ever film adaptation of *Wicked*.

# Why is she green?

Depictions of the Wicked Witch of the West have evolved over the years. The most notable change: She wasn't always green.

BY ALLI WATTERS

**It's not easy being green.** This catchy lyric is as true for Kermit the Frog as it was for Margaret Hamilton, the actor who played the Wicked Witch of the West in the 1939 film *The Wizard of Oz*.

"It was a copper paste that they put on her skin to get that strong green color, and too much copper is toxic to our bodies — it's incredibly dangerous," says Ailea Merriam-Pigg, a graduate student studying communication arts. "*The Wizard of Oz* was not a safe set to be on, and the makeup was a major aspect of that."

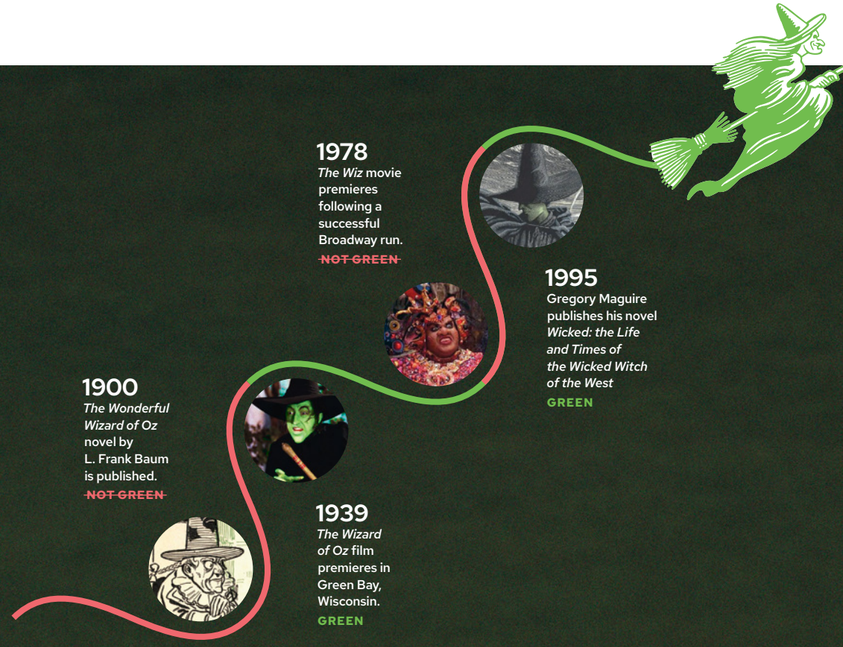
While Merriam-Pigg is currently conducting dissertation research on identity and play in digital spaces, some of her earliest academic work focused on the journey of the Wicked Witch from minor antagonist to full-fledged hero. She even co-authored a chapter on this topic in the book *I Want to Do Bad Things: Modern Interpretations of Evil*. And with the popularity of the 2024 *Wicked* film starring Cynthia Erivo as Elphaba, her expertise is coming in handy. Outlets like National Public Radio have been reaching out to learn more about the film and the literature that inspired it.

The question of why a film studio would decide to paint an actor with copper becomes a lot more puzzling when you understand one thing: They didn't have to. In the original *Wonderful Wizard of Oz* novel by L. Frank Baum, green skin wasn't part of her character design.

"In Baum's work, he never calls her green, he actually doesn't describe her skin at all," says Merriam-Pigg. "She is often described by him as an old lady with kind of a hag appearance. If you look at the illustrations from his first illustrator, that's how he portrayed her along with three braided pigtails on her head."

She wasn't even a main character in the story, but more of a small villain featured in just a couple of scenes. But there was one notable quality that has been lost over time — she was missing one eye.

"She was an ableist portrayal of disability," says Merriam-Pigg. "Baum says that her eye was as good as a telescope and allowed her to keep an eye on the kingdom. This is a depiction of a 'supercrip,' which is when someone's disability gives them superhuman powers. So, the Wicked Witch has always been a representation of a marginalized identity from the start."




Baum's original characterizations from the 1900 book were maintained for decades, even in the Broadway production that premiered three years later.

But nearly everything about the Wicked Witch changed in the 1939 motion picture, which became especially popular because in the age of black-and-white films, it was set in bright technicolor. The writing and production team wanted the colors to stand out, so they made some editorial changes. Chiefly, Dorothy's silver slippers were brought to the big screen in ruby red, and the Wicked Witch of the West had a green look that would launch a new chapter for the character.

Unlike *The Wiz*, which is a separate reimagining of *The Wizard of Oz* for an all-Black cast in 1970s New York City, *Wicked* is meant to be canonical. It's an origin story for the Wicked Witch of the West. She had a family, a dream and a name.

"If we're talking about why the Wicked Witch is green, we get into the technical things of early color film, marketing and creating a cinematic experience," Merriam-Pigg says. "If we're talking about why Elphaba is green, we're talking more about the experience of being marginalized."

In the 1995 book *Wicked: The Life and Times of the Wicked Witch of the West* by Gregory Maguire as well as the Broadway production, Elphaba's greenness isn't just an accessory to the character, it's a core part of her identity. It leads to constant discrimination from strangers, peers and even her own father. But by the end of the story, it is something that she reclaims as part of her personal pride and power.

Merriam-Pigg explains that, over the years, Elphaba's journey has been used as an allegory for the experiences of people in society who have faced discrimination. This is a sentiment that Erivo took seriously when they took on the iconic role and adorned the (this time much safer) green makeup.

"As I stand here in front of you: Black, bald-headed, pierced and queer, I can say I know a thing or two about being the other," Erivo wrote on Instagram about their connection to the character. "Elphaba's story is about how a colorful, powerful, magical woman — despite being disparaged, demonized and discriminated against — becomes a hero."

Like many fans of the latest franchise, Merriam-Pigg is looking forward to Erivo reprising this role in *Wicked: For Good*, which will be released on Nov. 21.

"They connect very strongly to this character," Merriam-Pigg says. "I am excited to see what they and the rest of the cast do in part two." ■

PHOTO: SOPHY HOLLAND FOR UNIVERSAL PICTURES

PHOTO: SHANHONG YU

Stephen Kantrowitz teaches students how to do archival research in the Wisconsin Historical Society.

TEACHING

# Learning the Land

Stephen Kantrowitz awakens his students to the connections between their hometowns and Native American history.

BY AARON R. CONKLIN

**Jack Borok ('25) spent most of his young life in Los Angeles,** unaware that the populous California city was also home to the modern descendants of the Gabrielino, Chumash and Tata tribes that occupied the basin when settlers arrived in the 18th century. He hadn't learned that history until he came to UW–Madison in 2021 and took a class from Stephen Kantrowitz, the Linda and Stanley Sher Professor of History. Borok also learned about the lost village of Encino, a more than 3,000-year-old Gabrielino settlement that archaeologists had discovered … right across the street from the office building where his father worked.

Borok's personal connection — and his research into its history — are at the heart of "Homeland, Hometown: Native and Settler Places," a course Kantrowitz teaches to students in alternating years. The idea for the course sprang from one Kantrowitz formerly taught, "Native Madison After Removal." He describes that class as an attempt to better understand the place he's called home for the last 30 years. But it also raised several broader questions.

**"Native people tend to disappear from the American history curriculum."**

STEPHEN KANTROWITZ

"I had the same insight that millions of non-Native Americans have had," says Kantrowitz, whose 2023 book, *Citizens of a Stolen Land*, chronicles the experiences of the Ho-Chunk Nation in Wisconsin. "The light bulb goes off and you think to yourself, 'Every square foot of this land used to be somebody else's — until pretty recently, and for a very long time. And how come I've never thought of that?'"

That's the central point of Kantrowitz's hometown course, which asks students to research and report on the connections between their own hometown — a place they're already deeply aware of and invested in — and Native American history.

Most of Kantrowitz's students have only a glancing awareness of this history when they come into his classroom, sometimes even the ones who grew up near Native communities in the Upper Midwest. Students from New York City, for instance, might not know much more than the popular, mythic story of Manhattan Island being bought for $24.

"Native people tend to disappear from the American history curriculum once it moves past the early 19th century," says Kantrowitz. "Native people didn't disappear from the United States, but they disappear from the curriculum by the Dawes Act in the 1880s, if not long before, and they very rarely make anything more than a cameo appearance in histories of the American 20th century or 21st century."

The first weeks of the class are organized around developing a kind of basic shared vocabulary of concepts, ideas, histories and approaches to historical research. Kantrowitz brings the students to the fourth floor of the Wisconsin Historical Society, where they get their hands on actual historical documents — personal letters, pamphlets, etc. — and their heads around the concept of archival research. Then they begin digging into the Native stories of their own hometowns.

Silas Cleveland, Jr. ('25), a Ho-Chunk student from the Black River Falls area who majored in history, didn't take Kantrowitz's hometown class, but he did take several others with him, including a class on Ho-Chunk history, and worked with him on a senior thesis. The senior thesis he researched to complete his degree would have perfectly fit the hometown syllabus. Cleveland uncovered that his ancestral tribe had been deeply involved in creating the thriving cranberry industry in nearby Central Wisconsin, which went into overdrive in the 1860s after a lumber boom (known colloquially as "The Cut") took down most of the trees in the area. For Cleveland, learning the story cast a new light on his own history. Two of his brothers had worked for local cranberry farms.

"Reading history books, especially about my own people, is how the hometown thing comes in," says Cleveland, who hopes to become a tribal lawyer. "When you're learning about yourself, it feels like you're learning more about your identity."

In researching his own hometown connection, Borok learned about the U.S. conquest of California in the 18th century. But he also learned about the political complexities that area tribes are facing in contemporary Los Angeles. Many of them have struggled to regain federal recognition and have fought bitterly over sites each has claimed as their homeland. In that sense, Borok's personal project tied neatly into one of the central concepts Kantrowitz hopes his students grasp: tribal sovereignty and the treaty relationships that currently exist between the United States and some (but not all) of the Native American tribes.

