UNIVERSITY OF WISCONSIN-MADISON COLLEGE OF LETTERS & SCIENCE RESTORTED TO THE SCIENCE RESTORTED

THE WISCONSIN IDEA MADE AUDIBLE page 18



The ceiling of the Mead Witter Foundation Concert Hall in the new Hamel Music Center.

Contents

FEATURES

02 Letters from Readers

DEPARTMENTS

- 03 From the Dean
- 04 Here & Now
- 06 Asked & Answered A philosophy graduate student investigates impostor syndrome to find out whether it's rational to feel like a fraud.

08 Explore & Discover

LEADERSHIP	'In Our Best
	Moments, a
	Magical Place'
RESEARCH	Small Wonders
TEACHING	Learning through Teaching
FACULTY	More than Protest
STUDENT	Study a language? <i>Sí. Ja. Oui.</i>
CULTURE	Textual Relations

- 17 News & Notes
- 34 Give & Transform

His surname is already synonymous with science on campus, but Wayland Evan Noland is ensuring that scientific pursuit remains strong into the future.

36Sift & Winnow

A botanist reflects on the quest to discover how the remarkable diversity of lifeforms on our planet came to be.



The new Hamel Music Center enlivens the Madison music scene and offers a sparkling performance venue for students, faculty and visiting artists. The future looks bright for the Mead Witter School of Music, where the work has always been about collaboration and the joy of connecting with others. **BY MARY ELLEN GABRIEL**

24 Knowledge On Display

Ever since the Board of Regents called for a "cabinet of natural history" to showcase the state's plants, animals and minerals, museums and special collections have made incredible resources available to researchers, students and the public. BY KATIE VAUGHN



Young visitors admire the Newton's Cradle at the Physics Museum.

PHOTO: BRYCE RICHTER

50 Focus Forward

Over the last 52 years, the UW Institute for Research on Poverty has positioned itself as the go-to resource for policy-makers at the state and federal level. Even after all this time, IRP is finding ways to continue looking forward. BY AARON R. CONKLIN

LETTERS FROM READERS

We asked readers to share memories of L&S professors. These tributes say it all:

Professor Robert Haveman was my undergraduate thesis advisor during my last year in Madison. I fondly remember regularly meeting with Bob in his office in LaFollette, an office with a sloped ceiling and neat piles of papers along the floor, all marked with different project names.

Bob introduced me to the world of conducting research in economics, helping me learn how to read journal articles, understand practical statistics and econometrics, seek hard-to-find data and how to write with the reader in mind. He would guide me to think carefully about the issues we were investigating.

Always with a smile on his face, Bob showed me how to enjoy the work of an economist. Throughout my graduate work and long into my professional career, Bob was a regular source for guidance and suggestions.

I graduated from Wisconsin 20 years ago. Today, I work as an economist at the Urban Institute, a nonprofit research institution based in Washington, DC, and I try to emulate Bob's positive demeanor and passion for the field, as well as help young scholars on their paths forward.

JONATHAN A. SCHWABISH, BA'98



Professor Albert R. Erwin, Jr. was my first physics professor, as well as my boss when I was an undergraduate hourly and my PhD advisor. His gentle demeanor, keen intellect and dry sense of humor all worked together to make physics memorable. He approached everything with a sense of awe; it was like he was a kid in his physics sandbox. That rubbed off on me.

I am in my 21st year of teaching college physics and trying to inspire the next generation of (female!) physicists the way Albert did, and absolutely loving it. I tell my students, "If nothing else, walk away with a sense of awe at how our universe works, and never stop being curious!" Albert passed in 2011, but he lives on through those whom he inspired. I hope I've made you proud, Albert! CASEY DURANDET, BS '89, MS '91, PhD'95

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2

Big Ideas



I arrived at UW-Madison 24 years ago from a postdoctoral position at the National Radio Astronomy Observatory. I was excited to dive into a research career exploring the evolution of galaxies, and was eager to get back to teaching. I knew that here at UW-Madison, groundbreaking discovery and the creation of new knowledge exist side-by-side with great teaching. I knew I would be working with absolutely fantastic undergraduate and graduate students. I was drawn by this university's deep commitment to international engagement, community-building and service. It is that combination that has allowed me to teach introductory courses on "Life in the Universe," work with international colleagues on the Southern African Large Telescope and bring astronomy to the public through our "Universe in the Park" program. UW draws people hungry for this kind of exchange, which creates a rich and fertile environment for teaching, learning and new ideas.

Here at UW, our work, discoveries and teaching are all grounded in the Wisconsin Idea. This is the notion, set forth in 1905 by UW President Charles Van Hise, that the beneficent influence of the university should reach every family of the state. That philosophy keeps us grounded and connected to one another, to our students and to the people of Wisconsin. It is an unrivaled idea that has proven both durable and inspiring, practical and transformational. It has deeply informed my work, as it has for my colleagues.

In this issue of *Letters & Science*, we celebrate our commitment to the Wisconsin Idea. The new Hamel Music Center will not only draw performers and audiences to Madison, but also stream concerts out into the world. The Institute for Research on Poverty, celebrating more than 50 years as the nation's leading nonpartisan poverty research center (and recently designated the sole National Poverty Center in the country by the federal government), is impacting policies and programs to combat poverty, inequality and their effects in the U.S. And our story on L&S museums and collections peers into repositories of rare and fantastic items that draw a wide array of visitors, from scholars to schoolchildren.

We also share with you a retrospective on our new provost and former dean, Karl Scholz. It has truly been an honor to serve with Karl over the past six years. I hope you will join me in congratulating him on his new position, and thanking him for his tremendous leadership that has transformed the College of Letters & Science in so many ways.

As I assume my role as interim dean of the College of Letters & Science, I am reminded of what drew me here in the first place: research excellence, the chance to teach and mentor great students, the lively interchange of ideas and the opportunity to share research and knowledge for the betterment of all. I could not be prouder of the immense role this College plays in the fulfillment of the Wisconsin Idea.

Thank you for all you do to help make L&S extraordinary.

On, Wisconsin!

Eric M. Wilcots

Interim Dean and Mary C. Jacoby Professor of Astronomy, College of Letters & Science



Charles Booth's "The Inner West [of London] (1900)," from vol. 3 of his *Life and Labour of the People in London* (London: MacMillan and Co., 1902), is a detailed map of the economic status of Londoners, house by house from poor (black and blue) through middling (purple) to wealthy (red and yellow).

Navigating History

Maps don't just tell us where we are — they help show us who we are. That's why UW-Madison's History of Cartography Project explores the history of mapping from prehistoric times to the 20th century, offering insights into how and why people make and use maps, and what maps reveal about the societies that create them.

The project's signature achievement is the *History of Cartography* series, which brings together scholars in arts, humanities and sciences to analyze maps from a wide range of time periods and cultures. Volume 4, on cartography in the European Enlightenment, will be published late this year, and the following volume, focusing on cartography in the 19th century, is forthcoming, thanks to funding from the National Endowment for the Humanities. The federal agency has continuously supported History of Cartography since its start in 1981, calling the project "one of the most sweeping academic undertakings of a generation." "It's important to be entertaining the crowd, always. But I also want to provide the students in the band with a great experience."

COREY POMPEY, the new UW Marching Band director

It's been a full five decades since the Mead Witter School of Music has selected a new leader of the UW Marching Band. But after an extensive national search, they've found one: Corey Pompey.

Pompey, who came to Madison from the University of Nevada, Reno, took the baton from legendary UW bandleader Michael Leckrone as the new director of athletic bands and associate director of bands.

"He has a deep musicianship along with an enthusiasm and energy on the podium that is infectious," says School of Music director Susan Cook. "He really connects with the students."

Creating a Pipeline

The Department of Chemistry and the American Chemical Society are partnering to train more underrepresented minority students in chemical research.

Starting this semester, the ACS Bridge Program brings to campus aspiring scientists who previously experienced limited course or research opportunities. In just 21 months, students hone their research and writing skills, take classes, present at a national ACS meeting and earn a research master's degree. And as they complete their first year of bridge requirements, they apply for admission into a chemistry doctoral program.

"This will create a new pipeline through which students can enter

graduate school," says computational chemistry leader Desiree Bates.

PHOTO: AARON R. CONKLIN

Chemistry professor Robert Hamers, who was instrumental in bringing the bridge program to UW-Madison, says the benefit of this effort is in adding to the pool of diverse applicants, rather than redistributing those already in the field. He believes the key to the program's success lies in the dedication and excitement that faculty and current graduate students have shown, particularly in regard to serving as mentors.

"I knew this was going to work when faculty and students packed the room to discuss the program," Hamers says. "The room was full of energy. The faculty and graduate students are ready to mentor the new bridge students."





