

IN A NEW LIGHT

The Klingler College reimagines how the humanities and those who study them serve the greater good.



FROM THE DEAN

Dr. Heidi Bostic
Dean, Klingler College of Arts and Sciences

As I reflect upon the past year, my heart is filled with gratitude. We have faced new challenges with courage and creativity. Thank you to our faculty members who taught students across multiple modalities, carried out research and engaged in transformational public-facing work. Thank you to our staff members who worked so hard to keep the enterprise going, support students and enable the whole university to continue our mission. Thank you to our students for adapting to new class experiences and modes of learning and fostering community with your fellow students, faculty and staff during a most unusual year. Thank you to our alumni and friends for your enduring support.



program to foster healthy conversations about our world's most pressing problems, the capacity of popular social networks to engage students and the power of the Education Preparedness Program to create new possibilities for currently and formerly incarcerated members of our community.

We are celebrating the Ignatian Year, which commemorates the 500th anniversary of St. Ignatius' cannonball moment that changed the course of his life and the 400th year of his canonization as a saint. The celebration provides an impetus to consider our understanding of self and world and to foster practices and habits that nurture our mutual flourishing.

A special thank you to Senior Assistant Dean Mary Minson, who retired in May 2021 after 38 years of devoted service. Through the Arts and Sciences Advising Center and across campus, Mary provided thousands of students with the guidance and resources they needed to succeed. We celebrated her career with a joyful virtual event in August. If Mary played a role in your journey, I invite you to consider making a gift to the Mary Minson Endowed Scholarship Fund.

Thank you for your active engagement with the Klingler College of Arts and Sciences. I would love to hear from you!

Heidi Bostic

“As I reflect upon the past year, my heart is filled with gratitude. We have faced new challenges with courage and creativity.”

The Klingler College of Arts and Sciences is the foundation of Marquette University. This 2021 issue of A&S magazine illustrates our work across disciplines to create an integrated experience in the classroom and beyond. Our cover story demonstrates the power of the humanities to shape students' lives and address grand challenges. Related stories describe the launch of our Civic Dialogues

IGNATIAN MOMENT

And yet in the midst of our lives, of our freedom and our struggles, we have to make a radical, absolute decision. And we never know when lightning will strike us out of the blue. It may be when we least expect to be asked whether we have the absolute faith and trust to say yes.

— Rev. Karl Rahner, S.J., excerpted from *The Great Church Year*



MARQUETTE UNIVERSITY KLINGLER COLLEGE OF ARTS AND SCIENCES MAGAZINE 2021

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Editor
Sarah Koziol, Arts '92

Art director
Sharon Grace

Editorial team
Stephen Filmanowicz
Kim Patterson
Jennifer Russell
Karen Samelson
Stacy Tichel

Photographers
John Sibilski, pp. 10, 16

Illustrators
Mark Airs, p. 4;
Sam Falconer, p. 8;
Ken Orvidas, cover and p. 18; Keith Negley, p. 14;
Michael Sloan, p. 13

  
@muartsscience
marquette.edu/arts-sciences

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DEEP LEARNING

DATA-CENTERED GRADUATE OFFERINGS FLOURISH.

Marquette's Master of Science in Computing program jumped to No. 6 nationally on *U.S. News & World Report's* 2021 list of Best Online Master's in Information Technology Programs. *U.S. News'* rankings in this category are based on student engagement, faculty credentials and training, student services and technology, peer reputation and admissions selectivity. Marquette's master's program offers specializations in information assurance and cyber defense, and the computing career change opportunity.

This fall the Graduate School also launched a Master of Science in Data Science program to tackle today's problems in the ever-growing data-driven world through theory-based and hands-on data analytics courses. Students can choose from two specializations — big data or machine learning — or complete a research-based thesis option. Visit marquette.edu and search "Graduate School degrees" for more information on both these programs.



Photo courtesy of Mauricio Ramirez

SHARING STORIES

PODCAST AND CAMPUS MURAL UPLIFT VOICES OF WOMEN OF COLOR.

It started with the north-facing wall of Holthusen Hall transforming into a head-turning, community-impacting mural project painted by artist Mauricio Ramirez. Then the mural, *Our Roots Say That We're Sisters*, inspired a podcast series of the same name. Both efforts aim to showcase the diversity, richness and complexity of Marquette's campus and surrounding Milwaukee communities by amplifying the stories of female-identifying students, faculty, staff and alumnae of color who personify positive leadership.

Dr. Nakia Gordon, associate professor of psychology and faculty fellow in the Klingler College Dean's Office, was the inaugural guest when the podcast was introduced this March. Gordon shared her story about growing up in Detroit and how that plays a role in who she is. "I tell my story to students exactly the way I am, because that's the only way that I can be, and I also hope that gives them a sense that they can be exactly who they are," Gordon says.

Visit our-roots-say.captivate.fm for archived episodes of the podcast.

MAJOR UPDATE

NEW PROGRAMS IN EMERGING FIELDS FOCUS ON PROFESSIONAL OPPORTUNITIES AND COMMUNITY IMPACT.

41
majors

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minors

The Klingler College has introduced three new majors this fall to its academically diverse program options: environmental science; statistical science; and Middle East and North Africa studies.

The **environmental science** major is an interdisciplinary program that complements the environmental studies major introduced in 2016. The curriculum integrates a fundamental understanding of the ecology of natural ecosystems and the processes by which humans influence, exploit, evaluate, conserve and restore their environment. Emerging career opportunities for graduates include environmental scientists, protection technicians, conservation scientists and environmental consultants, just to name a few. (See related story on p. 22.)

As the employment outlook in statistics has grown tremendously in the past 20 years, the new **statistical science** major

will complement the Department of Mathematical and Statistical Sciences' offerings and build upon faculty expertise in computational statistics and statistical areas to provide students with a uniquely technical analytics program. The major also satisfies a goal of the Northwestern Mutual Data Science Institute, of which Marquette is a partner, to expand Marquette's data science program offerings.

The **Middle East and North Africa studies** major arose from a growing interest from students in current Arabic language and culture courses. The interdisciplinary program was developed from that course work and provides knowledge in the languages, histories, theology and cultures of this diverse area of the world. Graduates can find careers in a variety of fields including education, law, government, armed forces and international affairs.

HUMANITIES MATTER

CENTER FOR THE ADVANCEMENT OF THE HUMANITIES CONTINUES IMPORTANT CONVERSATIONS UNDER NEW LEADERSHIP.

"The humanities are at the heart of Marquette's Catholic, Jesuit mission," says Dr. Andrew "Drew" Kim, an associate professor of theology who was recently named the director for Marquette's Center for the Advancement of the Humanities. "I envision the future of the Center for the Advancement of the Humanities as catalyzing and enhancing the exciting work already being done on our campus and translating this to engage challenges facing the wider community and the world."

Kim, who started in his new role this summer, joined the Marquette faculty in 2017. His research and teaching focus on the theology of addiction and recovery, and he has also written on virtue ethics and just war theory.

As the center's director, Kim is responsible for promoting the visibility and impact of the humanities at Marquette to campus and the surrounding communities; supporting humanities faculty research and teaching, as well as undergraduate humanities research and scholarship; and securing external funding for humanities work.

The Center for the Advancement of the Humanities, which opened in 2018, was created to improve the public's understanding of the value of the humanities — especially in thinking about complex social issues — by welcoming internationally known speakers; hosting interdisciplinary events, programs and seminars; and celebrating innovative teaching.

A SCHOLAR REMEMBERED

COLLEGE MOURNS THE PASSING OF POLITICAL SCIENCE PROFESSOR DR. JOHN MCADAMS.