"My students all have to come into an awareness of Native people, not as isolated individuals, not as vanishing, not as subjects of plight or deprivation, but as communities of people enmeshed in a complicated history and a complicated relationship to non-Native communities in the United States," says Kantrowitz. "For a lot of the students, those are the kinds of stories that they end up telling in this class."

Kantrowitz likes to think of history as a glass plate holograph that's been smashed into a million pieces on the floor. Each piece contains the entire image — but from a particular angle and at a resolution dependent on the fragment's size. The hometown stories his students rediscover are like shards of Native American history.

"The smaller the story gets, the harder it is to resolve the whole larger story from it," he says. "But the stories are in there, if you're creative enough about how you approach it and think about it." ■

FACULTY

# The Long View

Mark Copelovitch tries to unravel the ever-shifting landscapes of international relations and economic markets.

BY AARON R. CONKLIN

**Earlier in his academic career,** Mark Copelovitch would occasionally get into the kind of casual conversations you have with people in airports. When strangers would ask him what he did for a living, he'd reply, "I'm a political scientist." Typically, the response would be something along the lines of, "Oh, it must be so interesting right now."

That was back in the mid-2000s. The definition of "interesting" now has a whole new connotation.

"I study international political economy, international relations and European politics," says Copelovitch, a professor of political science and in the La Follette School of Public Affairs. "My interests are at the intersection of all those things, which means that, right now, there are 97 crises going on."

It's not quite 99 problems, but it's close. Since the beginning of 2025 alone, Copelovitch's growing list of problematic developments has included the changing U.S. tariff strategy, a trade war with Europe, the question of whether NATO will continue to arm Ukraine, questions about cryptocurrency and debates around decisions of the U.S. Federal Reserve. All of these issues directly affect the global economy and the role of the U.S. dollar as the dominant currency, and all of them create a troubling amount of uncertainty in international politics.

"This is the fundamental thing we as international relations scholars talk about to our students," says Copelovitch. "Bad things happen in world politics when there's uncertainty. Whether you're talking about war and security policy, nuclear weapons, international trade, money and finance, or environmental policy, mitigating uncertainty is the main goal. And now, we're the chaos agent."

Current events have raised plenty of concerns about the health of U.S. democracy and its political institutions. But unlike some of his international colleagues, Copelovitch finds he's less concerned about the United States embracing isolationism and losing its power on the global stage.

"We're in this paradoxical position where American democracy is deeply under threat at home and America's commitment abroad to our closest allies and international cooperation is in serious doubt. And yet, because of the dollar's entrenched dominance in global finance and the world economy, we are still more powerful than any other country in the world," he says.

According to Copelovitch, international money and finance are a clearer indicator of global power than military might or population or GDP or other metrics, and about 70% of the global economy — trade, investment and financial transactions — runs on dollars. That fact means that other major global actors, like China and the European Union, aren't really in position to unseat the United States as top dog. Both have their own sets of political challenges, many of which make America's democracy concerns pale in comparison. And both would have to take drastic measures, including completely reversing many of their current economic policies, privatizing their banks and/or growing their financial markets to levels comparable to the United States, in order for their currencies to replace the dollar as the dominant international currency. All of that seems highly unlikely in either the next few years or even the remainder of the 21st century, says Copelovitch.


PHOTO: SHANHONG YU

Mark Copelovitch looks beyond the day-to-day headlines on economics and politics to analyze long-term impact.

"As bad as things seem right now, it's like we're the least ugly contestant in the global beauty contest for power in world politics," he quips.

Current political upheavals and dramatic shifts in U.S. economic policies may seem more severe in the moment than at other points in recent history. But from Copelovitch's perspective, the United States has been in an era of deep economic and political uncertainty since the financial crisis of 2008, and yet the U.S. dollar has remained the world's reserve currency through all of it.

"People have been predicting the end of American hegemony since Richard Nixon took us off of gold in 1971," says Copelovitch. "And it keeps *not* happening. As scholars, it should puzzle us that so many people have predicted something for the last 50 years, yet it keeps not happening."

Copelovitch reminds his students that it's important to hold two thoughts in their heads at the same time: The United States can be facing very serious domestic political challenges, even as it retains enormous structural power advantages in the international system especially given the country's global financial dominance. As Americans, sometimes it's difficult to see that other countries' problems are at least as serious as America's and that short-term domestic political developments do not mean the basic foundations of world order have completely changed. That's a perspective he tries to convey to the students in his international relations classes, most of whom don't have the same experience or long view.

"Our students' entire adult awareness of the world is of a world in constant economic and political crisis," he notes. "The post-Cold War era of optimism and stability, and the early 2000s when the economy was running along, and everybody thought everything was fantastic and stable — they don't have any sense of that stability."

It isn't easy teaching students about how international organizations like the World Trade Organization or NATO work, or about how states sign and comply with trade agreements and other international treaties, in a world where many of those things are not currently working as they traditionally have. But Copelovitch believes it's still critical for them to understand why the United States led the creation of those international institutions in the first place, and why they have made the world safer and more prosperous over the last 80 years.

"I'm somebody who is motivated by empirical puzzles," says Copelovitch. "There's real-world stuff happening, and we want to try and explain it — to try and understand what exactly happened that got us here. Because then maybe we can be better about thinking about what happens going forward." ■

STUDENTS

# Magic School Boat

With Ms. Frizzle–level zeal and cross-cutting aspirations, Jumana Tanner embarked on the adventure of a lifetime with UW Marine Biology in the Florida Keys.

BY ABBY ANDERSON

**Night snorkeling.** It's the memory that stands out most to Jumana Tanner ('25) when she looks back at her experience studying abroad in the Florida Keys. She and a group of fellow students were out with their professor searching for ostracods. These tiny bioluminescent crustaceans flash in the water like little blue holiday lights. But before they could experience the twinkling display, the group of intrepid researchers were swarmed by spindly, ballyhoo fish that were attracted to their flashlights.

"All of a sudden, there's fish flying at you in your face," says Tanner, who graduated in August with majors in zoology and neurobiology. "I've never seen anything like this in my life."

In January of 2023, this group of what Tanner calls "ballyhoo survivors" were part of the inaugural cohort of the UW Marine Biology in the Florida Keys study abroad program, which was full of once-in-a-lifetime opportunities like this one. For two weeks, students got a hands-on introduction to coral reefs, seagrasses, mangroves and other coastal marine habitats.

This immersive aspect was especially appealing to Tanner as a curious, adventuresome and overall exuberant individual. She applied in the fall of her junior year, her purpose statement: to bridge the gap between science, communication, art and people.

"I want to conduct research and teach science to the public so that I can be a part of making sure people understand science," she says, adding that she hopes to pursue a graduate degree in marine biology. "I want to work in education, but I want to start with research. Maybe someday I'll have some type of lab on a boat where I take students out and have them connect something with themselves, the water, science and art — something like 'The Magic School Bus,' but on the water."

Her avant-garde style is built around meeting people where they are, which is exactly what the marine biology experience did for her.

"I grew up swimming, but I'd never snorkeled before, and I'd never been on a boat in the ocean," she says. "It was huge personal growth for me to start learning things about myself while also trying to swim in this big ocean. It took everything that I love and everything I'm continuing to pursue, and it put a magnifying glass on it."

The Keys Marine Laboratory (KML) offers a unique opportunity to study the only tropical marine ecosystem in the continental United States. UW–Madison faculty and students stay in Layton — an ideal location for easy access to Florida Bay, the Everglades National Park, the Florida Current and the Florida Keys National Marine Sanctuary — where they engage in lectures and field-based research projects.

Program participants were eased into the excursion-heavy regimen at the start of the two weeks. The first session they went out from the beach.

"We were in this knee-deep mucky stuff," says Allison Forsythe ('23), who was part of the same cohort as Tanner. "We saw this giant sea slug that one of our professors got so excited about. He scooped it up on his flipper and was showing everybody. We took it back to the Marine Lab, and it was our little class pet over the trip."

Jumana Tanner and a teammate wade into aquatic exploration.



The sea urchins were brought back to the marine lab to observe movement and algae food preference.

Intrepid explorers snorkel off the coast of Marathon Key.

PHOTOS: COURTESY OF JUMANA TANNER

Forsythe, who completed her bachelor's degree in zoology and is now a student in the School of Veterinary Medicine, says the program itself is phenomenal. She remembers snorkeling every day and seeing urchins, sea stars, reef outcroppings, sea turtles, stingrays, nurse sharks and fish. But in her mind, the best part was the people.

"The instructors who ran it were so passionate about what they did and so excited to be there teaching," says Forsythe. "The community of it was huge. We were out there snorkeling all day, every day. Everybody was collaborative, and it was such a great group of people. We were all in the same boat together."

She was referring to the 20 or so people packed in the literal research boat, but it works both ways.

The program was intensive, and they were very much in it together. For Tanner, on a surface level, it was especially cool to experience what it could be like to be a marine biologist — but it also ran deeper than that.

> **"It took everything that I love and everything I'm continuing to pursue, and it put a magnifying glass on it."**
>
> JUMANA TANNER

"I have such distinct memories of the times when we were snorkeling," Tanner says. "It was also such a personal growth journey for me, because there were great moments but also moments when I thought 'I'm struggling,' and I had to overcome that."

In the end, "the ballyhoo incident" made it into the great moment category. Sometimes Tanner dreams about the bioluminescence — how she waved her hand in the water and sprinkles of blue light followed it. Like the fish swarm, she had never seen anything like it in her life.

"I learned how intense the ocean is, yet how calm and balanced it is," Tanner says. "For me, it was like taking everything you could possibly think about the entire world and how it all connects — the balance between chaos and peace — and putting it in an image for you." ■

RESEARCH

# Hidden in Another Story

Christy Clark-Pujara uncovers the hard-to-find stories of Black settlers in Wisconsin.

BY AARON R. CONKLIN

**As a historian,** Christy Clark-Pujara likes to rely on concrete examples. And the one she chooses from her latest book project, *Black on the Midwestern Frontier: From Slavery to Suffrage in the Wisconsin Territory, 1725–1868*, is an eyebrow-raiser. She went hunting for information about Toby, Tom, Lear, Jim and Joe, the five enslaved people who accompanied Wisconsin's first territorial governor Henry Dodge when he migrated to the area in 1827. She headed to the Wisconsin Room at UW–Platteville, which houses Dodge's historical papers.