Buoyed by Support

When Jake Vander Zanden, who directs the Center for Limnology, finally accepted the fact that the Center's trusty 52-year-old boat, the Limnos, was overdue for retirement, he knew a replacement had to be found. The Limnos had been used primarily for teaching and outreach. The next boat needed to perform a research function, as well. But boats are expensive, so Vander Zanden and Center staff planned to scout for a secondhand pontoon boat that wouldn't break their budget.

But then Day of the Badger happened. Funds raised from generous alumni and supporters during the university-wide annual day of giving on April 9, along with the funds from the Center's endowment, enabled the College of Letters & Science to assist the Center in purchasing a shiny new pontoon boat. In addition to outreach and teaching, the Limnos II will be used for a variety of research projects ranging from water quality sampling to fish population studies.

"Every student who takes a limnology class should have the chance to get out on the lake for hands-on learning," says Vander Zanden.

With their generous support, loyal Badgers proved, beyond a doubt, that a rising tide truly lifts all boats.

Asked&Answered

2



Is it rational to feel like an impostor?

BY KATIE VAUGHN

ou're giving a presentation. All eyes are on you as you begin sharing knowledge about a topic you've spent years building expertise on, but your brain is sending a troubling message: Why would anyone listen to you? Everyone can see you're not qualified.

Impostor syndrome — the phenomenon of feeling like a fraud and that your accomplishments aren't your own — affects even the most successful people. Athletes, musicians, CEOs and other high achievers can fall victim to it, doubting that they have played a starring role in their own accomplishments or deserve to be in a place of achievement, even as wins and accolades accumulate.

The common advice to combat impostor syndrome is to dismiss the doubts as irrational, believe in yourself and forge ahead. But Shanna Slank, a philosophy graduate student who earned her PhD this summer, suggests the "impostors" might actually be rational for feeling the way they do.

"If you're thinking about all of the causes of your success, you can rationally decrease your confidence in thinking you are the reason for it," she says.

After all, a whole smattering of criteria can lead to success, from parents who could afford to pay for your test prep or allow you to take an unpaid internship to advance your career path, to a stroke of good luck such as being in the office on a day when your boss was ready to hand out a great opportunity.

People who consider those factors end up with a more realistic and reasonable assessment of how they've gotten to where they are – their talent was part, but not all, of it.

"I do think they can be attributing things correctly and giving themselves the right credit," Slank says. "The people who are not so confident are the ones being more rational."

Slank, a moral philosopher interested in topics such as the nature of right and wrong, says her interest in impostor syndrome started out "a bit autobiographical." Even she identified with the phenomenon.

But Slank hopes her work pulls back the curtain to show that everyone has a mix of reasons that lead to achievements and that acknowledging them doesn't make you any less worthy of your success.

"If you can think of attending to all of your causes for success as rational, you might not feel as bad," she says. ■

Explore&Discover



'In Our Best Moments, a Magical Place.'

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After a successful tenure, Karl Scholz moves on — and up. BY AARON R. CONKLIN **fter six years at the helm** of the College of Letters & Science, Karl Scholz announced in May that he would be leaving his position as dean of the college to move a little farther up Bascom Hill. In early August, Scholz assumed the role of provost, the university's chief academic officer.

By any account, it has been an impressive run for the Nebraska native, who's been part of the UW-Madison faculty since 1988. When Scholz succeeded Gary Sandefur as dean in 2013, the college, and UW-Madison, were facing budget cuts and an uncertain economy.

"It felt like a little more challenging time for the arts and sciences colleges," Scholz recalls. "But I was fortunate to inherit a college that was fundamentally in good shape. We have fantastic staff and faculty." One of Scholz's most impressive accomplishments as dean was the creation of SuccessWorks, a wide ranging undergraduate career initiative focused on helping students articulate and leverage the unique strengths of a Letters & Science education. Last year alone, SuccessWorks, which receives 50 percent of its funding from donors, served 10,000 students in 15,500 interactions, connecting them to a vast pool of engaged alumni and employers to prepare them for professional success after graduation. Other Big Ten schools, and institutions around the world, have studied and borrowed from the SuccessWorks career development model.

"Karl identified a critical issue in higher education and addressed it head-on: How do we support students' career development at a time when liberal arts education is being challenged? Not only were we able to develop a

"I believe an education that has depth but also has breadth is a fundamentally good idea."

KARL SCHOLZ, Provost, University of Wisconsin–Madison

high-quality program that is making a big difference in students' lives, but Karl leveraged this opportunity to highlight and celebrate the world-class education we provide in L&S," says Rebekah Paré, SuccessWorks' executive director. "As a result of Karl's vision, this initiative has fundamentally changed the college for the better."

Under Scholz's watch, the college grew its revenue streams (particularly through a revitalized Summer Term) and enhanced budget transparency among its various units. Scholz also launched Fueling Discovery, an annual partnership with the *Wisconsin State Journal* designed to highlight faculty and important research in the college.

Fundraising also soared under Scholz. The college is more than 90 percent of the way to meeting its \$508 million goal as part of the university's All Ways Forward comprehensive campaign.

"Karl has been an amazing fundraiser for the college, and that was not a surprise to me," says Mike Knetter, president and CEO of the UW Foundation. "Karl exudes the qualities that facilitate success in development work. He grasps the opportunities to make a difference, is a terrific communicator, is trustworthy and works as hard as anyone I know."

Scholz has been a passionate defender of the liberal arts, as anyone who has heard him speak can attest. It's one of the core narratives he deploys wherever he goes, and he never hesitates to use it to advance the Letters & Science mission.

"I want students and their parents to confidently engage with whatever they're excited about," says Scholz, who received his undergraduate degree from Carleton College in Minnesota and his PhD from Stanford University. "I don't want them to have the fear that they can't major in 'X' because it's a path to nowhere. Very wise people across the centuries as well as today appreciate the liberal arts and that being exposed to different ways of thinking and drawing connections is a wonderful foundation. I believe an education that has depth but also has breadth is a fundamentally good idea."

Scholz's six-year tenure has yielded no shortage of happy moments and memories, but he finds they share some common threads — all involve direct interaction with students and alumni.

"I cherish the interactions with students around graduation, because they're so happy, yet there's a melancholy that they're leaving this place," he notes. "To me, it reinforces this idea that we are a fundamentally interesting institution that's doing something important. There's a different dose of the same vibe in settings with alumni. I think the college is, in our best moments, a magical place."

As provost, Scholz meets regularly with interim dean Eric Wilcots, who is leading the College of Letters & Science while the university conducts a national search for a permanent replacement. Given that the college teaches roughly 65 percent of all undergraduate credit hours at UW-Madison, it's a safe bet that Scholz will remain heavily involved with the college's academic mission.

"I love what I do," Scholz says. "I have been consistently inspired by the accomplishments of staff and faculty and have loved the opportunity to learn of, support and help tell their stories. I believe deeply in our mission to expand the boundaries of knowledge and understanding, and to prepare students to make a good living and lead a good life. I'm excited to see the future of Letters & Science."

Karl Scholz with Dan Kelly of American Family Insurance, Chancellor Rebecca Blank and Rebekah Paré at the grand opening of SuccessWorks in 2018.

PHOTOS: SARAH MORTON





small Wonders

Finding big potential in the nano-verse. BY AARON R. CONKLIN een under a powerful microscope, they resemble luminous blue sugar crystals, the kind of thing you might sprinkle on a cookie or a bowl of cereal. But if a farmer were to apply them to a field of corn, the plants could better ward off fungal diseases.

They're thousands of copper phosphate flakes, an example of an extremely useful nanoparticle compound the Center for Sustainable Nanotechnology helped develop and refine. Researchers affiliated with the center, a virtual hub directed by professor of chemistry Robert Hamers, have been working for

nearly a decade to understand the behavior and potential beneficial impact of nanoparticles. What began as a regional center with five researchers has since expanded to 15 senior investigators and hundreds of students, located at 12 institutions in the Midwest and, now, across the country.

Broadly speaking, nanotechnology is the science of small things — more specifically, understanding the unique properties of solid materials that occur when they're extremely small (think 100 nanometers or less). In this case, smaller size means greater numbers and more surface area — and more room for chemical reactions to occur. Critical technologies like lithium–ion cell phone batteries are made significantly more efficient through nanoparticles.

Hamers first got involved in nanotechnology in 1985, when he created one of the world's first functional scanning tunneling microscopes, a tool that allowed scientists to see the discrete structures and imperfections of atoms.

"Once you see things, you begin to control things," says Hamers. "Once you can control things, you can make things. This opens up a million things you can do."

Over the last few years, Hamers and his colleagues have focused on a pair of promising research paths: Understanding the environmental impact of chemically sustainable metal oxides (aluminum and iron) that can serve as replacements for the far less efficient materials (like cobalt) that currently power modern tech, and nano-agriculture, the use of nanomaterials to improve crop outcomes.