The Klingler College community remembers Dr. John McAdams, associate professor of political science, who passed away in April. McAdams was a well-known American politics and public

policy teacher at Marquette for nearly 45 years. A renowned scholar of the assassination of President John F. Kennedy, McAdams taught

a popular course on the topic. He also published the book *JFK Assassination Logic: How to Think about Claims of Conspiracy* in 2011.

"I looked forward to logging on to his class every single day to listen to him speak about the Kennedy assassination," Nina Winkler, a student in the Klingler College who took his class, says. "There was never a day that went by where he wasn't equally as excited to teach his students as we were to learn."

DELIBERATIVE DIALOGUE

BY BRINGING TOGETHER DIVERSE VOICES, A NEW CIVIC DIALOGUES PROGRAM HOPES TO FOSTER RESPECTFUL CONVERSATIONS ABOUT SOCIETY'S MOST PRESSING PROBLEMS.

BY PAULA WHEELER

The 2018 Marquette Forum, *Democracy in Troubled Times*, brought an expert on deliberative democracy to campus amid a hyperpolarized national political climate. As part of the visit, a campuswide deliberation was organized around the issue of immigration. "It went fine," Dr. Amber Wichowsky says, "but it was also pretty clear that we struggled to talk about issues of political conflict."

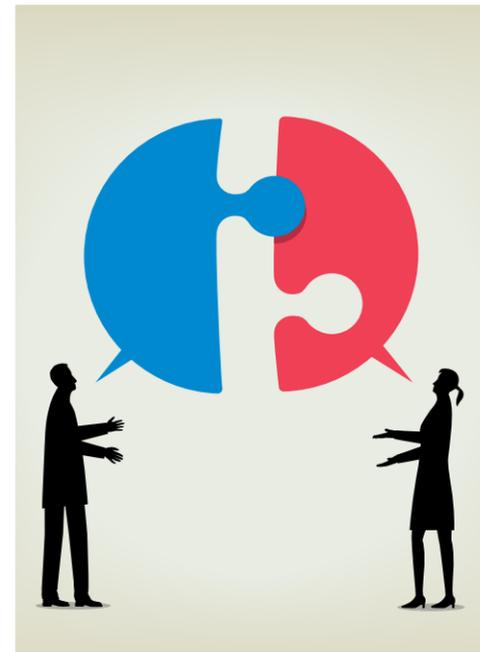
That dialogue kick-started the idea for a multifaceted initiative housed in the Political Science Department to focus on the teaching, practice and study of democratic deliberation.

Wichowsky, associate professor of political science, is directing the newly launched Civic Dialogues program, described as "an interdisciplinary hub drawing faculty, students and community partners together to explore and advance the practice of deliberative and honest exchange about pressing contemporary challenges."

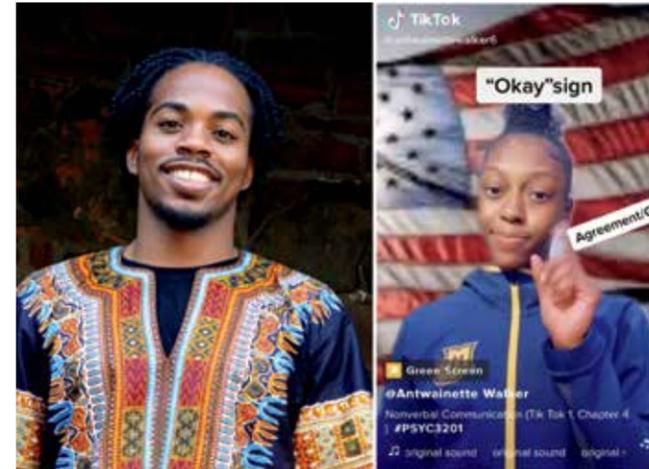
Support among a politically diverse group of donors is funding a two-year pilot of the program, with allocations for a speaker series, a thought-leader-in-residence and high-impact student experiences.

The program aims to establish Marquette as a site of civic dialogue and an advocate for its importance both locally and more broadly, Wichowsky explains. "As a university, we're also very interested in teaching these civic skills to our students — to make arguments, wrestle with evidence, engage in active listening, be able to communicate with one another. These skills are critical for our democracy."

As a Catholic, Jesuit university, Marquette's Ignatian values and pedagogy already align with key concepts important to constructive



civic dialogue, Wichowsky points out. These aspects will be baked into the new program's classes, modules and even research. "In the last year, our country has faced multiple, overlapping crises, laying bare deep social divisions and the need for more effective civic discourse and reasoning. The Jesuits have been quite clear that we must continue working for justice, and that in doing so, we have a responsibility to think about people as individuals with dignity, and to listen, ask questions and engage one another about the common good," she says.



Dr. Simon Howard (left) asked his students, including Antwainette Walker (right), to demonstrate their understanding of social psychology concepts using TikTok videos.

Dr. Simon Howard, assistant professor of psychology, knew teaching would have to look different this past academic year because of limitations brought on by the pandemic. So, he spent considerable time brainstorming about different assignments for his Introductory Social Psychology class that students would find enjoyable, engaging and educational but at the same time be feasible in an online format.

He decided on incorporating something Gen Z would appreciate — TikTok.

TikTok was gaining popularity during the months of lockdown, with its short-form videos showing off users' dancing, singing, meme-making and joke-telling skills. Howard considered how it might be useful for learning social psychology.

He developed a project in which he asked students to create TikToks that demonstrated social psychology theories and concepts, and present them to the class. Discussions followed on the larger societal implications of the theory that they covered in their TikTok. His goal was to create an assignment that fostered both

analytical and critical thinking skills as well as opportunities for creative application.

"One advantage to using TikTok, and other social media, for assignments is that it empowers students to articulate ideas and process concepts in ways that are both meaningful and engaging," Howard says. "It also allows students more freedom to connect and collaborate beyond the physical classroom."

Another advantage to this format, Howard says, is that students actively participate in their own learning rather than passively absorbing information they might forget once they are tested on it. The TikToks allowed students to create and present information in a way that resonates with them and motivates them more than traditional assignments.

Howard also extended his creative teaching assignments to his Psychology of Racism course this past academic year. He asked student teams to create their own original playlists of 12 to 15 songs that explore a theme covered in the course work. Students presented their playlists to the class, explaining the connecting theme, theories and research on the psychology of racism. One group, for example, presented their "Who Am I?" playlist, inspired by Stanford University psychology professor Dr. Hazel Markus' research project of the same title. They discussed how race can be a source of meaning, belonging and motivation, and used lyrics from Solange Knowles and Vince Staples to connect to Markus' work on identity and self.

"When students are given opportunities to demonstrate their understanding and ownership of course material in an interesting way, they seldom disappoint," Howard adds. "Based on the success of these assignments, I will be more likely to experiment with my assignments in future classes."



When students are given opportunities to demonstrate their understanding ... of course material in an interesting way, they seldom disappoint.



DR. SIMON HOWARD

A TURN TO INTERN

ARTHUR VINING DAVIS FOUNDATION GRANT MAKES INTERNSHIP OPPORTUNITIES MORE ACCESSIBLE AND APPEALING.

BY JENNIFER ANDERSON

Internships provide valuable skill-building opportunities but are too often unpaid, making it hard for students to invest time in them.

"It's really a matter of equity and access," says Dr. Andrew Kunz, chair and professor of physics, who is the principal investigator for an Arthur Vining Davis Foundation grant — a two-year gift that is providing 140 students with financial support while they pursue unpaid internships. "For students who are under financial pressure, to ask them to take on an unpaid internship is a hardship."