"You can find his business records, his personal records and the year he became a politician, but when we're talking about the five enslaved people that accompanied him … it's not there," says Clark-Pujara, who is the chair and a professor in the Department of African American Studies. "The stories of African Americans in Wisconsin are buried in the records of the powerful."

Clark-Pujara has made it her mission to slowly and painstakingly uncover them and, in doing so, reveal the ways that Black people sought freedom and liberty in a place where there were relatively few of them.

Wisconsin became a territory as part of the Northwest Ordinance of 1787. The ordinance forbade slavery, but the practice continued through what Clark-Pujara has come to call "community consent." While slavery in the Midwest was sparse and irregular, the ways in which white men in Wisconsin configured early laws to exclude Black settlers from voting and incorporating towns are often shocking. Clark-Pujara always makes a point of sharing the state's 1848 Constitution with her students. The first clause of the article on suffrage declares that you must be a white citizen to vote but also allowed foreign-born white men who declared an intention to become a citizen. In other words, the requirement for voting was wrapped up in whiteness, not citizenship.

"The debate was over if Black people could become citizens and be considered worthy settlers and Americans," Clark-Pujara says. "African Americans are asserting that they are, and many white settlers are asserting that they are not."

Sometimes, Clark-Pujara finds Black settlers' voices directly in documents. In 1845, Benjamin A. Hughes and 12 other African American residents in Racine County petitioned the Wisconsin territorial legislature, challenging the racist statute that barred them from participating in the electoral process despite being free men. She also conducts research about Ezekiel Gillespie, a former enslaved person who filed suit to finally extend Black men the right to vote in Wisconsin in 1866.

"I think it's really important to understand that the history of Africans and African Americans in this country and in the state of Wisconsin is not history for Black people," Clark-Pujara says. "It's history for all of us. It's the history of this state. It's the history of this nation." ■

PHOTO: HOPE KELHAM



CULTURE

# Cautionary Tales

Six life lessons distilled from the fairy tales of Hans Christian Andersen

BY ALLI WATTERS

**The Little Mermaid, The Princess and the Pea and The Ugly Duckling.** These are just a few of the internationally renowned fairy tales Danish author Hans Christian Andersen brought to life. The stories are also the subject of a popular class taught by Claus Elholm Andersen (no relation). The associate chair for the Department of German, Nordic, and Slavic+ and Paul and Renate Madsen Associate Professor of Scandinavian Studies says the persistent appeal of these fairy tales has a lot to do with the author himself, who lived in poverty before his writing catapulted him into fame and fortune in 1835. His success coincided with the rise of capitalism in Denmark, which explains some of the timeless commentaries on class, politics and inequality.

"His journey from rags to riches wouldn't have been possible without this new capitalism," says Claus, who spent his summer completing a book on this topic and serving as a research fellow at the Hans Christian Andersen Center in Denmark. "But at the same time, he also saw the downsides, and how it comes with power, exploitation and hypocrisy." Here's a closer look at some of his fairy tales and the lessons they convey. ■

**What happens when you lose your riches?** This is the scenario for a soldier in *The Tinder Box*, which was the first story in Andersen's first collection. The soldier is forced out of his cozy room at an inn and moved into a tiny space under the attic, and his friends stop visiting him because there are "too many stairs." "This is a devious little sentence," Claus says, commenting on how the story addresses poverty and inequality. "Because children would know this is not the case."

**Should a king listen to the people?** One of Andersen's most popular stories in Denmark is *The Nightingale*, which came out in the midst of a Danish debate about freedom of expression. But the story is set in China. "There was a tradition of using China as an example when you wanted to write allegories about Danish politics and culture, because then it wouldn't get censored," Claus says. The bird in the story – a magnificent nightingale with a beautiful singing voice – symbolizes the voice of the people. Throughout the story, the king tries to stop it from leaving the castle, but it insists on its freedom and sharing stories from across the land.

**Should we care about something as superficial as a pea?** At roughly 350 words, *The Princess and the Pea* packs a lot into a small space. It goes like this: A prince is looking for a "real princess," yet when one comes knocking on the castle door, they don't believe her. So, they develop a test, placing a tiny pea under 20 mattresses to see if she can feel it. When she wakes up black and blue, that's how they know she is a "real princess." "He seems to be mocking this idea," Claus says about the unrealistic expectations that were placed on women and girls. "He's telling the bourgeoisie to look at what they're doing and see how ridiculous it is."

**When does greed go too far?** In *Little Claus and Big Claus*, children laugh along as they read the tales of how the underdog, Little Claus, repeatedly outsmarts Big Claus. But as the story goes on, there's a shift. Little Claus grows richer as Big Claus suffers, eventually being sentenced to death by his smaller nemesis. "There's a dissonance in his victories, because he becomes greedy," says Claus. He sees the fairy tale as a metaphor for the transition from feudalism to capitalism. Suddenly, people were able to rise above their class, but it came with the risk of becoming addicted to always wanting more – and a willingness to harm others to get it.

**What were the consequences of the Industrial Revolution?** They're on full display in the tragedy of *The Little Match Girl*. The story is considered a universal depiction of poverty, but the heart of it is the commentary on the Industrial Revolution. The first matchstick factories opened in Copenhagen a few years before the story was written, and children as young as six worked on the factory floors like the protagonist. The story ends when the girl freezes to death surrounded by burned matches. Andersen writes: "No one imagined what beautiful things she had seen." Claus says this is a call to action from the author to share her story and warn about the poverty happening because of industrialization.

**Is a happy ending possible?** Everyone knows the story of *The Ugly Duckling*. The poor flapper goes through so much hardship and bullying over the course of the story, but at the end readers are expected to believe everything is okay, because now he is a beautiful swan. "Andersen knew this wasn't fully convincing," Claus says. This story is often seen as symbolizing Andersen's own journey of becoming a self-made success, but it's on record that he was miserable in his glamorous new life. "Even though he got this fame and he became the swan – or in his case a famous author – it did not buy him happiness," Claus adds.

ILLUSTRATIONS: TIM MADLE

# FLOOD ZONE

This year, the United States witnessed some of the worst flooding events in recent history. Researchers from multiple departments in the College of Letters & Science are focused on finding ways to address what has become a rising issue.

BY AARON R. CONKLIN

## THE SUMMER OF FLOODING

When the raindrops first began to fall in Central Texas early on the morning of the Fourth of July, nobody suspected that a mere three hours later, nearly seven inches of torrential downpour would swell the waters of the nearby Guadalupe River into a devastating flood that would tragically decimate a summer camp, wash out several communities and claim the lives of 135 people.

But events like the floods that devastated Kerr County are no longer unusual. This year alone, major flooding events have impacted areas in Kentucky, New Mexico and New Jersey. Not even Wisconsin and the Midwest have been immune: In August, flash flooding caused by storms in the greater Milwaukee area destroyed 51 homes, causing more than $76 million in damage. Scientists have dubbed 2025 "The Summer of Flooding."

Andrea Dutton is surprised by exactly none of this. The Helen Jupnik Endowed Research Professor of Geoscience has spent her entire research career studying the historical

ILLUSTRATIONS: MATT CHASE

connection between melting ice sheets and rising sea levels, with the aim of predicting how the latter is likely to play out in a world impacted by warming temperatures and climate change. She's one of the world's preeminent experts on the topic and also one of the most persistent voices warning communities — both on the ocean coasts and in the Midwest — about the flooding dangers posed by rising water levels.

"Communities need to know what's going to happen, and that won't be just sea level rise," says Dutton. "Higher temperatures hold more moisture in the atmosphere. So, when it rains, you're getting more intense rainfall, and you'll have that superimposed on sea level rise, and you'll have more intense hurricanes superimposed on top of that."

What Dutton is discussing is a concept known as compound flooding, and it's recently become a new focus of her research. Backed by a UW–Madison 2025 Research Forward grant, she's collaborating with faculty in the College of Engineering and the College of Agriculture & Life Sciences to better constrain ice sheet disintegration and explore what compound flooding might look like in the future. Within that same grant, she's also partnering with science communicators across campus to develop surveys so that she can listen to the people who will be impacted and understand their needs.

"We can't walk into communities as scientists and say, 'OK, this is what you need to do, and you just need to accept it,'" says Dutton. "That's not going to work."

The surveys will look at learning what is most important to people who live in flood-prone regions, with the aim of better designing science objectives and providing meaningful results to them. Dutton likens it to a patient visiting a doctor and being told they have heart disease and could be dead within the next five years: Do they continue their risky lifestyle, or do they take dramatic action to effect change? By getting communities that haven't already been affected by flooding to think about what it could mean for their lives, she's hoping communities won't wait to do what cities in states like Louisiana and New York did only after devastation struck — creating berms and flood barriers and implementing green infrastructure to mitigate urban flooding.

"Is it that they can't drive their cars down the street one day a year because of sea water flooding the road?" she asks. "Or is it five days a year? Maybe they can tolerate that. Well, what if it's five days in a row? What's their tipping point?"

Dutton keenly understands that it's difficult for the public, most of whom have plenty of short-term concerns to distract them from what seems like very slow-moving problems like climate change. After all, she's been sounding the alarm on it for decades now. But ignoring it risks eventually crossing a tipping point at which sea level rise and flooding threaten health and stability. Dutton points out that residents in a state like Wisconsin might not find themselves directly impacted by flooding caused by a hurricane in Texas, but the ripple effects could reach them. If flooding were to collapse the coastal housing market, it could have a profound impact on the national economy. And, potentially, more.

"If people can't live in a place anymore, they're going to have to retreat somewhere — and Wisconsin is probably going to become very popular," she says. "We're going to have problems just within our own country, about where people can live safely, and that habitable safe space is shrinking very rapidly."