"By controlling the composition and size and shape of nanomaterials, we can do a lot to improve the world of agriculture," says Hamers, noting that up to 25 percent of the world's food supply is lost to plant diseases. "There's a huge potential economic impact."

Other research paths beckon, including using unique quantum properties of nanoparticles as a way to to achieve new types of sensing and chemical detection.

"We have gone from the ability to observe these materials to the ability to understand and predict what they can do. As a scientist, that's really satisfying." ■

They may look like sugar sprinkles, but these nanoparticles can make an enormous difference in agricultural crop outcomes.



Learning Through Teaching

For Kristin Shutts, teaching is a real learning experience. At the end of every large lecture, the professor of psychology asks students to turn in response cards. She wants to know what was interesting and what was a little less so. What do they want to know more about? What questions do they have? This is knowledge only her students can provide. Shutts, winner of a 2019 William H. Kiekhofer Distinguished Teaching Award, has figured out how to establish strong connections with students, no matter the class size. BY KÄRI KNUTSON

started collecting response cards because I thought it would be a good way to learn what students didn't understand from my lectures. But what turned out to be the more interesting result, and what started changing my teaching, was that students tended to use the cards to say what they were most interested in and what they wanted to know more about. That's something as an instructor that can be hard to gauge. To have real feedback every lecture about which things actually spoke to students is incredibly valuable.

I know how meaningful it can be to get to know a faculty member who cares about what you're interested in and what your goals are. It's important to have someone who is willing to put the time in to understand where you've been and where you're going.

I went to Simon's Rock College in western Massachusetts. There were just a few hundred undergraduate students. Class sizes were very small. We called professors by their first names and sat with them at lunch. That had a huge influence on how I thought about teaching and what connections between students and teachers could look like. The challenge – or you could think of it as an opportunity – is how to do that in larger classes.

My first class teaching was as a teaching assistant for introduction to psychology. I wrote out everything I wanted to say and said it in a very short period of time. I ended by saying, 'I'm sure that was pretty clear. There are no questions, right?' And I just left. It can be scary in that space, asking if people have questions, letting students move a class forward. What if they have questions and you don't have the answers? What if the discussion goes in a direction you aren't prepared for it to go? At the time, it seemed better to just leave before anything could go wrong.

l've learned to just admit to students when I don't know something. I wouldn't have been able to do that as a young teacher. It takes practice and figuring out how to have humility and admit you're trying something out. I've also learned to be reflective. I take notes after class about what went well and what didn't go so well and if I have ideas at the time about what I could do next time.

Most of the time students are very generous and forgiving in the classroom. If you are open about your goals and intentions, they can appreciate you're trying to do something that, for them, is new, and that came from a thoughtful place. They'll go on that journey with you. As an instructor, you just have to give up on that idea that it's always going to be perfect. ■

More than Protest

Political scientist Erica Simmons reveals that threats to people's sense of identity are often what drive protest movements that change the course of politics around the world and here in Wisconsin. t the center of the Mayan creation story is the teaching that human beings were fashioned by the gods from corn. Corn holds significance for the Aztecs, too, who dedicated festivals and rituals to this all-important grain. First cultivated in Mexico around 10,000 years ago, corn holds a very special place not only in Mexican cuisine, but in Mexican culture.

So when U.S. corn flooded Mexico's marketplace under the North American Free Trade Agreement, the idea of corn as an import prompted massive demonstrations. Tens of thousands of Mexicans marched in the streets of Mexico City in 2007 under the banner "sin maiz no hay pais" (without corn, there is no country).

The uprising wasn't triggered by pure economic necessity. Rather, says political scientist Erica Simmons, who studies social movements in Latin

America, it was triggered by a threat to people's sense of who they are. With more and more corn coming from outside Mexico and prices reaching unprecedented levels, many Mexicans felt they were losing a critical piece of their identity.

"It matters enormously in Mexico – the idea that Mexicans are producing less and less of the corn they consume," she says.

Simmons' work uncovers the deeper meaning of protest movements that center around subsistence goods with powerful cultural significance. Along with street demonstrations against rising corn prices in Mexico, she has studied water privatization in Bolivia. In both places, market forces threatened people's access to a specific good that they saw as central to their culture.

In researching her book, *Meaningful Resistance: Market Reforms and the Roots of Social Protest in Latin America*, Simmons went door to door in Mexico and talked to strangers about the connections they felt between corn and their own "Mexicanness."

"Even in Mexico City, there is a narrative about the Mexican countryside that continues to exist around corn that is very powerful," Simmons explains. "You still have the ideal of the Mexican grandmother who hand-grinds the corn and makes tortillas."

Simmons points out that the Mexican government was quick to grasp the significance of the issue, and responded by making a pact to cap the price of corn in government-run stores. That satisfied the protesters enough that the demonstrations stopped within a month.

But there were no universal price controls, and the price of corn continued to rise even as the protests waned. Simmons found that the key to resolving the issue was not so much the material matter of corn prices as it was the govern-ment's acknowledgement of the importance of corn in Mexicans' daily lives.

"The state effectively communicated, 'We care about this issue, and we're looking out for you,'" Simmons says.

In Bolivia, by contrast, the federal government failed to take seriously the concerns of protesters who kicked off what came to be known as the Cochabamba Water War in April 1999. Political science associate professor

PHOTO: LUIS ACOSTA / GETTY



The public uprising over a privatization plan that dramatically increased water rates led to violent clashes with police between 1999 and 2000. Finally, after months of protest, during which tens of thousands of marchers fought with police and one protester died, the national government reached an agreement with community activists to reverse water privatization.

Part of the reason for the different ways in which these conflicts unfolded, Simmons says, is that federal government officials in Bolivia lived far away from the water protesters, and failed to grasp their deep cultural attachment to water.



In order to understand that attachment, Simmons immerses herself in the places she studies. The most profound experience she had as a researcher was accompanying Cochabambans as they created irrigation channels to water their fields.

"They had communal events around opening and closing waterways, giving thanks to the Pachamama (the earth goddess)," she recalls.

Simmons was fascinated by the intricate community notebooks Cochabambans used to keep track of whose turn it was to open or close an irrigation channel.

"Very meticulous regulation was intertwined with a very spiritual connection," she says.

She sees a connection between the water protesters of Cochabamba and other indigenous water-rights activists, including opponents of the Dakota Access Pipeline who feared it would pollute drinking water for the Standing Rock Sioux Reservation in North Dakota.

"The message is not just about water as something physical that is necessary to survive, but a powerful piece of Native American identity," she says. "It goes beyond the actual physical presence of the pipeline."

Simmons points to the work of her colleague Kathy Cramer, the UW political scientist whose book *The Politics of Resentment* helped illuminate a growing sense of alienation among rural voters in Wisconsin.

"The idea that we interpret our politics through the lens of where we are living, and through the sense of self produced by our local community, is similar," Simmons says. "People's sense of self really matters in how they organize collectively." In 2008, hundreds of Mexican corn producers marched against the North American Free Trade Agreement in Mexico City.

Study a language? Sí. Ja. Oui.

For current students and recent grads, pursuing a language major opens up the world — and opportunities for their futures. BY KATIE VAUGHN

James Ungaretti is pursuing a double major in computer sciences and Italian.

hen James Ungaretti enrolled in his firstyear courses, he loaded up on requirements for a computer sciences major. But having taken four years of Italian

at his Oak Park, Illinois, high school, he thought, why not add an Italian class, too?

"I was really surprised by what I got out of it," says Ungaretti. "Before I began my studies at UW-Madison, I imagined myself cranking out gen eds and taking as many CS classes as possible. I wanted to focus 100 percent on CS. Instead, Italian – and L&S in general – have planted a deep interest in people, art and communication." Now a junior, Ungaretti is pursuing a double major in computer sciences and Italian. And by doing so, he joins a large cohort of UW-Madison students finding enhanced learning and widened opportunities by studying a language.

PHOTO: PAULIUS MUSTEIKI

Strategic Skills

The College of Letters & Science is a powerhouse when it comes to languages. Students may choose from more than 40 different modern languages as well as numerous classical and ancient languages, and an additional 20-plus languages are offered in the summer.

UW-Madison graduates more students with majors in languages other than English

than any other American university. Earlier this year, when the Chronicle of Higher Education investigated which colleges confer the most bachelor's degrees in languages, literatures and linguistics, it ranked UW-Madison as number two overall. The university also came in first in Spanish degrees, second in French and third in both Chinese and Russian.

This year, more than 2,600 students are studying a language. And many, like Ungaretti, are combining it with a separate course of study.