For Marinella Krezic, Arts '21, who majored in cognitive science and philosophy with a minor in neuroscience, the AVDF grant allowed her to be financially compensated while taking on a prestigious internship at the Center for Bioethics and Medical Humanities at the Medical College of Wisconsin. The center, one of the first of its kind in the nation, was created to nurture a multidisciplinary approach to explore the challenging ethical questions that have arisen amid the scientific advances and changes in the health care delivery system. The MCW internship allows students to engage deeply with the scientific, philosophical and societal issues at stake.

Krezic received three credits for working approximately 140 hours over the course of the internship. Thanks to the AVDF grant, she also received a stipend of \$1,600. "When you're in college, any help you can get is great," she says of the compensation, which she plans on using toward paying off college loans.

During the internship, Krezic participated in grand rounds with physicians and residents, researched how doctors can successfully address vaccine hesitancy and developed content for the center's newsletter. "This was a writing-heavy experience, and it helped me strengthen that skill, which I can transfer to any career," says Krezic.

She also gained a valuable mentor in the center's program director, Kristen Tym, who continues to be a sounding board and adviser. By engaging with Tym and other professionals in the field, the program boosted Krezic's faith in herself. "I am not a person who talks a lot in class, but in this internship, I was really expected to participate," she says. "It helped me to become more confident



Marinella Krezic, Arts '21, interned at MCW's Center for Bioethics and Medical Humanities her senior year, earning a stipend through an Arthur Vining Davis Foundation grant.

in sharing my intellectual abilities with others."

The experience also exposed Krezic to modern bioethical quandaries, giving her an idea of what a potential future career in the field of bioethics might entail, which will help her as she considers graduate education options.

"My courses and this internship were all geared toward the Jesuit principle of *cura personalis*," Krezic says. "It's truly been about learning to care for the whole person."

The AVDF grant also allowed the college to hire Alexis Lockett-Glover as internship coordinator to help students prepare for internships and to teach a Career Ready Internship with Professional Development seminar.

LEAVING A LEGACY

REMEMBERING FATHER DORAN'S CONTRIBUTIONS TO THE WORKS OF PHILOSOPHER BERNARD LONERGAN.

BY LAUREN (HERB) SCHUDSON,
GRAD '97

Rev. Robert "Bob" Doran, S.J., professor of theology and the Emmet Doerr Chair in Theology, passed away in January.

Father Doran, Grad '75, was well known within the Klingler College and the Department of Theology and served as founding director of Marquette's Campus Ministry from 1970 to 1972. He was considered one of the most gifted Catholic theologians in recent times, building



upon the philosophies and theories of Rev. Bernard Lonergan, S.J., a Canadian Jesuit priest, philosopher and theologian whose 1957 book, *Insight: A Study of Human Understanding*, was the basis for Father Doran's dissertation and his later quest to chronicle and champion Lonergan's work.

Since 2006, he served as director of the Marquette Lonergan Project and was the general editor of 25 volumes of the *Collected Works of Bernard Lonergan*, the last of which was published in 2019. Dr. Joseph Ogbonnaya, associate professor of theology, now directs the project.

Father Doran completed his doctorate at Marquette and contributed to Father Lonergan's studies by including psychic conversion with Lonergan's intellectual, moral and religious conversions. Father Lonergan later endorsed his theses as a correct understanding of his thoughts and Father Doran's psychic conversion as an important complement to his works, according to Ogbonnaya.

Dr. Danielle Nussberger, associate professor of theology, says, "In addition to leaving us the legacy of his monumental scholarly achievements, Father Doran modeled for us what it means to teach and minister to others with the utmost humility, generosity and compassion. The indelible impact of his mentorship will be felt for generations to come."

Marquette's unique contributions to the Lonergan enterprise can be found at bernardlonergan.com and lonerganresource.com. Also visit lonergansociety.wordpress.com for the Lonergan Society at Marquette University, a student organization connected with the project.



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Support scholarship at marquette.edu/giveonline or contact Molly Eldridge at 414.288.4497 or mary.eldridge@marquette.edu.

TIME TO RISE

THE MARQUETTE PROMISE TO BE THE DIFFERENCE



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MAKING A PLACE A HOME

LIFE EXPERIENCES INSPIRE DR. SERGIO GONZÁLEZ TO STUDY THE STRIVING OF LATINX PEOPLE TO CREATE SUSTAINABLE COMMUNITIES IN THE MIDWEST.

BY MARTINA IBÁÑEZ-BALDOR, COMM '15

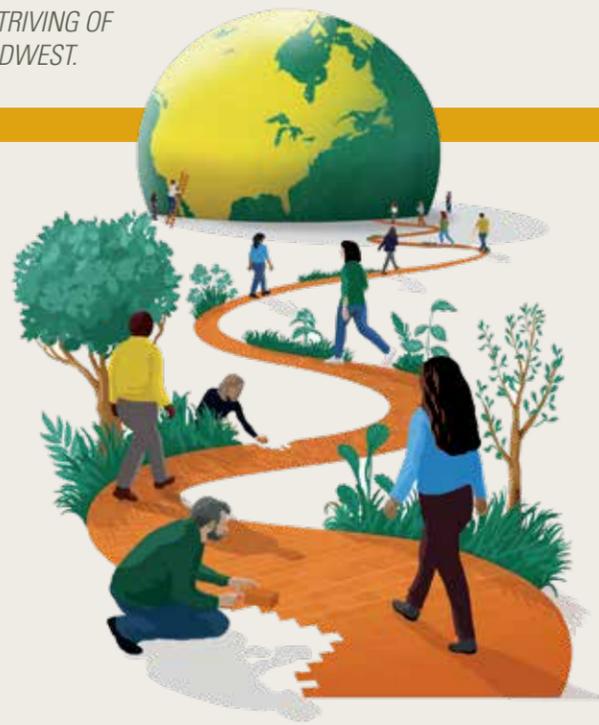
Growing up as a first-generation Mexican American, Dr. Sergio González has always wondered why his family settled in Wisconsin. This curiosity has led to a professional dedication to the study of the development of Latinx communities in the Midwest.

"I wanted to study something that really mattered to me, and I was really interested in how, in spite of what sometimes feels like insurmountable barriers, Latinxs have found ways to not only survive but to thrive," González says. (Latinx is a gender-neutral term.)

González, assistant professor of Latinx studies, is currently collaborating with scholars on an interdisciplinary project, Building Sustainable Worlds: Latinx Placemaking in the Midwest. An Andrew W. Mellon Foundation/Humanities Without Walls-funded project, it examines the significance of Latinx efforts in building socially and economically sustainable communities across the region. Over the last few years, scholars of Midwestern Latinx communities have met at HWW-participating universities to share ideas, interact with community groups and collect research that will culminate in a book to be published next spring through the University of Illinois Press.

For González's part, he wrote a chapter on the 1980s sanctuary movement in the Midwest, studying the ways in which communities provided sanctuary spaces to support Latinxs in crisis, such as Central American refugees fleeing civil war in their countries and those fleeing detention deportation in the U.S. "It became quite clear that it's been very difficult for Latinx communities to build sustainable spaces in the Midwest for a number of different reasons. Oftentimes, it's difficult to not be seen as workers but to be seen as human beings," González says. "This study dives into those complexities but at the same time also highlights the ways in which, in spite of or because of those difficulties, Latinx peoples have created spaces for themselves in this region."

One of the goals of the book is simple: to change the perception of Latinx people in the Midwest. "They are not outsiders, they are not aliens, they are integral members of the communities that they call home," González says. The book



emphasizes that although Latinx communities in the Midwest have certainly faced hardships and difficulties, there are also stories of joy, accomplishment and prosperity.