The issue isn't likely to improve on its own. In a study released earlier this year, Dutton and several research colleagues argued that the 1.5-degree Celsius warming limit adopted by the Paris Climate Agreement — an agreement the United States has opted out of — is too high, and that such levels of warming are likely to cause polar ice sheets to melt at a rate that could cause sea levels to rise by several meters in the coming centuries. That's the kind of increase that could erode coastlines, submerge the Florida Keys and cause even more serious flooding in coastal communities.

Dutton thinks about a picture that hangs on her office wall of a visit she made to an art exhibit in Florida that featured images of people standing in water in the places where they live. The photographer took a photo of Dutton standing in front of the framed images, using a glass prism to make it appear as though Dutton was standing in water as well.

"To me, seeing the people in the water is much more impactful than just seeing pictures of buildings with water," she says. "It's all about, how does it impact humans? How does it impact the people we care about? The more people who see that and get that message, the more inclined they'll be to act on it."

## IN THE NEIGHBORHOOD

Max Besbris didn't see himself as somebody who studied environmental flooding, even though disasters and the environment are both key parts of sociology, his chosen academic field.

But that changed in 2017 when Besbris, the H.I. Romnes Associate Professor of Sociology, was living in Houston. He was studying the impact of Hurricane Harvey, the largest rain event in United States history, and he found an unexpected calling.

"As someone who studied neighborhoods and studied residential mobility, it occurred to me that as more intense rain events and more unpredictable flooding become more commonplace because of global warming, this might matter for residential mobility," says Besbris.

"This also might matter for neighborhood inequality, the things that I had been trained to study."

So Besbris and a colleague from Rice University, where he was teaching at the time, decided to zero in on Friendswood, a middle-class professional neighborhood outside of Houston. About a third of the town suffered serious flooding in the wake of Harvey. Besbris spent two years tracking and interviewing affected residents about their experiences.

The result of their work was a book called *Soaking the Middle Class: Suburban Inequality and Recovering from Disaster*, an ethnography that charted how financial factors and community ties often impacted a family's ability to recover from a flooding event, even within a well-resourced community.

Not surprisingly, Besbris discovered that whether a homeowner had a flood insurance policy was a significant determining factor for repair and recovery. Those who did were able to receive payments of up to $350,000 for their homes and personal property; those without insurance could only apply to the Federal Emergency Management Agency (FEMA) for direct aid, in an amount typically in the mid-to-low $30,000 range.

**"You literally had neighbors getting exponentially different amounts of money for their recovery after flooding basically the same amount."**
MAX BESBRIS

"You literally had neighbors getting exponentially different amounts of money for their recovery after flooding basically the same amount," says Besbris. "And that was one thing that was really important in determining whether or not, two years after the flood, households were built back up."

A family's social ties were also critical to recovery. But they were also critical to something else: a family's decision to stay and try to rebuild in an area at high risk for future flooding events. Many Friendswood residents whose homes were destroyed decided to stay.

"People have a lot of place attachment, particularly to a place with a really good reputation, so people don't want to leave," Besbris explains. "But what we found is that people don't really have alternatives. People don't really have places in mind that they would go."

Besbris has been a longtime proponent of the concept of managed retreat, the idea that instead of spending resources to rebuild homes in areas where floods have struck and flooding risks remain high, individuals instead consider the possibility of using their resources to move to parts of the country where the risks are lower.

"We need to be thinking about alternative ways to live that aren't in these high-risk areas," he says. "That means not just telling people that these places are risky but offering them real, compelling alternative places that have a high quality of life."

Improving disaster and risk messaging may be a necessary first step. Besbris' Houston research revealed that people don't really have a great sense of what their risk is, no matter where they live. An almost equal number of Friendswood residents were convinced that Hurricane Harvey was a once-in-a lifetime event versus those who believed severe flooding was likely to occur again.

Some momentum — and strain — is likely to begin occurring in areas of the country where people are no longer able to get flood insurance for their homes. Years of devastating storms and floods have pushed several major insurance companies to withdraw coverage availability from homes in coastal communities at higher risk for flooding events, a move that's already having an impact on tax bases and mortgage-lending policies.

One potential solution to this problem may be a re-examination of a public insurance model — a government-backed model that provides coverage to individuals with a more holistic vision of what is risky as opposed to a profit-based model.

"That doesn't mean discouraging people from moving; it means not making these decisions based solely on share-holder value, but instead on what is best for households and communities," Besbris says.

Besbris knows there's much more to dig into related to catastrophic flooding. He's planning to examine the effects of flooding on the real estate market. How do housing values change in the wake of events like this? How are people deciding where they want to live and when they want to leave?

"I hesitate to say this, but I think researching environmental disasters is a growth industry, and I don't mean that in a positive way," says Besbris. "I mean it in a necessary way. We need to understand what the impacts of these events are and hopefully try to start building out some mitigation models that can be scaled."

**MELTDOWN**

Luke Zoet, professor and Dean L. Morgridge Chair in Geoscience, and Marianne Haseloff, assistant professor in the Department of Geoscience, are using a grant from the Arête Glacier Initiative to understand the movement and melting of giant glaciers, potentially reducing their impact on sea level rise. Watch the video at **go.wisc.edu/lsglaciers**.

## BUILDING A ROAD MAP

Turns out you can add "preparing for and recovering from floods" to the list of things that take a village.

Ed Boswell (PhD'18), a teaching faculty member in the Department of Planning and Landscape Architecture, teaches his students how to apply geographic information systems (GIS) and geodesign to a host of environmental issues, including helping communities across Wisconsin prepare for severe flooding events and other hazards. His students effectively become connectors that use the information these systems provide to unite a wide range of disparate groups to find workable solutions. This work happens through coursework and community-based learning through UW–Madison programs such as the UniverCity Alliance and the Rural Partnerships Institute.

"Geodesign is focused on tools for visualization, analysis and, importantly, stakeholder input to create planning and design scenarios," says Boswell. "What's cool is this process facilitates input from engineers who model flooding, community members who can tell us where flooding has occurred in the past and municipalities who put plans into action. My goal in teaching is to underscore the importance of bringing these disciplines into the process."

Boswell's students work primarily with ArcGIS, a comprehensive geospatial platform, to learn tools and processes to involve multiple stakeholders and ultimately help inform planning and design decisions.

In partnership with UW Sea Grant and Silvernail Studio for Geodesign, Boswell and his students linked ArcGIS online applications to a prototype digital sketching and tracking tool they're calling ScenarioStudio. The tool enables design and planning teams together with stakeholders to design scenarios with green infrastructure or other landscape practices on the fly, then visualize and compare their potential impact in real time, all informed by existing spatial data.

"Say, for instance, that we want to increase the amount of stormwater that can be absorbed in an area by incorporating green infrastructure and reducing the amount of impermeable surfaces," says Boswell. "In the early phase of planning and design, we can use these tools to visualize topography, soil data and other existing conditions to inform the placement of green infrastructure."

Critically, the tools include key performance indicators (KPIs), a measurement that indicates, for example, how much stormwater a particular strategy is likely to capture and how much it may cost to install and maintain. These data are displayed in real time through dashboards that are easy to interpret.

As part of a UniverCity Alliance UniverCity Year project, Boswell's students have helped communities in the Koshkonong Creek watershed in Wisconsin respond to frequent flooding events and created an ArcGIS StoryMap to assist the City of Waupaca with communicating information on a potential dam removal project.

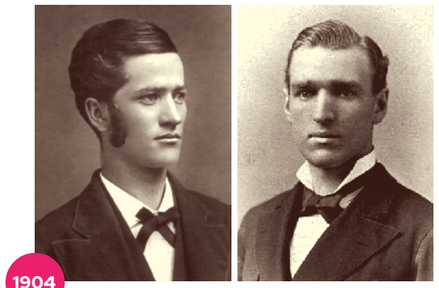
More than anything else, Boswell's classroom strategy aims to take a big-picture approach to flood risk.

"These tools and approaches encourage us to think on a regional or watershed scale," he says. "The water doesn't care where municipalities end. We need to think on that scale and erase the boundaries." ■

# The Road to Discovery

As the liberal arts college of a major research university, the College of Letters & Science is uniquely positioned to tackle some of the biggest questions facing our society. Take a trip down memory lane with us, as we look back at some of our most notable research discoveries and the winding roads that led to them.

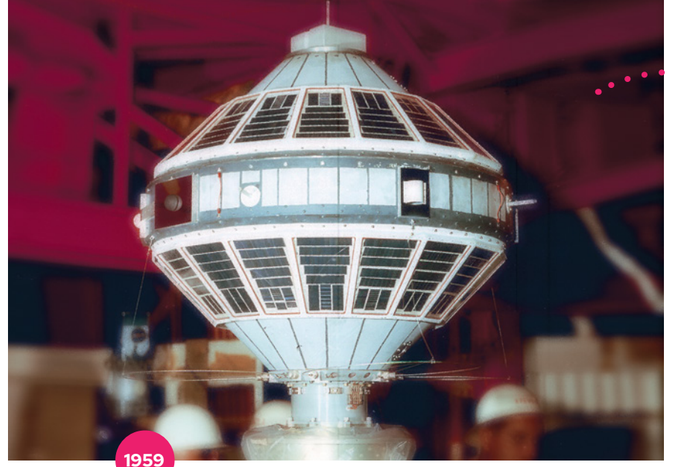
**BY ALLI WATTERS AND SCOTT A. CARTER**



1904

## The Idea That Started It All

The Wisconsin Idea is UW–Madison's foundation. It's the time-tested notion that the work done and discoveries made within the boundaries of the University should stretch beyond campus and directly impact the lives of others. And that idea was sparked by a pair of alumni with strong L&S ties. Bob La Follette (1879) and Charles Van Hise (1879, 1880, MS'1882, PhD'1892) met as undergraduates on campus and were moved by then–University President John Bascom's belief that the University's service to the state was a moral obligation. The pair walked the walk when they landed influential roles in the state and University respectively, putting the official philosophy into writing to serve as a guiding light for generations to come. "I shall never be content until the beneficent influence of the University reaches every family of the state," Van Hise said in 1905.