"Languages are the most common second major," says Dianna Murphy, director of the Language Institute, associate director of the Russian Language Flagship Program and executive director of the Korean Language Flagship Program. "Students want opportunities for language study and cultural learning."

Sometimes it's to continue a language they picked up in middle or high school. But often it's a strategic move with a specific career path in mind.

Students who participate in the Russian and Korean Flagship Programs know they will graduate with professional competency in their chosen language — and that there is demand for those skills. The programs, funded by the U.S. Department of Defense, support universities in preparing graduates with linguistic and cultural expertise deemed crucial for U.S. security.

Arabic and Mandarin are also what the government considers "critical-needs languages," according to Marie Koko, a career and internship specialist at SuccessWorks, the L&S career center.

But bilingual skills are helpful – or even essential – to jobs outside the public sector, Koko says. Budding international business executives will benefit from knowing more than just English, and scientists, too, have an advantage if they can converse where they'll be conducting field work.

"People who study science don't always think about it that way," she says. "But you need to be able to speak the local language."

A World of Opportunity

Students' reasons for studying a language are as varied as how they end up putting their skills to use. But one thing is certain — if you pursue a language, the world opens up to you in new ways. From studying, interning or working abroad to joining conversation groups or language-immersion residences in Madison, opportunities abound for students to enhance their language study outside of the classroom.

When Laura Bunn was an eight-yearold writing to a pen pal in El Salvador, she couldn't have predicted she'd one day study Spanish, international studies, journalism and Portuguese, or anticipated where these interests would take her.

After visiting Rio de Janeiro as a sophomore, Bunn returned to Brazil to intern with a non-governmental organization. "I conducted interviews entirely in Portuguese, transcribed them in English and wrote in-depth profile stories about community-based sustainability," she says. "Interviews with local community organizers taught me grassroots information about public policy issues in Rio de Janeiro."

The experience was foundational for Bunn's next steps: interning at the U.S. Embassy in Lisbon, Portugal, continuing an accelerated master's program at the La Follette School for Public Affairs and eventually starting a career in public service related to Latin America.

Competitive Advantages

While language fluency is appealing to many employers, companies also want graduates with a nuanced understanding of cultures.

As co-director of the Wisconsin Language Roadmap Initiative, which is strengthening language education to improve Wisconsin's economic competitiveness, Murphy knows the pressure companies face to compete internationally and the desire they have for employees with multilingual skills and cultural competencies.

"What we're hearing from businesses around the state is they need employees who can work on diverse teams and can successfully tap into markets at home and abroad," Murphy says.

Jake Meyers has certainly found a competitive advantage in studying both Chinese and mechanical engineering. The recent graduate began a job this summer working as a product engineer for Foxconn in Shenzhen.

"Although the basis of the job is an engineering position, the fact that I can speak Chinese, have been to China several times before and have a very strong interest in Chinese language and culture gave me an enormous advantage," he says.

Ungaretti is already prepared for how he's going to leverage his Italian major. Language study has instilled in him a preference for working with people with diverse backgrounds and perspectives.

"Interviewers can ask me about my Italian classes and I can talk about my communication skills," he says. "That's something that sets me apart." ■

LANGUAGE LINKS

Where can language study take you? Anywhere, as these graduates attest.



Ari Seckler is parlaying his degrees in Spanish and international studies, and experiences studying abroad in Argentina and interning with the Immigrant Justice Clinic, into a future as an immigration attorney.

"With the ability to speak and understand another language, you can connect with a community in a natural, authentic way that would otherwise be unattainable," he says.



Ashley Redjinski found rich opportunities to use her French and international

studies majors both near and far from campus, living at the French House, a French-immersion residence in Madison, and studying abroad in Aix-en-Provence.

"Even if you're unsure of how a language will serve you in the future, keep an open mind," says Redjinski, who now works in financial services in Milwaukee. "Because it will, some way or other. Knowing and understanding more of the world's humanity is never something you'll regret doing."



Alex Idarraga is taking skills gained through his Russian major and the Russian Flagship Program – particularly the year he spent living in Kazakhstan and interning at a hospital – with him as he starts medical school at UW-Madison this fall. "I'm confident that someday using my Russian will make a difference in someone's quality of care," he says. "I look forward to that day."



Textual Relations

ls the secret to lasting love at our fingertips? BY KATIE VAUGHN

ow's your day? Love you! Love you too.

A simple text message exchange with your partner can take all of 10 seconds. Yet those little pings could be key to relationship fulfillment, says Department of Communication Arts associate professor Catalina Toma, who studies how people relate to

one other through communication technologies. "They actually make a huge difference," Toma says. "It's a phenomenon we call mundane talk or everyday sharing – all those behaviors that keep a relationship alive."

While we tend to think of the gestures that keep romance thriving and relationships thrumming as grand or expensive – long talks, bouquets of roses, fancy dinners – Toma says texting and direct messaging on social media can be "major players" in the maintenance stages of relationships.

When you're interacting face-to-face, you have a variety of cues to pick up on, from your partner's choice of words to his or her voice inflection, pauses, facial expressions and body language. Perhaps surprisingly, Toma has found that reduced-cue environments like communicating via text messaging lead to higher levels of satisfaction in couples.

"Impoverished environments let us fill in the blanks," she explains. And when you have positive feelings toward your partner and feel secure in your relationship, you tend to assume those blanks are filled with love, appreciation and other good things.

Of course, you can fill those blanks in negatively, especially if the relationship is new or struggling. A cryptic message can feel unnerving if you don't know the sender's true feelings, and you can read the worst into any text if you're angry with or don't trust your partner.

But in strong and healthy relationships, brief messages checking in, expressing love or sharing an inside joke — any simple "thinking of you" signal — can further strengthen couples' bonds and increase satisfaction with each other and their partnership.

"Even a short text can be seen as a sign of attention and love," Toma says. ■

16

News&Notes



A Big Win

Actor, director, choreographer and L&S alumnus André De Shields (English Literature '70) added a Tony Award to his long list of film, TV and stage accomplishments. De Shields, who had been nominated on two other occasions, won for his memorable performance as the narrator in *Hadestown*, the popular Broadway musical that retells the Greek myth of Orpheus and Eurydice.

Presidential Pick

Erika Marin-Spiotta, a professor in the Department of Geography, is among this year's group of scientists to receive a Presidential Early Career Award for Scientists and Engineers (PECASE)

PHOTO: JEMAL COUNTESS / GETTY

from President Donald J. Trump. Marin–Spiotta, one of four UW–Madison pro– fessors from various schools and colleges to receive the award, focuses her research on the terrestrial carbon cycle and its effects on ecosystems.

After Incarceration

Pajarita Charles, an assistant professor in the School of Social Work, recently helped launch Parenting Inside Out, a 12-week, evidence-based skills training program aimed at assisting incarcerated parents make the transition to family life after release. The training focuses on communication and problem-solving, positive reinforcement, monitoring and non-violent discipline.

Making the Mueller Report

Research conducted by a group of UW-Madison graduate students led by lead author Josephine Lukito (mass communications, political science and English language and linguistics) was cited in the report produced by special counsel Robert Mueller. The team's research focused on the impact of Russian trolls on the 2016 presidential election.

Chilling in Washington

A sensor from the massive Antarctic observatory IceCube, headquartered at UW-Madison under the direction of physics professor Kael Hanson, has been added to the permanent collection of the Smithsonian Institution. The sensor, known as a digital optical module (DOM), detects the flash of blue light created when a neutrino crashes into a molecule of ice. Scientists recently used DOMs to decipher the origin of cosmic rays, particles that pelt Earth's atmosphere.

PHOTO: WISCONSIN STATE JOURNAL

HONOR ROLL



Young Mie Kim, a professor in the School of Journalism and Mass Communication, has been named a 2019 Andrew Carnegie Fellow by the Carnegie Corporation of New York for her research on how targeted digital ads influence elections.



Professor of political science **Katherine Cramer**, known for her book *The Politics of Resentment*, has been elected to the American Academy of Arts and Sciences. Her work shapes the national discussion of how individuals understand politics.



Each year, one student in the world receives the prestigious United Nations Watch Morris B. Abram Fellowship, and this year it was **Hilary Miller**, who graduated in May with degrees in history and political science and a certificate in Jewish Studies. She will spend the year in Geneva, Switzerland.



Trombone student Gregory Scheer and tuba student Jordan Dewester play in the Sing Man & Florence Lee / Annette Kaufman Rehearsal Hall, inside Hamel Music Center.

RÍ

Performing the Wiscossin Idea

With the opening of the Hamel Music Center and new programs and faculty, the Mead Witter School of Music hums with promise. BY MARY ELLEN GABRIEL



he dust had not yet settled inside the new Hamel Music Center when Jessica Johnson, professor of piano and pedagogy, stepped into the almost-completed rehearsal hall: lofty ceilings, interlocking bands of light, walls softened by acoustic panels. She clapped her hands sharply: one-two.