This past spring semester, González taught a new class that he developed called Midwest Latinx Communities, a part of Marquette's new Latinx Studies program. The class was so popular that it had a waiting list. "Latinx students on campus are hungry to learn more about themselves, their families and their place within this region," González says. "It was the perfect opportunity to take a lot of the work that we've been doing in this [Latinx Placemaking] project and put it into practice."

González was happy to see that students were, without prompting, coming to the same questions that he and his colleagues had been asking as academics. "It's a reminder that the questions we're asking are not highfalutin academic discourse," he says. "They are questions that people are really interested in and matter to them."

PREDICTING PTSD RISKS

A MACHINE-LEARNING ALGORITHM AIMS TO WARN PEER MENTORS BEFORE MILITARY VETERANS ENGAGE IN HARMFUL BEHAVIOR.

BY TRACY STAEDTER

"As data and computer scientists, it's always impactful when you can solve real-world problems rather than working on theoretical issues," says Dr. Praveen Madiraju, associate professor of computer science.

Madiraju is doing that by addressing one of the biggest problems facing military veterans: post-traumatic stress disorder. High levels of PTSD symptoms are associated with an increase in risky behaviors that include alcohol abuse, aggression and violence. In some cases, these symptoms lead to harming others, self-harm and even suicide. About 18 military veterans die by suicide each day, according to the U.S. Department of Veterans Affairs.

A large multidisciplinary team, led by Dr. Iqbal Ahamed, professor and chair of the Department of Computer Science, included Madiraju; Medical College of Wisconsin colleagues Drs. Zeno Franco and Katinka Hooyer; and student researchers. The team developed a new machine-learning algorithm for an app they created a few years ago for the national community-based veteran support organization Dryhootch. ("Hootch" is military jargon for a safe place to sleep during combat.) The app, called Quick Reaction Force, connects Dryhootch clients with peer mentors who monitor a vet's wellness and offer support. Each week over the course of a 12-week program, the app prompts vets to answer questions: Are you feeling good about yourself overall this week? Have you engaged in any risky behavior (as you define it) this week? How stressful has this week been? The answers are converted into scores and trends that the peer mentor uses to better understand the veteran's state of mind and to improve support.

Adding the machine-learning algorithm takes the app to the next level, Madiraju says. It analyzes a person's answers to these questions and then predicts whether the individual is experiencing high, mild or low levels of PTSD symptoms.

"To our knowledge, this study is the first of its kind to include the high-risk category to differentiate individuals with high PTSD symptoms," the team writes in a research paper presented at the 2020 IEEE 21st International Conference on Information Reuse and Integration for Data Science.

Previous analysis, they say, has taken a broad, either-or approach, categorizing individuals as being "at risk" or "not at risk."

Madiraju says that the extra layer of machine learning will aid early intervention by alerting the Quick Reaction Force app on the mentor's phone that a veteran's answers have crossed the high-risk threshold. Although the machine-learning algorithm has not yet been tested with Dryhootch clients, lab-based analysis indicates that the algorithm was able to make accurate predictions as early in the program as week four.

Otis Winstead, executive director of Great Lakes Dryhootch, sees the app and its ability to flag high-risk



individuals as an important component of healing. He's found that because there isn't a paper trail, mobile apps allow veterans to open up and make themselves more vulnerable. Mentors can engage with their mentees in meaningful ways, having text-based conversations that may occur in short bursts over several days, instead of happening once per week for an hour, as in therapy sessions.

"You build trust," he says.

THE STORIES THAT WE TELL OURSELVES — AND OTHERS

DUELING NARRATIVES ABOUT RACE AFFECT OUR UNDERSTANDING OF WHAT IT MEANS TO BE BLACK IN AMERICA.

BY LORA STRUM

For years, whiteness has been the lens through which we see the world, says Dr. Cedric Burrows, associate professor of English and author of *Rhetorical Crossover: The Black Presence in White Culture*. There's music, and then there's urban music. There's film, and then there's Black films. There's history, and then there's Black history.

"Cultures that aren't white are considered niche," Burrows explains. "Learning about them is something you can do if you want, but it's usually seen as an elective."

Exposing the many ways Black culture is unique was critical to *Rhetorical Crossover's* key effect: to examine music, education, film and social movements to argue that elements of Blackness are reinterpreted into acceptable narratives for predominately white audiences.

These narratives affect everything society does, including how it fights for racial justice, Burrows adds. He references a video he found on social media shortly after a white supremacist drove a car into a group of anti-racist protesters in Charlottesville, Virginia. In the post, a Black man is engaged in a physical altercation with a known white Klansman. The posted comments denounced the Black man's emotions, calling him violent and a detriment to racial justice efforts. The idea that a Black person must express anger peacefully is codified into America's acceptance of Blackness, Burrows says. It happened again during the summer of 2020 when the media criticized Black Lives Matter activists for perceived acts of violence during protests.

"When Black people express natural emotions, it is often considered threatening," Burrows states. "What is missing when judging the emotions are the events that led up to the response."

Changing the way we understand Blackness is critical to Burrows' work in the classroom, where he leads instruction in rhetoric and analysis. Burrows — who was recognized this spring alongside Dr. Lilly Campbell, assistant professor of English, as Marquette



Dr. Cedric Burrows received the 2021 National Council of Teachers of English David H. Russell Distinguished Research Award for his book, *Rhetorical Crossover*. The award recognizes commitment and dedication to advancing literacy or the field of education.

Difference Makers for redesigning an English course to focus on racial injustice and anti-racism — makes it his mission to immerse his students in the world that shaped the authors of the texts they're reading. Many students tell Burrows that, before his class, they had gone their entire academic lives without understanding how Malcolm X used persuasion in his speeches or how lynchings influenced Ida B. Wells' writings.

The importance of historical context first became apparent to Burrows during his childhood in Memphis, Tennessee. Burrows recalls encountering a cognitive dissonance when his textbooks decried how marginalized and miserable the Black community was during the Jim Crow era, yet family members and Black residents revealed to him how vibrant the Black community was at that time.

"Blackness is not always about victimization," Burrows says. "It's also about resistance and reaffirmation."

Today, when considering how America's understanding of Blackness is changing, Burrows recalls the lexicon we have for non-whiteness. "When I was born, I was black, then African American and now Black with a capital B. I was a minority, then a person of color and finally an underrepresented group," he says. "How we perceive Blackness always influences how I see the world, and how I see me."

ADAPTING TO SURVIVE

DR. LISA PETRELLA STUDIES HOW INTENTIONAL CELL DEATH MAY HELP AN ORGANISM ENDURE THE STRESSORS OF CLIMATE CHANGE.