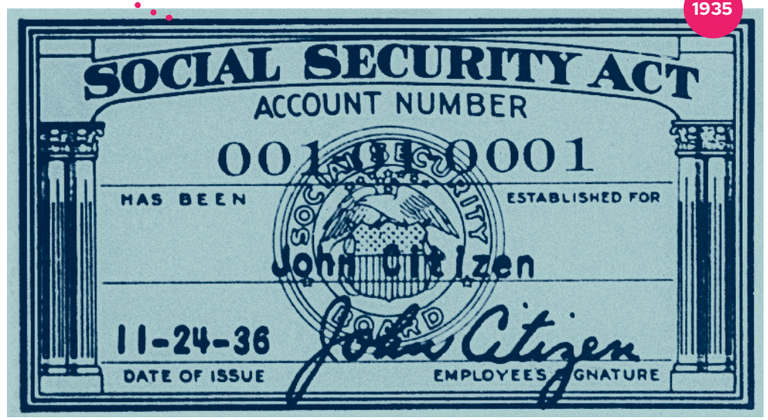


1959

## Into Orbit

Verner Suomi—known as the mind behind modern meteorology—was a relentless problem-solver. He once fashioned a propeller out of wood in a pinch when his boat broke down, and he used that nimble brain of his to tackle big questions. A major one on his mind: How much heat is emitted by cornfields? It led to bigger queries about understanding the heat budget of the entire planet, which made him realize he needed to get measurements from orbit. He worked with Robert Parent, an engineering professor, to create the first weather satellites to measure Earth's radiation balance. Launched in 1959 aboard the Explorer VII satellite, the instrument became the basis of history's first successful meteorological experiment from space. Without weather satellite technology, we would be in the dark about crucial weather events. The Department of Atmospheric and Oceanic Sciences within the College of Letters & Science remains at the forefront of this crucial field of study to this day.

IMAGE: COURTESY OF NASA




1935

## A Big New Deal

Edwin Witte (1909, PhD'27)—yes, the namesake of the populous southeast neighborhood residence hall—is also known as the father of Social Security. But before he was a trusted advisor under President Franklin D. Roosevelt, he was the protégé of John Commons, a professor of economics and historian of American labor. Witte spent several years working for Wisconsin's Legislative Reference Library before joining the UW faculty, helping to draft a series of state laws. When he moved to Washington, D.C., he served as the executive director of the committee that was tasked with crafting the legislation that would eventually become the Social Security Act of 1935. He then came back to campus, where he served on the Department of Economics faculty. Today, Social Security has become a social safety net that provides monthly income for about one in five U.S. residents.

IMAGE: GRANGER

1963

## On the Map

When teachers unfurl those giant maps in their classrooms, it's Arthur Robinson's (MA'38) design. The professor of geography was on a mission to fit a spherical globe onto a two-dimensional map. For hundreds of years, sailors were depending on maps to navigate the seas, but they were distorting the size of countries and continents in the Northern Hemisphere. Greenland was the same size as Africa, even though Africa's land mass is 14 times larger. To solve this, in 1963 he reimagined the Earth in an elliptical-shaped projection. And because of his fondness for aesthetics, he beat out a competing map project, and his model was adopted by the National Geographic Society, making it widely used around the globe.

IMAGE: DANIEL R. STREBE

1965

## Cognitive Computing

Sister Mary Kenneth Keller (PhD'65) was teaching high school math on the west side of Chicago in the early 1960s when she had a realization: Computers are an increasingly important tool in mathematical computation. This led her to continue her education, eventually becoming the first woman (and only the second person) in the country to receive a doctorate in computer sciences. Her dissertation, "Inductive Inference on Computer Generated Patterns," was among the earliest academic studies that addressed how computers could be used to mechanize tasks and solve problems. "For the first time, we can now mechanically simulate the cognitive process," she wrote. "We can make studies in artificial intelligence."

IMAGE: COURTESY OF CLARKE UNIVERSITY ARCHIVES

1968

## Spaced Out

In the midst of the Space Race, a plucky band of UW–Madison astronomers helped design the world's first autonomous space-based astronomical observatory. Led by Arthur Code, a professor of astronomy, they built a suite of telescopes that would be launched aboard NASA's Orbiting Astronomical Observatory 2 (nicknamed Stargazer). This work launched the field of space-based astronomy and opened the doors for future projects like the Hubble Telescope and James Webb Space Telescope, which also had UW–Madison members playing crucial roles in their development.

IMAGE: COURTESY OF NASA

1978

## A Bit Corny

Hugh Iltis, a fiery botanist with a passion for conservation, might be best remembered for his hands-on teaching style and work saving bald eagle populations, but his plant explorations led to crucial discoveries that impacted long-term agriculture. He discovered two species in the tomato genus, including one that proved to have a trait sought in the canning industry. His most exciting find involves his famous holiday card, which portrayed a perennial species of teosinte—an ancestor of corn—and described it as "extinct in the wild." A botanist in Guadalajara showed the card to his students and challenged them to prove Iltis wrong. And they tried, eventually inviting him to ride a horse in the mountains and co-discover a new perennial species of corn. It resisted a series of viruses that afflicted corn and could crossbreed with the corn crop to offer great environmental advantages in preserving soil and reducing fuel use. In 1979, this discovery made the front page of the *New York Times*.

IMAGE: MICHAEL NEE

1996

## Disrupting Alzheimer's Disease

Emeritus Professor of Chemistry Laura Kiessling teamed up with Regina Murphy, a professor of chemical and biological engineering, to tackle a disease that afflicts millions of Americans. Alzheimer's manifests itself through progressively impaired memory, leading to mental confusion as the disease systematically destroys the brain one cell at a time. The pair's 1996 study revealed a way to disrupt the aggregation of proteins that form the poisonous plaque deposits found in the brains of Alzheimer's patients. This breakthrough has played a crucial role in efforts to make more effective treatments to help people struggling with the disease.

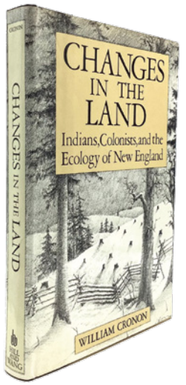
IMAGE: KOTO FEJA / GETTY

1996

## More Than Stories

Nellie Y. McKay redefined the landscape of literary studies. As a co-editor of the landmark *Norton Anthology of African American Literature*, published in 1996, she ensured that Black voices—and especially those of Black women—stood at the center of the canon. McKay was a trailblazer whose scholarship and teaching opened new fields of inquiry, reshaping how identity, race and culture are studied in American literature. Her work was not just about recovery, but about recognition, making clear that these stories were foundational to American literary history, not marginal. McKay's legacy endures in the discipline she transformed and in the countless students and scholars she inspired.

IMAGE: UNIVERSITY OF WISCONSIN–MADISON ARCHIVES

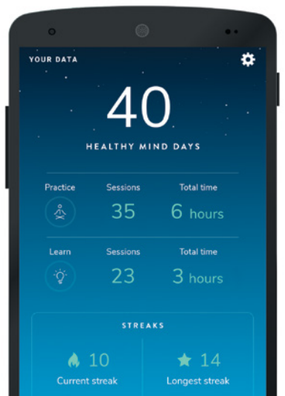



1983

## Writing Environmental History

William Cronon ('76) challenged the way we think about environmental history and how we inhabit the land. Before his books *Changes in the Land* (1983) and *Nature's Metropolis* (1991), it wasn't commonplace for scholars to discuss the inseparable nature of humans and the environment. Inspired by his upbringing in Madison and the teachings of great professors like Aldo Leopold, he showed that "wilderness" is never untouched, that cities are ecosystems and that the histories we tell about the environment shape the futures we create. Cronon made environmental history vivid, urgent and impossible to ignore, and he is often considered one of the founders of the field.

2019




## Training Your Brain

What makes a mind healthy? Building a scientific framework to understand how human flourishing can be nurtured is the heart of the work happening in the Center for Healthy Minds, a research center founded in 2019 and led by Richard Davidson, the William James and Vilas Professor of Psychology and Psychiatry. A friend and confidant of the Dalai Lama, Davidson has made his expertise and techniques widely available through the Healthy Minds app. It's a free tool that's been downloaded more than a million times by people looking to train their brain.

2024

## First Plasma

It was a big moment last year when UW–Madison's fusion energy research marked a major milestone: first plasma. The project, led by Professor of Physics Cary Forest ('86), aims to decarbonize the energy sector, and this was a huge step in that direction. The research is being conducted by the Wisconsin HTS Axisymmetric Mirror (WHAM), which started in 2020 as a partnership between UW–Madison, MIT and the company Commonwealth Fusion Systems. Now, WHAM will operate as a public–private partnership between UW–Madison and spinoff company Realta Fusion Inc., positioning it as a major force for fusion research. ■

IMAGE: BRYCE RICHTER

# Moving Forward

Researchers in L&S are continuing this important work, and there are many discoveries yet to come. Here are three arms of research to watch:

### The Living Refinery

Researchers from across campus are coming together for a project that could help overcome dependence on fossil fuel chemical production. Led by Professor of Botany Hiroshi Maeda, the idea is to create what they're calling a "living refinery," which is a plant-based way of using energy from the sun to convert atmospheric carbon dioxide into aromatic compounds.

### Origin Stories

Are we alone? Where do we come from? Why are we here? These are the types of questions being tackled by scientists in the Wisconsin Center for Origins Research (WiCOR), and they intend to get answers. The multidisciplinary center brings together minds from seven L&S departments.

### The Human Side of AI

The ethics, long-term impact and history of artificial intelligence are just a few of the topics being investigated by the College of Letters & Science's new Center for Humanistic Inquiry into AI and Uncertainty.

**There's so much more to discover!** Hear about the life and work of powerhouse researchers like George L. Mosse, Ada Deer ('57, Honorary PhD'74) and more at **go.wisc.edu/lsdiscoveries**.