"Every performance space has its own personality and sound," she explained. "When musicians walk into a space, they test the sound."

The claps landed crisply and vanished. Afterward there was complete silence, though cars hurtled through the rain on University Avenue just outside the floor-to-ceiling windows. More than a foot of concrete wraps the rehearsal hall's interior walls. Three feet of air space separates the corner wall's two layers of glass. Sounds are not meant to enter, or escape, this room.

This is incredibly good news for faculty and students of UW-Madison's Mead Witter School of Music. After decades of rehearsing in the basement of the Mosse Humanities Building, UW's musicians will now have a state-of-the-art acoustic environment in which to prepare for performances. And the Sing Man & Florence Lee/Annette Kaufman Rehearsal Hall is just the prelude, if you will: The new Hamel Music Center, designed by Holzman Moss Bottino Architecture in part-nership with local firm Strang, also features a 650-seat Mead Witter Foundation Concert Hall and a 315-seat Collins Recital Hall. Acoustics were designed by Talaske/Sound Thinking of Oak Park, Illinois.

With a new name, a new performance center, a new director of the UW Marching Band (Corey Pompey), a new orchestra director (Oriol Sans), new professor of trumpet (Jean Laurenz) and programs like opera and jazz studies pulsing with new energy, the Mead Witter School of Music opens the door on a dazzling new decade.

The new Hamel Music Center anchors the corner of Lake Street and University Avenue, a new "jewel" in the gateway to the East Campus corridor.



Professor of violin Soh-Hyun Park Altino in the Hamel Musi Center's Collins Recital Hall.

ince its official opening in 1895, the School of Music has offered a rigorous, student-centered musical education. Collaborative, creative instructors enjoy teaching as much as they enjoy performing in ensembles. In fact, UW-Madison was the first public institution in the country to welcome artists-in-residence, with the creation of the Pro Arte faculty ensemble in 1938. And while the UW Marching Band (a key part of the School of Music) plays to thousands at Camp Randall Stadium and other venues during football season, there are more than 300 student and faculty recitals and concerts happening throughout the vear-not to mention dozens of outreach initiatives that take UW musicians out into the community and around the state.

"We are the Wisconsin Idea at its most audible," says Mead Witter School of Music director Susan Cook.

Director of Bands Scott Teeple concurs. What else is music, if not a means of connecting us all?

"What we do moves the human spirit," Teeple says. "It doesn't matter what your background, knowledge or level of experience is — music is a visceral experience. Look at the donors who made the new building possible: They didn't necessarily study music, and yet it spoke to them."

Pamela Hamel (wife of L&S alumnus George Hamel '80) provided the naming gift for the new center, and the Mead and Witter families from Wisconsin Rapids enabled the project to be fully realized at once.

"Music has always had an important place in our family," Pamela Hamel said at the time of the groundbreaking. "We feel privileged to be able to provide the university's music students and fellow lovers of music a world-class facility in which to learn, practice, perform and enjoy music. It's exciting for George and me to imagine just how many students will be able to benefit from and delight in the Music Center for years to come."

In 2015 the Mead Witter School of Music became the first department or school on campus to assume the name of a benefactor. Other donors helped realize the recital hall, rehearsal hall, green room and other spaces. The Hamel Music Center is the first building on campus to be funded entirely through philanthropy without state dollars. "I think the support from these donors says that music at UW-Madison is strong, and it deserves to be supported in new and bigger ways," says Teeple.

o fully appreciate the excitement around what this new building can and will do, you must first understand what the

old building wasn't and could never be. Take prior rehearsal space: cramped, damp and most definitely not soundproof.

"Imagine the Wind Ensemble rehearsing Stravinsky's 'Concerto for Piano and Winds' while in the next room are 300 members of the Varsity Band rehearsing at the same time. There was a lot of sound bleeding through the walls, which made it difficult to focus and listen," says Teeple.

Performers at Morphy Recital Hall and Mills Concert Hall dealt with humming



Our students deserve to play in spaces that are acoustically suitable for them.

SCOTT TEEPLE, Director of Bands HVAC, buzzing lights and slamming doors. Technology was outdated – cassette players, overhead projectors and reelto-reel videotaping were the only options. And prior to going on the stage, musicians had nowhere to wait.

"Musicians need a professional green room, to store instruments and be at ease before going onstage," explains Soh-Hyun Park Altino, professor of violin. "Before, we had to use a classroom, and performers left their cases on the floor in the hall and climbed stairs holding their instruments. This new building is so much more performer-friendly."

The Daniel Gregg Myers Green Room in the new music center offers a comfortable space with plenty of cubbies for instrument cases, where performers can warm up in advance of performing, and where friends and family can gather following performances. Students will have access to the Hamel Music Center's acoustic and recording technology, including streaming capabilities for audio and video.

Teeple calls the entire space a "stateof-the-art musical lab." And while there's no doubt that the sparkling new venue, located next to the Chazen Museum of Art, will add verve to Madison's cultural scene, Teeple and other faculty are most excited about what the Hamel Music Center means for UW-Madison's music students.

"Our students *deserve* to play in spaces that are acoustically suitable for them," Teeple says. "They have achieved success under challenging circumstances."

While classes and administration will still be housed in the Humanities building, the Hamel Music Center will more than meet the technological, acoustical and spatial needs for top-notch performances. It also raises



the bar for everything else, from teaching to performing, and it elevates the profile of the school, signifying that UW-Madison is a place where music matters.

here has always been, says Daniel Grabois, professor of horn, a sense of larger possibilities within the Mead Witter School of Music: for collaboration, for interesting research, for innovative teaching. It's part of the spirit of the school.

Grabois leads the UW Horn Choir in winter concerts at the Chazen Museum of Art, continuing a 45-year tradition started by his predecessor. But in the spring, he turns the Horn Choir into a rock band called Twisted Metal. Students can play whatever rock music they want, but they have to create the arrangements.

"Students know how these pieces are supposed to sound," he says. "But then you put the instrument in their hands, and they've never played that way before. It leads to a general stylistic awareness if you had to re-learn what you thought you knew, in order to play rock music, then maybe you can bring that learner's mindset to playing Mozart."

Grabois also runs EARS (Electro-Acoustic Research Space), where he teaches students how to create music with electronic instruments processed through computer software. As of now, demand far exceeds available classroom space – but Grabois is committed to "doing incredible things with what we've got."

For Grabois, teaching is all about imagination.

We intend to expand opportunities for our students, attract top-notch performers and forge partnerships of all kinds.

SUSAN COOK, Director, Mead Witter School of Music

"Music is an art form," he says. "And the more you can encourage students to imagine what they want to achieve – instead of just focusing on technique – that's the human way to learn."

any music faculty spearhead game-changing outreach initiatives. Teeple leads Winds of Wisconsin, an intensive music-making experience that unfolds over two semesters, and gives high school students additional skills to develop as musical leaders within their schools. Johnson leads Piano Pioneers, a program that links UW-Madison student musicians with lower-income Madison families to provide high-quality piano instruction that would otherwise be unaffordable. Altino visits middle schools and high schools around the state, listens and observes, and asks: "What's missing?" As a result of one such close collaboration, an undergraduate string quartet will perform the original compositions of middle-school students from a public school in Madison.

"Just going in and performing for them does not close the gap," says Altino. "But supporting the music teachers, being able to talk with young students and help them with what they are working on, that makes an impact."

Faculty offer workshops and master classes to band leaders and music teachers in the area. And many faculty create original works, including Laura Schwendinger, professor of composition, whose opera *Artemisia* was performed in a world premiere in New York last fall, and whose special fanfare will be performed at the building's opening celebration.



current of excitement runs through any conversation about the coming year in the Mead Witter School of Music. "I'm really excited," says Teeple. "We are doing some pieces that I am so geeked out about."

Among them: a piece commissioned by Omar Thomas called "Of Our New Day Begun," dedicated to those who lost their lives in 2015 at the Emanuel African Methodist Episcopal Church in Charleston, S.C., and a brand-new symphony by Jodie Blackshaw, an Australian composer. All student ensemble performances are free and open to the public (and can be found at music.wisc.edu/events).

And the school is expanding its reputation as a place for collaborative, innovative musicians to teach and study. Johannes Wallmann, a veteran of the New York and San Francisco Bay Area jazz scenes, arrived in 2012 to lead a new Jazz Studies program. Opera, too, is on the rise. Since 2015, University Opera has been the proud recipient of four National Opera Association Opera Production Competition awards, as well as Honorable Mention in 2018 for The American Prize (*Falstaff*).

Susan Cook looks forward to the coming decade.