BY SARAH KOZIOL, ARTS '92

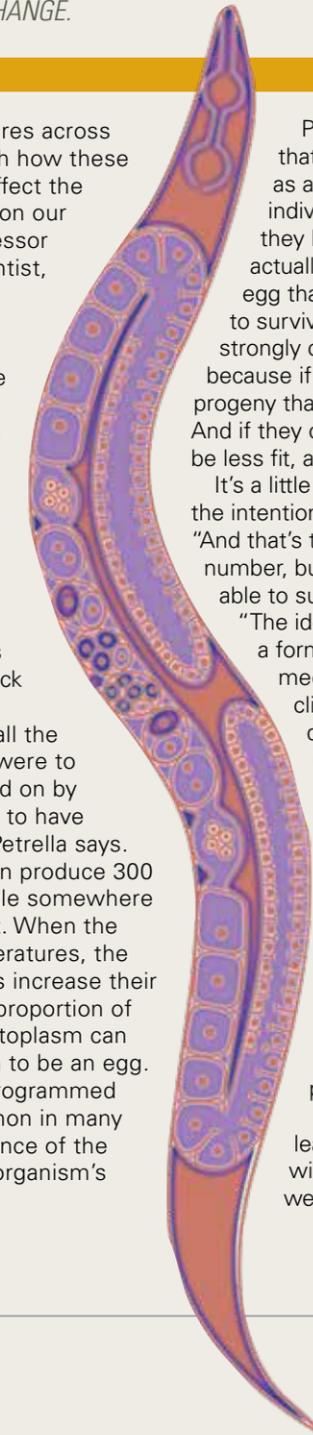
As climate change increases temperatures across the globe, scientists are concerned with how these increases, no matter how slight, may affect the populations of vital organisms that live on our planet. Dr. Lisa Petrella, associate professor of biological sciences, is one such scientist, and she's now armed with a \$459,000 National Institutes of Health grant to investigate how species regulate their reproductive processes when under the environmental stress of higher temps.

Petrella is studying *C. elegans*, a soil-inhabiting, transparent, 1-millimeter-long worm whose rapid reproduction can be observed under a microscope.



Tiny and seemingly inconsequential, the worm has fundamental importance in the ecosystem: "The worms help recycle nutrients back into the soil, which helps plants. If we were to lose all the lower invertebrates, or if we were to lose all the insects — things that are fed on by all the higher organisms — we're going to have massive disruptions in the food web," Petrella says.

Under ideal conditions, *C. elegans* can produce 300 offspring in three days, but it goes sterile somewhere between 78 and 80 degrees Fahrenheit. When the female experiences these higher temperatures, the research team has observed the worms increase their cell production and then kill off a large proportion of those cells so that their nutrient-rich cytoplasm can be donated to the one cell that goes on to be an egg. The process is called apoptosis — or programmed cell death. It's a cellular function, common in many species, that in this case is a consequence of the environmental stress and ensures the organism's remaining eggs are of high quality.



Petrella is hypothesizing that in the species that adapt in this way, the apoptosis acts as a defensive shield against extinction. "If individual females increase how many cells they kill off when they're stressed, that's actually protective because they are making this egg that has to be an embryo even more robust to survive," she says. "We think that is going to strongly correlate with how many cells are killed off, because if they kill off more cells, they'll actually have progeny that can survive in this harsh environment. And if they can't up that cell death, their progeny will be less fit, and then they won't survive the stress."

It's a little counterintuitive, Petrella admits, because the intentional cell death does result in fewer offspring. "And that's true. You will probably have fewer by number, but we are hypothesizing these will be better able to survive in that stressful situation." She adds, "The idea is, that if organisms can do that, that's a form of adaptation that could be a potential mechanism where populations could survive climate change — if they're able to keep doing that over generations." The interaction of fertility, temperature and cell death hasn't been widely studied, according to Petrella, and what the role cell death has in keeping females fertile has not been tested that sensitively. She believes her novel research is crucial to understanding if other species beyond *C. elegans*, including mammals, can survive the stress of climate change. The three-year project is underway but still in its early stages. Petrella, who equates research to "a never-ending puzzle box," knows this project might not turn out as expected. "You start asking a question and then it leads you in new directions. So, I'm sure this will lead me in some new directions. I think we're too early to know just where yet."

THE VERDICT IS IN

SOCIAL SCIENTISTS' RESEARCH EXPOSES THE LIMITED ROLE FORENSIC EVIDENCE PLAYS IN SEXUAL ASSAULT ADJUDICATION.

BY CLAIRE CURRY

Since 2010, Drs. Heather Hlavka and Sameena Mulla reported to the Milwaukee County Courts to research the role forensic science plays in sexual assault trials. After analyzing more than 600 hearings and trials, their findings revealed that forensic evidence — fingerprints, hairs and fibers, blood and other bodily fluids, analyzed for DNA — rarely determines a defendant's guilt or innocence, yet it often reinforces old stereotypes of sexual violence.

The public perception of forensic evidence and the influence such evidence has on the outcome of sexual assault cases contribute to what socio-legal scholars call the "CSI effect." In the popular courtroom television drama, it's often the last, crucial piece of evidence that solves a case. In reality, however, forensic evidence is either unreliable or not found at all. In fact, of the 680 hearings the researchers analyzed, 34 cases went to full trials and only seven of those showed documented injuries during the forensic examination; just five contained DNA identification.

Hlavka, associate professor of social and cultural sciences, and Mulla, now a faculty member at Emory University, detailed these findings and other revelatory themes in sexual assault cases in their book *Bodies in Evidence: Race, Gender and Science in Sexual Assault Adjudication*.

"The public generally believes that when you have that kind of evidence, it's going to resolve a question of guilt or innocence, and what you see is that it doesn't," Hlavka says. "The prosecution always assumes that the jury members are like, 'Where's the DNA evidence?'"

For that reason, prosecutors feel the need to address the absence of evidence. Those disclosures, Hlavka and Mulla argue, raise credibility questions and reinforce myths about rape in the courtroom. The notions that victims are lying or to blame because of what they were wearing, for example, are cultural constructs that

have been challenged in courts since the 1970s. Although the old law that required corroborative evidence for sexual assault cases has since been removed, forensic evidence is often used to uphold such stereotypes, Hlavka says.

In their book, the researchers also explore how racial discrimination influences court proceedings, creating inequality in sentencing. They found that Black women who testified were often assumed to be "sex workers," while children of color were perceived as less innocent and more blameworthy for their assaults than white children.

To that end, in 2017, Hlavka and Mulla co-authored the paper "Intersectionality and Credibility in Child Sexual Assault Trials" with their former student Amber Joy Powell, Arts '14, now a doctoral candidate at the University of Minnesota. In the paper they posit that attorneys' strategies for approaching children's sexual assault cases emphasize lack of evidence and narratives that purvey racial stereotypes.

"It is disproportionately Black and brown children who are overly sexualized and named as responsible for the harms that have befallen them," Mulla says. "That tracks with the broader literature that shows we tend to deny the childhood particularly of Black boys and Black girls."

Through their analysis of sexual assault adjudication in the 21st century, Hlavka emphasized that technological advancements in forensic science have created a new vulnerability for victims and that racialization is woven into every facet of the legal process. "I hope that readers find the humanity in our work and in the testimonies provided and continue to question the imaginary of scientific evidence not only in courtrooms but in many other sectors of social life and reconsider the seduction of forensics and objectivity over lived experience and knowledge."



People make social comparisons starting at a young age: Who's stronger? Who's faster? Who gets better grades?

These questions continue throughout life and arise unconsciously, according to Dr. Amber Wichowsky, associate professor of political science. Wichowsky wanted

to learn how social comparisons across the economic divide — Who's richer or poorer? — affect how Americans consider economic and societal inequality.

She and Dr. Meghan Condon, an assistant professor of political science at Loyola University Chicago, surveyed thousands of Americans to figure out how people compare one another socially and whether those comparisons have consequences.

As part of these surveys, Wichowsky and Condon randomly assigned participants to think about the country's richest people or the poorest. Then, they asked participants to imagine a conversation with someone in that group. How did the conversation make them feel? Would this person change how they felt about social policies, such as food assistance, aid for college students or unemployment insurance? When people thought about conversations with those at the top, Wichowsky and Condon discovered that participants' sense of status fell, and they wanted government to do more to address inequality.

"In the U.S., incomes of the highest earners, the top 1 percent, have really increased," Wichowsky says. "By asking people to engage in social comparison with those at the top, it made people more accurate about their own socioeconomic position. And it increased their support for egalitarian policies."