# WISCONSIN FOR LIFE

PHOTOS: ANDY MANIS

After graduating from the College of Letters & Science, our alumni go on to do great things. And many of them stay here in the state of Wisconsin, where they are creating jobs, serving the community and advocating for impactful change. Meet three alumni who are making a difference in the Badger State.

**BY ARCHER PARQUETTE**

## THE ARTS ADVOCATE

**MARCELA "XELA" GARCÍA ('11, MA'24)** was 9 years old when she first walked into Walker's Point Center for the Arts (WPCA) in Milwaukee. She had moved to the United States only four years earlier with her parents and younger sister, after spending the first four years of her life in Jalisco, Mexico. Her mother worked at a clothing company a few blocks from the center, while her father cooked at a restaurant across town. When they heard about the center, which had just recently opened in 1987, they immediately signed their daughters up for after-school art classes.

"Growing up with parents that migrated, language barriers were there, cultural barriers were there," García says. "To them it was really important to find organizations where we could feel understood and safe, and to connect us to opportunities that were nurturing for us. The center was transformative for me and my sister. But, of course, when I was a little girl getting dropped off to paint and draw, I never thought that I'd be leading the organization one day."

Today, García is WPCA's executive director. Since 2016, she has steered the center through funding turbulence and the chaos of the pandemic and brought the same transformative arts experience to hundreds of Walker's Point children.

In 2002, García arrived at UW–Madison as part of the first class in the Precollege Enrichment Opportunity Program for Learning Excellence (PEOPLE), which provided her a full-tuition scholarship. She initially majored in bacteriology but quickly found lab work isolating and turned back to the love of the humanities she'd first found at WPCA, with majors in English literature and Chicanx/e and Latinx/e studies.

"I found a lot of passion in discovering the stories that not enough people have connected with," she says. "These are universal stories but because of the last name of the author or the platform where it's published, not everyone gets access to it."

After graduation, García worked in education and nonprofits, from associate program director for Partners Advancing Values in Education (PAVE) to a trustee for the Sigma Lambda Gamma Education Foundation. When she heard about the executive director leaving WPCA, she was immediately interested in returning to the place that meant so much to her as a child … but she was also clear-eyed and a little wary.

"I would have been the fourth director in a period of five years," she says. "So, I knew something was going on with leadership retention. Obviously, funding for the arts has been in decline for the last 20 to 30 years. I knew that I would be walking into something that maybe was not at its healthiest. I knew that this was going to be the biggest challenge I'd done professionally. And I was not wrong."

Early in her career, the center flooded and needed repairs. COVID forced a temporary migration to digital programming. The center went through multiple strategic plans, rebranded, and developed new programming and outreach. But García ended the trend of leadership exodus and stuck with the center, shepherding it through the pandemic to where it is today — a thriving place for kids to find passion for the arts and a sense of belonging, like García did decades ago.

"Everything I've done here is about making the center more reflective of the community we serve," she says. "It's not about me or about a legacy I'm leaving behind. That's the last thing on my mind. What matters is the number of kids who come through our doors and leave feeling more confident and more connected."

## THE CHEF

**LUKE ZAHM ('03) WILL NEVER FORGET ONE MEETING.** The Wisconsin chef was in Los Angeles, pitching ideas to a television producer. It was 2019, and over the past six years, Zahm had made a name for himself running Driftless Café in Viroqua, a small-town restaurant that became a regional phenomenon, drawing diners from Chicago, Milwaukee and Minneapolis. Now, after a few guest appearances on dining TV shows, his screen presence — inviting, knowledgeable, friendly — was drawing interest.

The producer thought Zahm had the skill to be a national TV personality, but there was one problem.

"No one cares about the Midwest," Zahm remembers the producer telling him.

If Zahm was going to one day host a national show, she said, it needed to be in New York or California — really anywhere that wasn't flyover country. The slight burned — Zahm had a chip on his shoulder about his home, one he'd had since he was a kid growing up in La Farge, a town of about 700 in Vernon County.

"One of the things I internalized growing up in rural Wisconsin was that if there were any bright spots in the universe that were really popping off, they were a long way from me," he says.

Long before he was running his own restaurant and taking meetings with TV producers, Zahm worked in kitchens while he was pursuing his undergraduate degree in law, society, and justice at UW–Madison. The work gave him a late-onset but powerful sense of pride for his Wisconsin home, where thousands of farmers were producing top-quality food served across the country. But cooking was still only a side gig. He had a different, hopefully more stable career in mind after graduation — he was going to be a lawyer.

He started law school, and at the same time his girlfriend-now-wife, Ruthie Zahm ('02), told him she was pregnant.

"We were at this precipice," he says. "I was like, 'Am I going to spend my life trying to manage other people's money problems, or am I going to do something I'm passionate about?' Thankfully, the passion won."

He dropped out of law school, and the soon-to-be-father started working full-time as a chef. Things got off to a bumpy start, with his first salaried job earning him $19,500 a year for 80-hour workweeks.

"It was brutal," he says. "But at the same time, I loved it. I loved the energy. I always felt like it was a gift to put a spotlight on the work and toil of Wisconsin farmers."

Zahm worked in several Madison restaurants and eventually in a higher paying corporate dining gig for about a decade after graduation before deciding in 2013 that it was time to take another risk.

"I always had this dream of owning my own restaurant," he says.

He unexpectedly stumbled on a 44-seat space in Viroqua, his wife's hometown only 12 miles from La Farge. When he opened his new Driftless Café in the building, he had outsized ambitions for the restaurant. First, he imposed some rules — 85% of all ingredients would be sourced from farms within 100 miles, and the menu would change every day. The hope was that this would provide a vibrant showcase for the variety and quality Wisconsin farmers and food producers had to offer — and that it would get diners in seats.

During one of the first nights of service at his new spot, Zahm served an early dinner to a group of Franciscan nuns from a nearby hermitage. Despite not being particularly religious, he wrote them a note asking if they wouldn't mind praying for the restaurant. "Literally an hour later, a server comes bursting into the kitchen and says, 'You've got to see this.' There's a line of people waiting outside. It's a two-hour wait to get in," Zahm says. "Our sous chef was like, 'Dude, make them stop praying.'"

The restaurant's success brought Zahm a lot of attention, including that frustrating meeting in Los Angeles. But soon after, Zahm was approached by a different TV producer, Arthur Ircink, with a much friendlier message. He wanted Zahm to host "Wisconsin Foodie" on PBS. The opportunity seemed perfect, because it would be a series that would give Zahm the chance to showcase his state and to prove that plenty of people "care about the Midwest."

He hosted his first episode in 2020, and now seven seasons later, he continues to grow the show. Its subject matter covers far and wide, from Milwaukee restaurants like The Diplomat to Kikkoman, the world's highest-producing soy sauce facility in Walworth, to Keewaydin Farms, a small organic farm in Viola. He's won three Chicago/Midwest Emmy Awards for his work, and Driftless Café keeps filling its seats every night.

"In times that feel really polarizing, when you see communities turning on each other, I've held fast to this idea that we can circumvent a lot of that conflict through food," Zahm says. "I don't care how you vote, I don't care how you pray, I don't care who or how you love, but at the end of the day everybody eats."



## THE SOCIAL WORKER

**ONE OF THE MOST REWARDING PARTS** of Heather Crowley's work happens at random. She could be shopping for groceries, picking up coffee or just walking down the block in Madison. Someone will approach her with a smile on their face, looking healthier and happier than she's ever seen them, and thank her for helping them turn their life around.

"We work with people during such vulnerable times in their lives," says Crowley ('96, MS'03), who's been a social worker for Dane County for 16 years and a behavioral health social worker at St. Mary's Hospital in Madison for more than a decade. "When someone comes up to me and offers up their story and says they're so proud of where they are, after having gone through a lot of struggles — it's amazing to know that we made that connection and that impact."

Crowley, a member of the Ho-Chunk Nation, came to campus after graduating from Holmen High School in La Crosse County. "I found my place at UW," says Crowley, who joined the Wunk Sheek Native American student group on campus.

She considered an English major and a marketing major before her interest in social work was sparked. She was initially interested in addressing alcohol and substance use, but in her research she quickly found that these issues have deep roots.

"There are cycles of behavior, mental health and intergenerational trauma that affect people, and often a negative coping mechanism like drug or alcohol use comes from that," she says. "If people don't have the opportunity to heal, that can go on to impact future generations. Those cyclical patterns really interested me."

After graduating with her undergraduate degree, Crowley went on to get her master's in social work also from UW–Madison. That launched her career in social work and mental health, including time spent as a child and family therapist at the Mental Health Center of Dane County, working as a victim advocate for the Dane County District Attorney and picking up emergency department shifts at St. Mary's. She joined Dane County as a social worker in 2009.

"I've seen clinical interventions around different ages and populations, but the young people have always stuck with me as a developmental stage where we really have the most ability to help someone change," she says.

Crowley began at the county in child protection and human services, then youth justice, and was promoted to social work supervisor 10 years ago. She runs the Early Intervention Services Unit, which does a vast amount of work in the community. They operate in three school districts, do outreach to students at high risk of joining gangs, work in human trafficking prevention and intervention, and more. The unit is the only one of its kind in Wisconsin, aimed at reaching high-risk young people early.

"We're starting something new here," she says. "I think our work can help other counties and other social workers think forward about how to work with community and collaborate in a better way." ■

Pictured from left to right, Chemistry Professor Kyoung-Shin Choi and staff scientist Do-Hwan Nam listen as graduate student Brian Foster (MS'24) summarizes an experiment in Choi's research lab.

PHOTO: JEFF MILLER

## Charged Up

The boom in electric vehicles (EVs) has represented a huge boon to the environment, with one notable and critical drawback: The precious lithium that powers many newer EV batteries is difficult, expensive and environmentally problematic to recycle once the battery has been spent.

Enter Professor of Chemistry Kyoung-Shin Choi, who leads a research team that has found a way to use an electrochemical process she developed to recycle lithium from certain types of EV batteries efficiently and inexpensively.

Choi's process involves using a lithium-ion storage electrode to extract lithium ions from spent lithium iron phosphate (LFP) batteries, a popular type of EV battery used by manufacturing companies like Tesla and BYD. The ions are then released into a separate solution and recovered as high-purity lithium chemicals.