"We will expand opportunities for our students, attract top-notch performers and forge partnerships of all kinds," says Cook. "We want to find new audiences and engage them in different ways. We have only begun to imagine the possibilities ahead of us." ■ • THE INTERIOR COLOR SCHEME reflects Wisconsin's natural landscape: the blue lakes and the rich plums and golds of the maple leaf, our state tree.

RECLAIMED WOODEN PLANKING in the Collins Recital Hall comes from tribal lands of the Menominee Indian Tribe of Wisconsin.

> IMAGES FROM A WORK by Tandem Press founder William Weegee —"Like a Rolling Stone" animate the wallpaper in the Collins Recital Hall.

THE CUSTOM COPPER PIPE CHANDELIER is a gift from the Class of 1965 and was made in Sheboygan, Wisconsin.

> is pleased with "the rhythmic exterior facades, the use of regional materials and the introduction of natural light in the rehearsal space."

Building design by Holzman Moss Bottino Architecture, in partnership with Strang and JP Cullen as General Contractor. Acoustic design by Richard Talaske/Sound Thinking.

Knowledge on Display

One of the Board of Regents' first orders of business, after the university's founding in 1848, was to call for a "cabinet of natural history" to collect and curate the state's plants, animals and minerals. Today, in the spirit of the Wisconsin Idea, museums and special collections across the College of Letters & Science continue to maintain and showcase incredible resources to enhance learning and spark curiosity.

Rocking On

GEOLOGY MUSEUM 1215 W. Dayton St. geoscience.wisc.edu/museum/

> hether it's the sparkling gems, prehistoric fossils or looming mastodon skeleton, the exhibits

at the Geology Museum regularly elicit *oohs* and *ahhs* from visitors.

"Every day there's an auditory reminder of the wonder we provide," says assistant director and outreach specialist Brooke Norsted.

The museum, located in Weeks Hall, is open to the public Mondays through Saturdays and receives more than 50,000 visitors a year who come on their own or as part of a tour. Vistiors can see – and even touch – a meteorite, and explore rocks and minerals, including some glowing in a blacklight-illuminated room. Additional highlights are the Earth's oldest rock and Earth's oldest fossil, 4 billion and 3.4 billion years old, respectively.

"We have many superlatives here," says museum director Richard Slaughter.

But young visitors love the museum's finale – a room filled with the skeletons of a mastodon and *Edmontosaurus annectens*, the first dinosaur put on display in Wisconsin.

The museum also uses its collection of more than 120,000 geological and paleontological specimens for education, research and, increasingly, outreach. Staff have offered creative programming throughout and beyond Wisconsin, at stock pavilions, minor league ballparks and holiday events.

"It's nice to mix things up," Slaughter says, "and find new ways to think about teaching the same trilobites." PHOTO: PAULIUS MUSTEIKIS

The Boaz mastodon is actually the remains of two mastodons discovered in rural Wisconsin in 1897 and 1898. **t's impossible** not to tinker at the L.R. Ingersoll Physics Museum. Fortunately, that's by design. The 70-plus objects displayed around the goldenwalled room in Chamberlin Hall are made for hands-on experimenting.

Most people don't even need to read the exhibits' directions, says instructional program manager Steve Narf. "It's more about, 'Let's figure out how this works, and then why it works," he says.

When visitors spin a coin down the gravity well, play particle physics pinball or clank the balls of a Newton's Cradle, they're having fun, learning and discovering that physics doesn't have to be intimidating.

"Physics is nothing scary," Narf says. "It's just a term. It's the study of motion."

Nearly 9,000 children come through the museum each year, and visitors can pop in during regular hours (8 a.m. to 4 p.m. on weekdays) or sign up in advance for a guided tour. Narf especially enjoys overhearing their comments.

"I hear kids say, 'I like physics now.'"



When a radiometer, invented in 1873, is exposed to light, its rotor with four lightweight metal vanes rotates.

Science in Motion

L.R. INGERSOLL PHYSICS MUSEUM 1150 University Ave., physics.wisc.edu/ingersollmuseum

PHOTO: PAULIUS MUSTEIKIS

A bronze figurine of a crawling baby Krishna.

Cultural Clues

1180 Observatory Dr. anthropology.wisc.edu/collections/

> he Anthropological Collections date back to 1929, when the Department of Anthropology was founded and faculty brought in items from the field. The collections have since grown to include pieces of prehistoric pottery, spear points, stone tools, skeletal remains and other items from Wisconsin and far beyond.

"Our collection is international," says academic curator Elizabeth Leith, "because our faculty work all over the world."

Some of the collection's artifacts go on display in cases on the fifth and sixth floors of the Sewell Social Sciences Building, but most are tidily tucked away in storage.

"We're a museum, but we don't have much exhibit space," Leith explains. "Our collections have always been used for both research and education."

Of course, the collections are always growing as work continues in the field, and those finds naturally make their way into classrooms, labs and outreach events such as public lectures and school visits.

"The discipline has historically supported collecting," Leith says, "and those collections help bolster our academic programs."

Animal Kingdom

ZOOLOGICAL MUSEUM 250 N. Mills St. uwzm.integrativebiology.wisc.edu

here are skeletons in Noland Hall's closets. No, they're not secrets about the Department of Integrative Biology, but rather, part of the 750,000 specimens that make up the Zoological Museum.

The museum maintains specimens of mammals, fish, birds, reptiles and additional creatures, many of them from Wisconsin. Cabinets contain animal skeletons and skins, while shelves store jars filled with a fascinating variety of fish, snakes, lizards and crayfish. Several taxidermy animals, including a large polar bear on display in the lobby of Birge Hall, round out the collection.

A special emphasis is skeletons, with close to 20,000 specimens representing all vertebrate classes.

"There are so many things you can learn by looking at skeletons," says curator of collections Laura Monahan.

Space for public programming is limited, so the museum primarily serves researchers and students fascinated with the animal world. And it continues to collect specimens—about 1,000 a year as donations come in from researchers, the Wisconsin Department of Natural Resources, the U.S. Fish and Wildlife Service and zoos.

"We don't ever know when it's going to happen," Monahan says of donations. "It makes every day different."

> A mounted wolf from the museum's mammals collection.

Specimens of northern beech fern (*Phegopteris connectilis*, left) and wild lupine (*Lupinus perennis*, right).

Deep Roots

WISCONSIN STATE HERBARIUM 420 Lincoln Dr. herbarium.wisc.edu

> ows upon rows of metal cabinets in Birge Hall contain the state's history in plant form – through more than 1.3 million specimens. "Every one tells a story," says Ken Cameron, director of the Wisconsin State Herbarium.

The herbarium's collection includes hundreds of pressed and dried specimens of the same species, labeled with the date, location and other details that allow scientists to track a plant across time and space, and understand its natural variation. "Every year that passes, these specimens become more valuable," says Cameron, who also chairs the botany department. "They're our window into the past. They're a time machine."

The collection started with a box of specimens that naturalist and scientist Increase A. Lapham donated to launch the herbarium in 1849. And scientists continue to collect samples of vascular plants, bryophytes, fungi, lichens and more, while staff and volunteers process the specimens to be stored in the herbarium and digitally catalogued. Nearly 300,000 have already been added to online databases, which are available to the public.

Additionally, students, researchers and nature enthusiasts can request access to the herbarium's collection. Cameron initially worried that people would stop traveling from around the world to see the plant samples in person once they could view them online. But visits have actually increased.

"People learn what we have here and want to see it for themselves," he says.

Star Treatment

2300 S. Park St. #100 spaceplace.wisc.edu

1401 Observatory Dr. astro.wisc.edu/the-public/public-observing-at-washburn/

> id you know UW-Madison scientists made crucial contributions to the space exploration boom in the 1960s? And that the university continues to be a leader in astronomical research and innovation? "That's where our footprint really is - science in space," says James Lattis, director of Space Place, the education and public outreach center of the astronomy department. "Having artifacts right in front of visitors really brings that alive."

> Imaginations soar when visitors get up close to five complex instruments that flew in space, including the High-Speed Photometer, an original piece of the Hubble Space Telescope.

Space Place hosts roughly 10,000 visitors each year and holds a robust array of more than 100 public events, including viewings of the night sky on its rooftop Skydeck.

Stargazing is also a specialty at the Washburn Observatory, which has been welcoming the public since 1881.

Today, astronomy graduate students offer free public observing on the first and third Wednesday of each month, weather permitting, using a historic Clark telescope.

"Most people have never seen a big, old-fashioned telescope like that," Lattis says. "It was built in the days when astronomers really looked through telescopes and made observations by looking through the eyepiece."

While the telescope is now considered obsolete for scientific purposes, Lattis says it's still a thrill to use. "Suddenly you see spots on Jupiter or a double star you haven't seen before."