This experiment became the first of many for Wichowsky and Condon's book, *The Economic Other: Inequality in the American Political Imagination*. The book won the 2021 Juliette

THE ECONOMIC OTHER

POLITICAL SCIENCE PROFESSOR RESEARCHES HOW AMERICANS CONSIDER AND RESPOND TO ECONOMIC INEQUALITIES.

BY HAL CONICK

and Alexander L. George Outstanding Political Psychology Book Award from the International Society of Political Psychology.

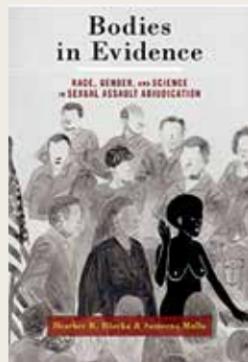
"The book begins with a fact: Over the course of my lifetime, economic inequality has grown between the very rich and the rest of Americans," Wichowsky says. "At the same time, contrary to some dominant economic and political theories, we haven't seen a strong rise in public demand for economic redistribution."

The book examines why inequality and public demand for solutions have often diverged. One reason, Wichowsky says, is most Americans don't encounter the wealthy elite in their day-to-day lives. While the residential segregation of the poor remains stubbornly high, it's actually the segregation of affluence that has grown the most in recent decades, Wichowsky notes.

But the divergence often goes deeper. For example, more people are now economically insecure and anxious, she says, which makes it much less pleasant to think about social and economic status at all. Thus, many simply ignore the issue entirely, as they search for a better life for themselves. "We tend to think that Americans are ignorant about or tolerate large economic differences. However, our research shows Americans are concerned about inequality when they are confronted with it, and they want government to do more to expand economic opportunity and encourage more inclusive growth," Wichowsky explains. Nevertheless, Wichowsky and Condon also show that many Americans feel politically powerless in the face of large and growing economic divides.

In the book's conclusion, which Wichowsky says will likely turn into another book, the duo imagines how people can come together. "We're very much interested in the questions of solidarity," she says. "What do we owe one another? How can we feel empathy, care and concern for one another? How do individuals and groups engage politics to build a more inclusive economy?"

Books aren't the only results of Wichowsky's studies on inequality. She also runs the Marquette Democracy Lab, which looks at ways to bring students, faculty and community partners together to study ways to strengthen civic engagement.



Bodies in Evidence: Race, Gender and Science in Sexual Assault Adjudication is available on Amazon.



Transformative Teaching

The Education Preparedness Program is revealing its great promise — shaping future leaders to better understand the effects of incarceration and providing a prison-to-college pathway through academic opportunities and community partnerships.

By Diane M. Bacha

In the spring of his junior year at Marquette, Dan Brophy, Arts '20, then a student government leader pursuing majors in philosophy and political science, learned about an intriguing philosophy class focused on mass incarceration. His classmates would be a mix of students from Marquette — people pretty much like him, typically from Midwestern middle-class suburbs — and students from a local community college who had once been incarcerated.

He signed up, thinking this would be unlike any other class he had taken. Turns out, he underestimated that expectation. “I came in one person,” Brophy now says of the experience, “and came out a completely different person, both as a student and as a human being.”

“It was a huge experience in humanization and in understanding other individuals and perspectives that I’ve just never understood before.”

—DAN BROPHY, ARTS '20

Pictured left to right: Shar-Ron Buie, community liaison, EPP; Dr. Darren Wheelock, associate professor, criminology and law studies; Dr. Theresa Tobin, associate dean, Graduate School; Mahmood Watkins, co-instructor, EPP; Marisola Xhelili Ciaccio, associate director, EPP; Dr. Robert Smith, Harry G. John Professor of History and director, CURTO



It’s not an uncommon reaction among those involved with Marquette’s “blended classes,” which since 2015 have brought students from currently and formerly incarcerated communities (CFI) together with Marquette students for thought-provoking and often difficult discussions about mass incarceration. These classes are now part of a larger

prison-to-education effort with big ambitions: reverse entrenched inequities in the carceral system by providing a network of educational resources, community partnerships and courses for both traditional students and those currently or formerly incarcerated. Called the Education Preparedness Program, or EPP, it’s envisioned as “the centerpiece of a citywide prison-to-college pipeline,” says Dr. Robert Smith, Harry G. John Professor of History and director of Marquette’s Center for Urban Research, Teaching and Outreach (CURTO), which is hosting the program. EPP picked up significant momentum

in late 2020 when it received a \$745,000 grant from The Andrew W. Mellon Foundation.

The team behind EPP sees this effort as a natural extension of Marquette’s Jesuit mission. It promises to transform Marquette’s impact on Milwaukee and potentially transform the way future leaders think about the carceral system.

As Brophy’s story attests, that transformation starts at the personal level. The blended-class experience forced Brophy to look at his privilege more closely and upended his perceptions of the criminal legal system. He’s now pursuing a career in public policy with a particular interest in social justice and incarceration; he sees a law degree in his future. “When we talk about that course, anybody from that course, the words you’ll hear come up a lot are ‘humanity’ and ‘humanizing,’” Brophy says. “And that’s really what it was. It was a huge experience in humanization and in understanding other individuals and perspectives that I’ve just never understood before.”

This is by design, say the course instructors. While conversations about mass incarceration can happen in many settings, “Higher education has an opportunity to bring people together who don’t typically interact,” says Dr. Theresa Tobin, Arts ’97, associate dean of student development for the Graduate School. Along with graduate students Marisola Xhelili Ciaccio and Drew Dumaine, and colleagues from the University Honors Program, Tobin launched the blended classes and continues to co-instruct them. “We’re able to have a space together to grapple with who we are, how we live, what that means, how we dehumanize each other — and really be able to see things in new ways.”

This happens through intentional efforts to create a respectful, intimate and thoughtful environment sometimes found on campus, other times at various participating institutions. Class sizes are small, split roughly half and half between Marquette and CFI students. Classes are discussion-based and informal. Snacks are brought in. No one is asked to share personal experiences, but when they do, they are given uninterrupted time to talk.

In the class with Brophy was Mahmood Watkins, a formerly incarcerated individual then studying at Milwaukee Area Technical College, which has an established program for CFI students. He remembers the relief he felt when, after a few sessions, he realized, “I don’t have to shrink from having experienced incarceration. I don’t have to shrink from being African

American. I can just come and be me, and be respected as so. And let the issues talk for themselves.”

Watkins’ candor made an impact on Devin McCowan, Arts ’20, a Marquette junior at the time. Raised in St. Louis, McCowan became determined to study law when, as a teenager, he observed the protests and unrest touched off after the fatal police shooting of a Black teenager in neighboring Ferguson, Missouri. He has formerly incarcerated individuals in his family, a distinction that, he points out, made him unique among his Marquette peers. Yet when he began the blended class, he knew he had his own biases about incarceration. He found it invaluable to “be inside the minds of formerly incarcerated individuals in a way I was never able to experience before or really have since.”

Hearing their stories firmed his resolve. Today McCowan is studying law at New York University and plans to be a public defender. “When I look at the people I’m going to be defending, I think of the people I was in class with,” he says. He remembers their stories, sometimes told through tears, of enduring solitary confinement, navigating prison hierarchies, trying to find work after reentering the community. “I don’t want to force someone to be devalued that way. I’m going to fight more fiercely because I know from the people I talked to and the friends I made in that class that this is something no one should go through.”

Milwaukee’s mass incarceration challenges have been well-documented. The 53206 ZIP code — separated by just one ZIP code from Marquette — has been cited as the “most incarcerated” ZIP in the state and, by some measures, the nation. This wasn’t going unnoticed in the Marquette academic community. While Tobin and Xhelili Ciaccio were building support for the blended courses, others were discussing ways to involve Marquette in a community-wide effort to address the inequities facing Milwaukee’s CFI population.