Choi has used similar electrochemical approaches to desalinate ocean water and remove chloride and phosphate from wastewater. Her lithium proof of concept has already caught the eyes of battery and car manufacturers. Her team has applied for a patent and is currently working on ways to commercially scale up the process.

"The technology works, but it is important to scale it up in the most cost-effective manner," Choi says.

## MAPPING THE WISCONSIN IDEA

READ HOW L&S IMPACTS EACH OF WISCONSIN'S 72 COUNTIES AT GO.WISC.EDU/LS72

### ADAMS COUNTY

Adams County is known for summer outdoor fun, but keeping those numbers up during the winter is challenging. To address this, students in a School of Journalism and Mass Communication class on creative campaign messages pulled together a detailed multimedia strategy to boost winter tourism and support the local economy.

### CLARK COUNTY

In public schools, students get access to free hearing tests, but many Amish and Mennonite families in rural Wisconsin don't have access to these healthcare resources. To counter this gap, faculty and students in the audiology program in the Department of Communication Sciences and Disorders created audiology clinics to offer free hearing tests for families in Wisconsin communities, including Clark County.

### DOOR COUNTY

Wildlife poaching is a problem in several Wisconsin counties, including Door County, which supports year-round traffic from both tourists and hunters. It's often difficult for the U.S. Fish and Wildlife Service to determine if poaching has occurred. Brian Beard, a distinguished scientist and associate research professor emeritus in the Department of Geoscience, used forensic science to help USFW officers create investigation practices.



## HONOR ROLL

Associate Professor of History **Jorell Meléndez-Badillo** and Assistant Professor of Gender & Women's Studies **Aurora Santiago Ortiz** received a Mellon Foundation Presidential Initiative grant to create the Puerto Rican Studies Hub, a center focused on research about the island territory.

Professor of Art History **Anna Andrzejewski** is the inaugural recipient of the Frank Lloyd Wright Professorship of Modern American Architecture. The new position, funded by alumnus Dan Erdman ('80, Exec MBA'99), is designed to engage students and the public with the famed architect's work and the social issues—such as affordable housing and sustainability—that motivated him.

**Jonathan Renshon**, the Department of Political Science Board of Visitors Professor, has been awarded a 2025 Karl Deutsch Award from the International Studies Association (ISA). The award honors international relations scholars under the age of 45. Renshon's work concentrates on the role of status in international relations and its connection to commitment bias.

## Another Genius

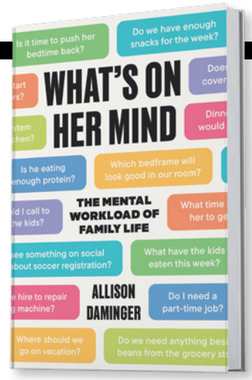
Seriously, is it something in the water? For the third time in six years, a faculty member in the College of Letters & Science has been awarded a MacArthur Fellowship by the John D. & Catherine T. MacArthur Foundation, colloquially known as a "Genius Grant." Ángel F. Adames Corraliza, the Ned P. Smith Distinguished Chair of Climatology and associate professor of atmospheric and oceanic sciences, will receive an $800,000 stipend with no conditions. Adames Corraliza's research focuses on quantifying the role of moisture in tropical weather and climate—an understudied area of atmospheric research.

"The tropics receive so much more sunlight than the rest of Earth," he says. "They have an excess of energy that they donate to the mid-latitudes, and the way they export that energy is through clouds—convection and big systems that rain a lot, like thunderstorms and hurricanes."

Adames Corraliza, who hails from Puerto Rico, is also a big believer in scientific outreach. He developed "Tiempo, Clima y Tierra," a Spanish-language podcast that educates a wide global audience on tropical weather and climate issues.

PHOTO: JOHN D. & CATHERINE T. MACARTHUR FOUNDATION

Ángel F. Adames Corraliza's research has brought more accurate weather forecasting to the tropics.




## Balancing the Scales

Women typically spend twice as much time on housework and childcare as their male counterparts. But that doesn't account for an even bigger imbalance in what's know as cognitive labor, which is the daily planning, decision-making and management of family life. That imbalance is the subject of Assistant Professor of Sociology Allison Daminger's new book, *What's on Her Mind: The Mental Workload of Family Life*.

Daminger interviewed a wide range of couples to determine who handled the bulk of these under-the-radar efforts that Daminger refers to as "project management for the household." Her results showed that women tend to do most of the heavy lifting.

Daminger's book also explores the reasons behind the imbalance. She discovered that in many cases, couples were coming up with explanations that sounded more reasonable than falling back on traditional gender roles—for instance, "He works longer hours and can't do more" and "She's just naturally more organized." Her book debunks these myths and suggests ways out of the problematic pattern.

## Page Turners

Most book clubs don't make it to their 100th read, but this bookish bunch isn't like most book clubs. They have a formal constitution outlining guidelines, a spreadsheet tracking each book they've read and a group chat that pings daily. Plus, the group is made up largely of L&S alumni (and one extra), who were inspired by their degrees to continue the lifelong pursuit of learning.

"Having the book club gives us an opportunity to hear each other analyze issues in ways that would not be part of our conversation otherwise," says Ken Wiseman ('71), who has been with the book club since the beginning when they launched in 2020. He is joined by his friends David Tabacoff ('71), Steve Glauber ('60), Howard Klein ('72), Joel Cohn ('72), Gary Kagan ('72) and Richard Appel ('72).

The group cites inspiring professors such as Harvey Goldberg, George L. Mosse and William Appleman Williams for nurturing their love of learning. In fact, most of the books they pick are nonfiction. Early next year, they'll turn the page on their 100th book, but they won't stop there.

Want to know more about how they make this work? Read more at **go.wisc.edu/lsbookclub**.

MORE L&S NEWS AT **LS.WISC.EDU/NEWS**

# Penny for Her Thoughts

Liz Dennett is tackling the copper crisis using nature's oldest miners: microbes.

BY ALLI WATTERS

What is society's biggest impending threat? It's a question that sparked a lively debate for Liz Dennett (MS'10, PhD'14) and her friends in a Scottish pub.

"I thought it was going to be freshwater, because I know how many gallons of it go into my phone," says Dennett, who received her master's and doctoral degrees in geoscience. But one of the researchers she was with was confident he knew the real answer. He told her, "Actually, it's going to be copper."

PHOTOS: LEA GOLIS

He explained that the lack of access to copper is on track to becoming a civilization-level bottleneck. It's needed for electrical wiring, plumbing, construction, cars, machinery and, yes, even phones. Artificial intelligence has exacerbated this, with each individual AI data center requiring 10 to 15 tons of copper. Between now and 2050, society will use more copper than in all human history—but copper is a non-renewable resource and the ways of acquiring more are typically environmentally disastrous because they intrude on the sea floor or areas of the earth that shouldn't have mines.

Oddly enough, the problem didn't seem insurmountable to Dennett—she had ideas for solutions. Her first draft was admittedly a bit rudimentary. She figured that if there was ever a copper crisis, the United States could just recycle pennies. But that was quickly shut down, when she learned that modern pennies don't actually have any copper in them. Then the problem-solving skills she picked up through years of education and research at UW-Madison kicked in.

"Why don't we just take microbes, engineer them, spread them on heap leaches, couple them with cloud computing and bing, bang, boom, Bob's your uncle," says Dennett, using scientific terms to explain how harnessing microbial communities can make the most of the copper resources that already exist without the need for more new mines. The same scientist who proposed the problem gave an answer that would become a catalyst for Dennett to become the founder and CEO of Endolith, a company creating the biotechnology needed to make mining more sustainable and effective: "I don't know, Liz, why don't you?"

Laughing, Dennett says she hasn't slept well since.

Yet, founding a company was never on her bucket list. Before becoming an environmental entrepreneur, Dennett was a kid growing up in small-town Alaska with her nose in science fiction novels like *Jurassic Park*. Books inspired her to study geology when she went for her undergraduate degree at the University of Alaska Anchorage, eventually carving out a specialty in astrobiology. UW-Madison's connections with NASA caught her attention and, after touring several schools, she chose Wisconsin to complete her education.

"I was concerned about feeling like a fish out of water," says Dennett, who was the first person from her high school to earn a PhD. "But there was something about the Wisconsin Idea and how people approached every aspect of it. From being warm, friendly and inclusive to the quality of research without ego and the depth of expertise within the department, I just felt like I was at home immediately. To this day, I've never felt anything like it."

While on campus, Dennett was committed to making the most of every opportunity presented to her. She taught spin classes to the swim team, competed in triathlons, became an officer in the geoscience club and took science journalism classes despite not needing them for her degree. She even co-taught an astrobiology class with Mary C. Jacoby Professor of Astronomy Eric M. Wilcots before he became the Dean of the College of Letters & Science and a lifelong friend.

The place on campus that most stole her heart was the Geology Museum. If you visit there today, you'll find an astrobiology exhibit that she helped produce when she volunteered there as a student. Even as an alumna living out of state, she still has managed to have an impact, most recently as the lead donor helping the collection acquire a meteorite that was found in the Town of Vienna, Wisconsin. The museum is a must-stop when she returns to campus at least twice a year.