Tarnished lenses of the Washburn Observatory telescope, before their historic cleaning in 2012.

COLLECTIONS COLLABORATION

The Board of Regents was certainly on to something 170 years ago when it envisioned a university-run collection of natural resources. Today, a group of scientists is working on a major technological update on the idea.

A UW2020-funded project will centralize the databases of the university's five natural history units - the Wisconsin State Herbarium, the Geology Museum, the Zoological Museum and the Anthropological Collections, all in the College of Letters & Science, and the Wisconsin Insect Research Collection in the College of Agricultural & Life Sciences – to make more than 11 million specimens available to researchers and the public online.

"We're bringing it from a 19th-century Victorian collection to a 21st-century collection in the digital age," says Ken Cameron, director of the herbarium and project lead, adding that the goal is to have the "online data portal" up and running by 2020.





FOCUS FORWARD

For more than half a century, the UW Institute for Research on Poverty has built a national reputation for policy guidance, trend-spotting and cutting-edge research into one of society's most intractable problems.

Since 2014, state legislatures across the country have spent time debating a policy question familiar to anyone who's been following headlines: *Should federal dollars be accepted in order to expand Medicaid coverage for individuals above the federal poverty line?*

Here in Wisconsin, Marguerite Burns and Donna Friedsam, Madison-based researchers affiliated with the University of Wisconsin Institute for Research on Poverty (IRP), were hard at work, using state insurance-claims data to determine what happened to the group of Wisconsin residents who dropped out of the Medicaid program when the state changed the eligibility requirements in April 2014. "We're doing research on one of the most controversial questions facing our state," says Friedsam. "And not just for our state. This is of national import."

This is nothing new for IRP, an organization that has been positioned on the cutting edge of poverty policy guidance and research since its inception in 1966 as the research arm of then-President Lyndon Johnson's War on Poverty. It's enjoyed federal funding throughout its 52 years of existence. In fact, it is currently the only federally funded national poverty research center, having won the latest national competition for the five-year designation in 2016.

Centrally housed in the Sewell Social Sciences Building, IRP encompasses more than 200 affiliated researchers, both on the UW-Madison campus and across the country, as well as 20 dedicated support staff. Those researchers represent a dizzying array of disciplines, from economics, social work and sociology to nursing, population health and political science, pairing their perspectives to tackle a deeply complex and multifaceted problem.

"We're really grounded in real-world, actionable research questions and two-way conversations between the policy world

FOCUSED ON A DIVERSE FUTURE

IRP puts considerable resources into training a diverse new generation of poverty researchers to tackle the emerging policy questions of tomorrow. In the early 1990s, IRP began a visiting scholar program aimed at underrepresented racial and ethnic populations, attracting four to five students each year to study with IRP researchers. Three years ago, IRP formed a partnership with Howard University to train underrepresented PhD students, giving them extensive mentorship opportunities and helping them move toward their dissertations. Each year, more than 90 students apply.

"Poverty populations tend to be disproportionately of color," explains Katherine Magnuson. "If we're going to make inroads, it's critical that we're training a diverse set of scholars, providing them with opportunities to succeed and rise through the ranks."

and the practice world," says Lawrence Berger, who served as IRP's director for the last five years before stepping down this summer. "We're a really great example of the Wisconsin Idea."

IRP tackles poverty from every possible angle and factor - child support, education, health, the justice system and more – but the big key to its sustained success has been its ability to remain studiously nonpartisan. Through Democratic and Republican administrations at the state and federal levels, the institute has maintained good relationships and remained effective.

"We make a strong point of not taking ideological positions, but rather presenting the evidence," explains Berger. "Rarely do we say, 'You should do this.' Instead, we say, 'Here is what the evidence says about what might happen if you do this."

Berger's own research is a perfect example. For years, he's been researching educational, economic and social outcomes for children in Wisconsin's foster care system. Several other states had issued reports linking foster care to children performing poorly in school, but Berger and his colleagues, including former IRP director Maria Cancian and Jennifer Noyes, now the College of Letters & Science's associate dean for operations and staff, suspected there was more to the story. Working in concert with the Wisconsin Department of Children and Families and the Department of Public Instruction, Berger's team compared the test scores of kids in foster care to groups of other disadvantaged kids, instead of

comparing them to average kids. Suddenly, what seemed a massive achievement gap largely disappeared.

"The implication is that the whole group of kids who are involved in the child welfare system, whether they go into foster care or not, are at high risk of doing poorly educationally," explains Berger. "You don't have to wait for foster care to be a trigger. That's not the moment to intervene. This is about a trajectory."

A DATA JUGGERNAUT

Berger's work, like most of IRP's research projects, is made possible by the institute's biggest asset: access to one of the most extensive networks of administrative, poverty-related data in America, dating all the way back to the 1980s. Drawing on strong, longstanding relationships with administrators of state and federal programs - many of whom have turned to IRP over the years for answers to their vexing, poverty-related policy questionsthe institute is able to harmonize these data sets, giving IRP researchers access to the information they need. Armed with this data, researchers can follow families across generations, measuring the impact of policies and programs on the lives of low-income populations.

"The data expertise and infrastructure IRP has developed are unique," says Burns, who relies extensively on both for her Medicaid waiver work. "They allow us to link data across these programs - Medicaid and the Department of Corrections,



DREAMUP

As Berger noted, IRP's focus has always been on actionable policy. Nowhere is that more evident than in DreamUp Wisconsin, the Alliance for the American Dream competition funded by Schmidt Futures, the philanthropic organization formed by Wendy and Eric Schmidt, the former CEO of Google. Teams were asked to brainstorm creative ways to raise the net incomes of 10,000 Wisconsin families by 10% by 2020. IRP solicited and administered proposals for the competition, which this year saw two UW-Madison based groups win significant funding for ideas related to civil legal issues and raising awareness of Wisconsin's child care subsidy program.

FoodShares - and learn how individuals move from one program to the next. We could not do that without the expertise and infrastructure IRP has developed. It's just not possible."

FEDERALLY FOCUSED

Like many of the researchers affiliated with IRP, Daniel Meyer came to the UW specifically to work with the Institute.

IRP THROUGH THE DECADES

ent Lyndor B. Johnson ivering the 1964 State of the Union address, in which he declared 'all-out war on poverty

The UW Institute for Research on Poverty (IRP) is established, becoming the first national center charged with researching the causes and cures of poverty. An early IRP research project was an examination of the New Jersey Experiment on Negative Income Tax, one of the first U.S. attempts to create a basic income guarantee for its citizens

9 1975-80

IRP first begins to develop its reputation for quantitatively studying large bodies of data. IRP affiliates conducted the **National Supported Work** Demonstration, a research project that showed that placing difficult-to-employ citizens in a supportive work environment for a year made them more employable.

9 1982

In partnership with Wisconsin state government, professors Irwin Garfinkel and Marygold Melli begin an evaluation of child support policy, a research partnership that continues to this day.

Ο 1983

IRP, under then-director Eugene Smolensky, begins research on immigration and poverty that will, decades later, dispel popularly held misconceptions about the impact of immigrants

on the U.S. labor supply.

IRP Discussion Page

Meyer, a professor in the School of Social Work, has been here more than three decades and has seen IRP evolve from a state-focused organization to one that's now equally focused on povertyrelated topics at the federal level. Along the way, he's seen IRP's work become more quantitatively, qualitatively and ethnographically sophisticated.

Meyer's work focuses on policies that affect the economic well-being of single-parent families. In his most recent study, Meyer collaborated with Cancian on a federally funded project called the Child Support Noncustodial Parent Employment Demonstration (CSPED). Wisconsin was one of eight states selected to work with child support program administrators to measure the impact of providing additional services (employment and parenting support) to parents struggling to keep up with child support payments. While the results of the study proved ambiguous there was a decrease in the number of child support orders issued but no increase in the amount of support paid – the level of satisfaction parents reported with the child support services dramatically increased.

"The fact that this intervention improved some things and not others shows us a sense of the next stage of the evolution in trying to make policy better," says Meyer. "Policy makers need to figure out, is it better to not provide any services for this population? Or should we try a more intensive (and expensive) intervention to get people on a different track? Now the choices are clear." Federal administrators were quick to recognize IRP's contributions and the project's worth. In the coming year, Wisconsin will expand the program from two counties to five.

EXPANDING THE VISION

In August, Katherine Magnuson took the reins as IRP's 15th director. She's been with the Institute for 15 years after coming to UW in the early 2000s, initially hired as part of a campus-wide initiative to recruit a cluster of poverty researchers. After years of serving as IRP's associate director for research and training, she's hoping to continue to build on the institute's data resources, perhaps leveraging new types of data IRP doesn't currently store – things like housing data – to examine public health and poverty questions such as the possible link between lead exposure and test scores among children.