This included Dr. Darren Wheelock, associate professor of criminology and law studies and a sociologist focused on the criminal justice system. Well-versed in the sobering statistics about incarceration and reentry rates for communities of color, Wheelock had been in discussions about bringing an existing prison-to-education model to Marquette. Smith had been interested in addressing carceral challenges

before arriving at Marquette to direct CURTO. The two started working together, envisioning CURTO tapping campus and community resources to deliver services such as tutoring and counseling. When they learned about the blended classes, it didn’t take long to connect the dots. The two approaches — humanities-based classroom experiences and “wraparound” support services — came together. Xhelili Ciaccio, Tobin, Smith and Wheelock constitute the core EPP team.

The concept behind EPP is twofold. Marquette will offer a humanities-based curriculum for CFI students as part of a regional consortium of academic institutions, with credits transferable among them. An educational readiness hub, hosted at CURTO, will use both campus and community resources to fill gaps in the CFI students’ education and daily lives. “It’ll take some time,” says Smith, “but we have an opportunity to create a model here in Milwaukee that will be an ideal example of how to build a successful prison-to-college pipeline.”

The blended classes, meanwhile, have evolved into something unique to Marquette, now with “blended instruction.” Those touched by incarceration in some way — justice-impacted people — are invited to plan and facilitate classes. Watkins is now a co-instructor whose reading list, “writings from and about the inside,” includes works by Nelson Mandela, Nikki Giovanni, Primo Levi, The Roots and a friend whose essay about the carceral experience has become “a fixture of the class,” according to Xhelili Ciaccio.

“If I were to encapsulate all of it,” says Xhelili Ciaccio, commenting on both the classes and the larger program, “it’s about transforming punitive practices into healing practices.”

Watkins sees in the blended classes a powerful opportunity to do just that by moving conversations about the carceral system into new spaces.

“It’s freedom-affirming to see more returning citizens participate in these classes. The conversations we once had amongst ourselves, we now have in the halls of academia, with the privileged class. And it is respected,” he says. He’s eager to watch today’s students make a difference in years to come. “The conversation has got to start somewhere. Why not in the halls of academia? Why not with people who were formerly incarcerated? Because those who are closest to the problem are closest to the solution.”

“It’s about transforming punitive practices into healing practices.”

MARISOLA XHELILI CACCIO, EPP ASSOCIATE DIRECTOR AND DOCTORAL STUDENT

IN A NEW LIGHT

As the newest member of the Humanities Without Walls consortium, the Klingler College reimagines how the humanities and those who graduate from its disciplines influence the greater good.

By Lauren Sieben

It might have seemed like a career departure when English doctoral student Amanda Zastrow tackled a fellowship in Marquette's Office of Research and Innovation, the department tasked with advancing the university's research and innovation initiatives. Yet the literature scholar settled into her assignments, creating an undergraduate research website and developing materials to promote the 707 Hub's offerings.

Zastrow found the shift "impactful," but the fellowship had greater intentions: "It brought to my attention the ways in which the skills I already have, due to my humanities training, can be used in a variety of fields that aren't necessarily humanities-based," she says.

Zastrow, who is considering careers in and out of academia, spent three weeks this summer in another fellowship; this one offered speakers from diverse career fields, resume-writing workshops and exploration of career resources.

"This fellowship stressed that as humanities students we already possess so many wonderful skills that will aid us in almost any job we might be interested in — that we have what it takes already," Zastrow says. "We can do so much with a Ph.D. in the humanities, and that was really refreshing to hear."

Data from the American Academy of Arts and Sciences indicates that humanities doctorates are less likely to have secured a full-time job or postdoctoral position upon graduation compared with doctoral graduates in other fields. And with a declining number of

tenure-track faculty jobs available, many doctoral candidates are interested in exploring other paths.

"Fifty percent of Ph.D.s who graduate end up in careers outside of the academy," says Margaret Nettesheim Hoffmann, Grad '13, a history doctoral student and associate director of career diversity for Humanities Without Walls at Marquette. "It's just not something that we talk about, because there's been this cultural norm that the only 'real' outcome is to get a tenure-track position."

A laser focus on faculty positions for doctoral graduates has persisted for decades, says Dr. Theresa Tobin, Arts '97, associate dean of student development for the Graduate School, and while the Klingler College encourages academic careers, it is now intentionally providing tools to graduate students to consider futures in other professions as well.

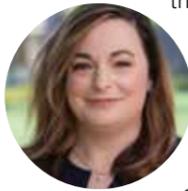
"Nobody ever talked to me about what I might want to do with a Ph.D. in philosophy. It was part of the culture that you would try to find a job as a full-time professor," Tobin says. "The work we're doing at Marquette is intended to support students better in discerning and training for careers open to them and to be honest and intentional about the fact that not all students pursue or get academic jobs or necessarily want them."

Expanding opportunities for humanities students

In 2018 Nettesheim Hoffmann worked with Tobin and Dr. Doug Woods, dean of the Graduate School, to

coordinate a career symposium, panel discussion and weeklong career diversity boot camp for graduate students across campus.

The events have allowed graduate students to hear from doctoral graduates in nonacademic jobs, learn how to translate their skills into resumes and cover letters, and go on site visits to employers including Northwestern Mutual and the Social Security Administration.



Nettesheim Hoffmann (left) was inspired to coordinate the events after being selected as a fellow for Humanities Without Walls, a consortium of universities that fosters collaborative research and explores the contributions of humanities in the world. In 2017 she attended HWW's three-week intensive summer workshop focused on career diversity in the humanities. Afterward, she set out to bring what she learned back to Marquette.

"It was a transformative moment in my life because it wasn't just about me. It was: How can I bring these tools to my colleagues at Marquette?" she says. At the time, "There was no real structured programming at Marquette to help Ph.D. students think about their career development."

HWW leadership took notice of Nettesheim Hoffmann's work. In 2020 Marquette became the first university added to the consortium since 2014 and was awarded a \$1.3 million subaward of HWW's \$5 million renewal grant from The Andrew W. Mellon Foundation. Now, Marquette gets "a seat at the table to be a part of these conversations that are trying to reimagine what the humanities Ph.D. means, not just at our universities but in American society," Nettesheim Hoffmann says.

The Mellon grant supported Zastrow's summer HWW Predoctoral Career Diversity Fellowship. It's also providing research funding opportunities: Humanities faculty and students at Marquette can apply for HWW grants to support humanities-led collaborative research, which can have a ripple effect that reaches beyond campus, Tobin says. Past HWW-funded research projects at other consortium-partner universities have tackled societal challenges including food ethics, climate change and health care.

"We know at the heart of all of these challenges lie the basic questions of who we are and how we should live. For that reason, the humanities and broad liberal arts are crucial to addressing grand challenges."

Dr. Heidi Bostic

"It's spearheading interdisciplinary, cross-consortium and cross-community partnerships that expand narratives about what graduate education in the humanities at Marquette is for, what it can do and why it matters," says Tobin, who served as a co-principal investigator on the HWW subaward alongside Nettesheim Hoffmann and Dr. Timothy McMahon, associate professor of history.

"Sometimes there is an assumption that various serious challenges we face in the world — the coronavirus pandemic, new technologies, racial disparities, or disruptions in the nitrogen or phosphorous cycle of the Earth — are simply technical or scientific issues," says Dr. Heidi Bostic, dean of the Klingler College. "Yet, we know at the heart of all of these challenges lie the basic questions of who we are and how we should live. For that reason, the humanities and broad liberal arts are crucial to addressing grand challenges."