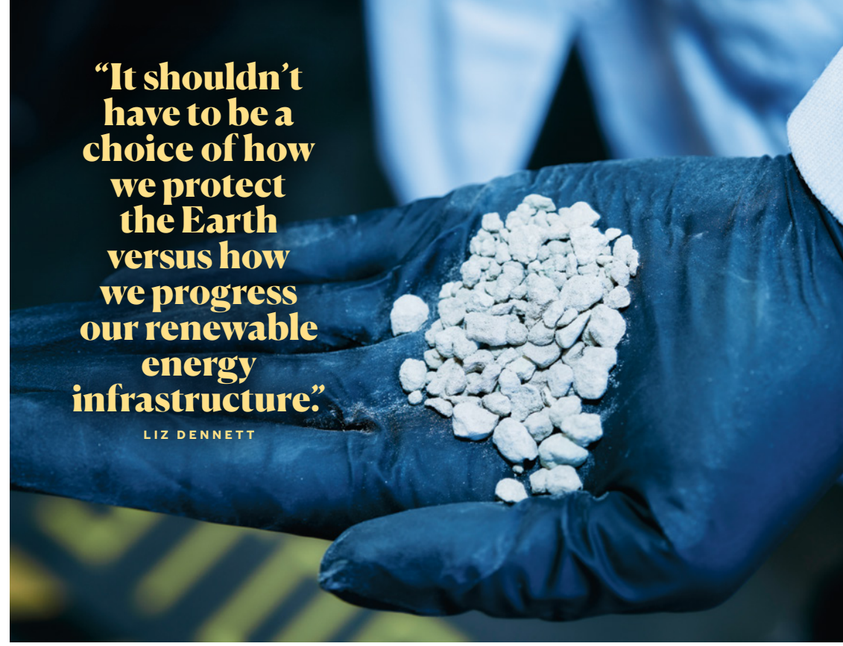
"My time in Madison was an absolutely foundational element that has enabled every single thing that I do now," Dennett says. "It manifests in how I communicate about the science, how I think through inventing our way through challenges and even the gratitude I have for the opportunities that come my way."

She draws on these skills often as a CEO and researcher. There's no road map for the work she and her team at Endolith are doing, and most startups in the mining industry are unsuccessful. But they have something other ventures don't: technology that works. Endolith's microbes significantly increase recovery of a variety of ore types. Dennett believes they could close the copper gap between now and 2050.

"People said it was impossible, and it was crazy," Dennett says. "But if people don't think you're crazy and you're not uncomfortable, you're not pushing the limits far enough."

With early success stories and happy customers, Endolith is getting ready to head into the field and start large-scale commercial deployments. And while they're starting with copper, this technology can be applied to other critical minerals, which could help secure supply chains and support the world's clean energy goals.

"It shouldn't have to be a choice of how we protect the Earth versus how we progress our renewable energy infrastructure," Dennett says. "We should be able to do both, and we're leveraging microbes to do that." ■




Liz Dennett was honored this year by the Wisconsin Alumni Association with the Forward Award. It celebrates rising stars who exemplify the Wisconsin Idea through an emphasis on service, discovery and progress.

PHOTO: PAULIUS MUSTEIKIS

# A Sound Investment

Through an innovative new partnership, two Madison philanthropists support a cause dear to their hearts.

**BY KATIE VAUGHN**

When Lau and Bea Christensen joined fellow donors on stage to celebrate the opening of the Hamel Music Center in the fall of 2019, he gave a toast and she followed with an a cappella performance of "Feeling Good."

It was a fitting moment for the couple, who are not only generous philanthropists in Madison but also longtime musicians. Their most recent gift to the College of Letters & Science continues their passion for giving by providing exciting new opportunities for deserving students to pursue their futures in music.

### Finding Their Rhythm

Growing up in Green Bay, Lau heard a lot about UW–Madison because both of his parents and three older siblings were Badgers. Lau eventually followed their path to campus — not as a student, but as a professor in the Department of Economics — after earning an undergraduate degree from Cornell University and a PhD from the University of California, Berkeley.

Lau served on the UW–Madison economics faculty for 20 years, from 1967 to 1987. Toward the end of his tenure, he co-founded the economics and engineering consulting firm Christensen Associates, where he continues to serve on the board of directors.

Bea, widely known as "Bea from Cherokee," wrote and recorded radio commercials in the Madison area for many years. Bea and Lau met in the Madison New Horizons Band, in which they still perform, Bea as bass clarinetist and vocalist, Lau as trombonist. They married in 2009, and today their blended family boasts eight children, 20 grandchildren and 21 great-grandchildren.

For years, Lau had been involved in local philanthropy, including within the economics department, where he established the Christensen Award to encourage collaboration between graduate students and faculty, endowed a named chair, and has served on the board of advisors since its inception.

Since becoming a couple, Bea and Lau have supported numerous organizations and causes making a difference, including the Mead Witter School of Music's board of advisors.

"We met through music, and music has been a big part of our life together," says Bea.

"One of the earliest things we did was make a gift to the Hamel Music Center," Lau adds. "It was a pleasure to see that develop."

### A Harmonious Pairing

The Christensens have also supported a variety of scholarships within the Mead Witter School of Music over the years, but they still wanted to do more to help. With guidance from the Wisconsin Foundation and Alumni Association, they recently created the Music Education and Center for Academic Excellence Partnership gift.

This new partnership between the Mead Witter School of Music and the Center for Academic Excellence (CAE) — a nearly-60-year-old program that provides community and academic support to a select group of incoming L&S students each fall — increases access to music education for undergraduate students with a particular focus on those who are first in their family to attend college or who come from low-income or rural backgrounds.

"There are so many young people with talent who want to pursue their education," says Bea. "But many are not able to use that talent due to financial situations."

The Christensens' gift will support four cohorts of three to five students from freshman year through graduation over a total period of seven years. This summer, the program welcomed its first three students: flutist Autumn Heffernan and trumpeters William Johnson and John Roche.

While CAE has partnered with departments from STEM fields in the past, this collaboration with the Mead Witter School of Music is the first of its kind. The partnership is already catching the attention of music educators from peer institutions, and the Christensens hope it will inspire other donors to support such innovative and impactful projects.

For now, though, they're eager to see where their support takes the first cohort of musicians and are proud to continue giving in all the ways they can.

"Philanthropy continues to be a very important and satisfying part of our lives," Lau says.

"We share a lot of what we have with those in need, which makes us feel very good," adds Bea. ■

## Full Circle Support

In addition to giving generously across the College of Letters & Science, Lau and Bea Christensen are among the founding members of the new Dean's Circle Giving Society.

This prestigious society recognizes donors who give a total of $1,000 or more each year to priority funds within the College, while recent graduates have the opportunity to join at smaller contribution amounts.

Support from Dean's Circle members gives L&S leadership the flexibility to meet the needs of the College as they arise, making an immediate impact on students, faculty and staff. Gifts also allow the College to expand student research opportunities, career services, scholarship support and other high-impact programs such as the L&S Honors Program and the Center for Academic Excellence.

**For more information on the Dean's Circle Giving Society, visit go.wisc.edu/LSDeansCircle.**

# With Bated Breath

BY STACEY D. SMITH

When we arrived at the emergency room, my five-year-old son was struggling to breathe. Doctors and nurses jumped into action with swabs, IV liquids and X-rays. Immediately, they administered nebulized racemic epinephrine (NRE), which is the first-line treatment for difficulty breathing. The NRE bought us time while we waited for test results, which revealed a severe strep infection, treatable with antibiotics. Despite the stress and fear that day, I was grateful for the medical professionals who knew what to do. But why did they know what to do? The answer involves more than a century of scientific advancement, not just in medicine but in all the related fields that led to NRE—the medication needed to open my son's airways.

Stacey D. Smith (PhD'06) studied botany at UW–Madison. Today, she is an associate professor at the University of Colorado Boulder, where she researches wild members of the tomato family.

For thousands of years, people have known that naturally occurring compounds can help with difficulty breathing, like ephedrine produced by the plant *Ephedra*. George Oliver and Edward Schafer made a breakthrough in the 1890s when they demonstrated that adrenal gland extract could alter heart rate and blood pressure. Soon after, chemists set out to purify the compound responsible for this effect. Two labs (those of John Abel and of Jōkichi Takamine) succeeded almost simultaneously, and in 1901, Takamine and his technician Keizō Uenaka patented adrenaline, opening the door for future research. Initially, the drug was given as an injection, but in 1910 physiologists George Barger and Henry Dale proved that inhaling epinephrine is more immediately effective. This is when epinephrine became widely used as a bronchodilator—the same way it was used for my son.

The research didn't stop there. By the 1940s, teams of physicians were carrying out large clinical studies comparing the effects of racemic epinephrine to other formulations. Cardiologist James Alexander and pulmonologist Maurice Segal confirmed that when delivered through a nebulizer, the racemic mixture was fast-acting and long-lasting with few side effects, making it the go-to treatment for adult patients with difficulty breathing. The use of NRE in children began in the Mountain West in the 1960s where, due to the thin air, children with difficulty breathing are at higher risk.

So, here's my kid, 60 years later, coming into the ER with a constricted airway, and he is quickly met by a respiratory therapist who calmly administers NRE, confident it will help. And I can take a deep breath, too. We owe this confidence to generations of scientists who pushed the boundaries of knowledge, not knowing if their efforts would make a difference. Oliver and Schafer didn't experiment with adrenal extracts to save my son but because they thought the world should know what adrenal glands do. Because of them, Takamine was driven to find and patent the active compound, in turn allowing researchers at universities across the country to test its effectiveness. And behind all these advances are societies that value and invest in science of all kinds.

As a researcher myself, I'm scared that science as we have known it is coming to a screeching halt. Decades of investment in basic research, including in the people and places where science happens in our country, are being defunded by the federal government with complete disregard for the consequences. This is not the future I want for my kids. I want to tell them that they can go to a university where students are free to learn about anything and can do it alongside scholars who've dedicated their lives to learning. I want to tell them that people are working hard on cures for cancer and that one day we are going to get there. For that to happen, more people must understand that basic science matters. I hope that's you. ■

ILLUSTRATION: PAIGE VICKERS

College of Letters & Science
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# Last Word

This year, the University of Wisconsin–Madison welcomed 8,500 new freshmen to campus, representing every county in the state of Wisconsin. The students also hail from 50 U.S. states, the District of Columbia, Puerto Rico and 51 nations around the globe. As part of the welcome festivities, thousands of new students gathered at Camp Randall to be a part of the W Project, grouping together to form the iconic Motion W made up of new Badgers. After the photo op, the new Badgers stuck around for music from the University of Wisconsin Marching Band and a drone show that featured quintessential campus imagery like Bucky Badger, the Bascom Hill flamingos and the lyrics to "Varsity."

PHOTO: TAYLOR WOLFRAM