"It's sometimes easy to ask questions about existing programs," says Magnuson. "Things like, 'What happens if we increase food stamps?' But I think one of the things IRP has been good at is saying is, 'What are the types of strategies that are not yet a program? What happens if we think about new ways to tackle poverty?'"

Magnuson is currently heading a project that does just that. It's an unconditional cash transfer program in which struggling new mothers are given \$4,000 (from philanthropic sources) to improve their family situations. Unlike some research projects, there's a strong scientific angle: Magnuson's team plans to measure the brain waves of the children and stress levels of the mothers to determine whether the intervention has had a positive impact.

Other evolutions are also afoot. In July, the institute signed a \$2.8 million contract to place Friedsam and Burns' Medicaid work at IRP under the newly formed Medicaid Evaluation Research and Technical Assistance (MERTA) unit. The new arrangement substantially expands the partnership between UW and the state Medicaid agency in working with claims and other data.

"It is meant to be of service to the needs of the Medicaid program," says Burns. "State agency officials can pose questions for IRP research and for improving Medicaid quality, efficiency and outcomes. UW researchers can initiate questions for Medicaid agency consideration that could benefit Wisconsin's 1.2 million Medicaid members."

Burns and Friedsam anticipate their first round of results in November, but it's far from the last time IRP will provide a research-based answer to a critical and complex poverty question.

"The important thing about IRP is that it's always forward-looking, despite its long history," says Magnuson. "It's a real national and state treasure." ■



A Lineage of Learning

His surname is synonymous with science on campus, but Wayland Evan Noland supports the College of Letters & Science to ensure that intellectual pursuit remains strong into the future. BY KATIE YAUGHN hen Wayland Evan Noland would traverse campus in the wee morning hours, it wasn't to stumble home after pulling an all-nighter for a class. Rather, he was headed to the piers, near what are now the Lakeshore dorms, at 3:30 a.m. to begin the day his preferred way.

"One of the things I liked to do was go fishing, and Lake Mendota was proximate," explains the 1948 graduate.



It's an understatement to say Noland knew his way around campus. In fact, he essentially grew up at UW-Madison, thanks to his history professor grandfather, Wayland Johnson Chase, and his father, longtime zoology professor Lowell Evan Noland. And the third-generation Badger, who earned a bachelor's degree in chemistry, continues the legacy his elders started through generous support of faculty and students in L&S.

Noland's parents met while pursuing graduate degrees in zoology at UW-Madison. While Ruth Chase Noland left her academic career to raise her son, her husband taught here from the 1920s until his retirement in 1966. Lowell E. Noland Hall, home to the Department of Integrative Biology, previously zoology, is named in his honor.

Research and teaching kept his father busy, so Noland spent much of his childhood with his grandfather, who took him fishing on Madison's lakes and nearby trout streams. Noland attended the university-run Wisconsin High School, and when it came time for college, choosing UW-Madison was "the natural thing to do."

Noland started out with an interest in science, but took a wide range of classes, even as limnology and chemistry attracted his attention.

"I had a splendid run of teachers in all different areas," he says, adding that he even took one of his father's zoology courses. "He was an excellent teacher and lecturer," he says. "And you can bet I was expected to perform very well." In February of 1945, Noland was drafted into the Army, where he was trained as a medic and surgical technician to serve in World War II. The plan was for him to be part of an invasion of Japan, but the dropping of the atomic bombs in August spared him from combat.

After graduating from UW-Madison, Noland earned a master's degree and PhD in chemistry at Harvard University. A post-doctoral position at the University of Minnesota led to an incredible 64-year career as a professor of chemistry, starting out in physical organic chemistry and later shifting to synthetic and mechanistic organic chemistry.

While he retired from teaching on the last day of 2016, Noland has continued his research, and plans to do so as long as possible. "I'm extremely busy," he says. "I can say I've never worked harder."

At age 92, Noland leads his lab in Minnesota, where about 10 researchers synthesize compounds that have potential pharmaceutical value for combatting disease. His staff have synthesized roughly 7,000 compounds in the course of his career, and Noland is still relentlessly pursuing compounds that will lead to viable drugs.

Noland also invests in the future – and continues his family's multigenerational connection to the university – by encouraging his niece and nephews, including UW-Madison anthropology alumnus Howard Blaine Campbell, who teaches at the University of Texas at El Paso, and supporting the College of Letters & Science.

To ensure that future generations enjoy the high quality of teaching and the excitement of discovery that set Noland on his life's path, he has established distinguished chairs in the departments of chemistry, integrative biology and limnology, and also contributes funds to help those units support student research.

And Noland's advice for students and faculty alike is what has served him well in his long and successful career.

"Work hard. Focus on what your goals are. Always treat people as nicely as you can." ■

Supported in Science

Meet the three Wayland E. Noland Distinguished Chairs, chosen to further scientific pursuit in their distinctive fields.



Daniel Weix CHEMISTRY

Weix is developing new ways of making molecules from common feedstocks that are useful in the pharmaceutical industry. "It is a great honor to be named to a chaired position in general," he says, "but all the more exciting to be named to a chair that was funded by a notable organic chemist and faculty member who is so strongly connected to the University of Wisconsin."



Seth Blair INTEGRATIVE BIOLOGY

Blair is an internationally recognized researcher investigating animal development, using the many genetic and molecular tools available in the fruit fly *Drosophila*. Like Noland, Blair is deeply committed to undergraduate education: "It is an honor to receive a chair named for a scientist and educator of such skill and passion."



Jake Vander Zanden LIMNOLOGY

The director of the Center for Limnology seeks to understand the ecology and management of, as well as threats to, our rapidly changing freshwater lakes. He is inspired by Noland's lifelong contributions to the advancement of science and education. "He is an amazing alumnus who embodies the Wisconsin Idea," he says.

Sift&Winnow





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LLUST RATION:

PETE RYAI

David Baum

a professor

of botany,

specializes in

evolutionary

biology and the

He is a member

of the American

Association for

of Science.

the Advancement

origins of life.

of the natural world in all of its complexity and weirdness.

Specifically, I strive to grasp how the remarkable diversity of lifeforms on our planet came to be. In this endeavor.

l draw on thought, observation and experiment. And, of course, on insights emerging through teaching.

The classroom has always been a space in which I can sharpen my understanding and take a fresh look at my field through the eyes of students not burdened by too many preconceptions. In fact, I am involved in an ongoing research program that would have never come to be had I not spent some 20 years lecturing on the origin of life to introductory biological sciences students.

In my view, any biology course needs to address the elephant in the room: How did life on Earth get started?

Some have argued that this is not a problem of biology but one of chemistry and planetary science: namely the transition from geochemistry to biochemistry.

But I believe that any biology student, from undergraduate to full professor, should ponder how life began. Consequently, I have brought the thorny problem of the origin of life into almost all my classes.

What I did not expect was that this semester-bysemester tickling of my curiosity would eventually lead to ambitious NASA- and National Science Foundationfunded experiments aimed at generating artificial life – new chemical systems capable of perpetuating themselves and evolving adaptively.

As I revisited the origins of life literature in each class, I came to recognize a pervasive, yet unwarranted, assumption that life's emergence required extremely rare and improbable circumstances.

If that were true, then experimental work on the origin of life would be of limited use. But what if, as Darwin imagined in 1871, life of the simplest kind can readily arise "ready to undergo still more complex changes" just so long as modern life is not around to devour it?

In that case, it ought to be possible to use evolutionary principles to design laboratory experiments to search for artificial life.

Some five years ago, I decided to put this theory to the test. Fortunately, I was able to draw in many wonderful collaborators, both at UW-Madison and elsewhere, and to convince grant panels to invest substantially in a novel approach. And I was also lucky to recruit many wonderful undergraduate and graduate students who share this passion for discovery.

Experiments are ongoing, but I will say that we have already obtained some intriguing results.

Whether or not we succeed in discovering artificial life, this research will surely advance our understanding of how life originates and enable me to provide students a more compelling explanation for the very existence of biological diversity.

The implication is clear: Teaching can lead to understanding on the part not only of students but also of the professor. ■

36

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to teach, learn and discover. In this magazine, we rely on words and pictures to tell our story, but sometimes numbers say it all!

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Last Word

This past spring, art conservator Cricket Harbeck carefully cleaned "Man – Creator of Order and Disorder," a mosaic by James Watrous installed in the William H. Sewell Social Sciences Building in 1963. Watrous, a UW alumnus and former faculty member, also created mosaics now found in Ingraham Hall, Vilas Hall and Memorial Library, and he painted the Paul Bunyan murals in the Memorial Union in the 1930s.

PHOTO: BRYCE RICHTER