From side project to career focus

Philosophy doctoral student Marisola Xhelili Ciaccio, who attended the first HWW career diversity events at Marquette, has been forging her own path in academia ever since her undergraduate years.

"As an immigrant and first-generation college student, I struggled with imagining an authentic future for myself in academic philosophy," she says. "I felt an alienation from what I wanted to study, how I wanted to study it and the things that moved me internally."

A typical doctoral program is often tightly framed around course work that doesn't leave room for students to apply humanities principles in practical ways, Xhelili Ciaccio says. So in 2015, she started working on a project to teach blended courses to both incarcerated students and Marquette students. Three years later when she attended one of the career diversity symposiums, Xhelili Ciaccio began to see how she could grow that project into something bigger.

"I started thinking about it as a career possibility for the first time after attending these workshops and hearing that it wouldn't be a failure to redirect myself to do the work that I have already been passionately doing, as opposed to seeing it as a side thing," she says.

The project was recently folded into the Education Preparedness Program, a new Mellon-funded Marquette initiative that supports students affected by incarceration, and Xhelili Ciaccio now serves as the program's associate director (see related story on p. 14).

"I get to be part of a team that shapes that vision, which is so exciting," Xhelili Ciaccio says. "It didn't start out that big. It started out as a class."

Career diversity events have also fostered collaborations between graduate students. At the first boot camp Nettesheim Hoffmann organized, a master's nursing student and a doctoral candidate in history became inspired to create a new history class for nursing undergraduates that explains the history of racial segregation in Milwaukee and the ways institutionalized racism affects patient care.

"That came about because of the boot camp," Nettesheim Hoffmann says. "They had a chance to tear down those disciplinary silos and recognize that history can really inform the work that we do in our nursing courses."

Another student with a master's in Spanish uncovered an unexpected career path after attending a site visit to the Social Security Administration office. During the visit, she learned about job opportunities in

government for people with advanced language skills. A few months later, she landed a job with the Social Security Administration.

"She told us she would have never applied or realized that career path was open to her without having that experience," Nettesheim Hoffmann says.

For Nettesheim Hoffmann, spearheading career diversity efforts at Marquette has shaped her own professional plans.

"Having this experience and support from our dean and our faculty members saying, 'OK, Maggie, here's the money, go run with this and see what you can do' — that really empowered me," she says.

Nettesheim Hoffmann says she might pursue a career in higher education administration, but she knows for certain she's not planning to become a tenure-track professor.

"At HWW we often say we're career agnostics," she says. "We don't really care [what you do] so long as you find something that's energizing and makes you feel as if you're contributing something to the world."

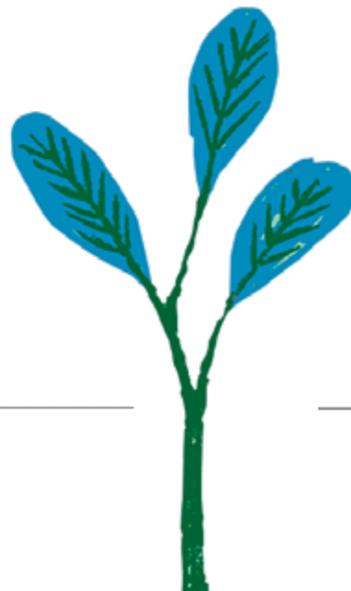
Faculty are "plugging in"

Aside from boot camps and events tailored to students, humanities faculty across departments are also working to integrate career diversity and preparation in their own curricula and course work.

In the doctoral programs for English, history, philosophy and religious studies, career diversity internships and fellowships supported by the Graduate School offer practical work experience beyond traditional research assistantships. University leaders are also in conversation about potential changes to the structure of humanities doctoral programs.

For now, the momentum among faculty — and from the growth of initiatives like Humanities Without Walls at Marquette — is promising, Tobin says. But it's just the beginning.

"We need Ph.D.-level humanities training in many places in society, including higher education and also in government, law, business and community," she says. "We are working to support students in exploring career options that are meaningful to them and help them develop skills to pursue those, whatever they may be," she says.



PUTTING DOWN ROOTS

The Klingler College cultivates faculty strength in ecology and research while establishing its new environmental science program.

By John Blum

From tropical rain forests to temperate forests to prairie grasslands, Klingler College ecology and evolutionary biology faculty travel near and far to understand the complex interrelationships between living organisms and their physical environments.

Over the last decade at Marquette, there's been a steady drumbeat of interest in all types of academic investigations into the environment. A critical mass of student interest, for instance, led to the creation of an interdisciplinary environmental studies major, one that examines political, social, economic and ethical dimensions of environmental issues.

Taking care of the environment "is really important for the Jesuit mission," Schnitzer reminds us.

That student interest, together with several relatively recent faculty hires in the Department of Biological Sciences, led the university to approve an environmental sciences major for fall 2021, a STEM-intensive program that includes course work in biology, chemistry, physics, math, statistics and data sciences, with elective crossovers to environmental engineering.

These developments, alongside an expanding portfolio of faculty research, signal the Klingler College is making its mark in a field grappling with the health and survival of our environment.



At a National Science Foundation-funded ecological research site in the Cascade mountains of Oregon, Marquette biology students map and measure trees in old-growth forests to determine what factors — such as microclimate, soil chemistry and topography — influence survival and growth rates.

One of the college's noteworthy hires, Dr. Stefan Schnitzer, Mellon Distinguished Professor of Biological Sciences, studies lianas — woody vines that weave serpent-like through tropical rain forests. Long intrigued by these plants, he has received National Science Foundation and other external support to study them since 2006 and was recently awarded another NSF grant to continue his studies to 2025.

Lianas climb the trunks of their host trees to deploy their leaves above the canopy to gather light. Until recently, lianas were relatively ignored by the scientific community, always playing the backup singers to the rock star rain forest trees. Schnitzer has changed all that.

His previous work, which garnered national attention, has shown how lianas actually diminish the tropical rain forest's ability to store carbon. The thinner-stemmed lianas store much less carbon than trees — most of the

a huge effect." Although they may be detrimental when it comes to storing carbon, they are beneficial in many ways, including providing passage for arboreal animals, supporting large pollinator populations and promoting tree diversity.

In fact, Schnitzer's recent NSF grant will allow him to test the notion that the lianas maintain this tree diversity by suppressing the growth of dominant tree species, which better tolerate shade, to allow for the survival and coexistence of diverse, more light-oriented subordinate trees.

At his Panamanian experiment site, Schnitzer has set up equally sized plots where he has removed all the lianas, which he can then compare with an equivalent number of control plots that still retain their lianas. The site comprises about 30,000 trees and 300 different species, giving him ample opportunities to

compare changes in tree density richness, diversity and composition with and without lianas. At a nearby 124-acre observation site, the Schnitzer Lab has been tracking the fates of 67,500 lianas since 2007. Having spent the last two years updating the census, Schnitzer feels that the data are now finally refined enough that his team can soon publish findings about those changes to the lianas over the last 10-plus years.

Schnitzer's lianas ecological work looks to answer questions in two broad areas. First, what explains species coexistence, and what mechanisms allow for diversity to be maintained? "Are there specific mechanisms that produce these diverse communities, or is it just random drift — species come, species go?" Second, what explains the distribution of organisms? Is it biotic interactions — the interplay among the living creatures in an ecosystem such as animals, plants and bacteria? Or is there an alignment with abiotic factors, such as different combinations of water, soil nutrients and sunlight?

lianas' biomass resides in its leaves, not wood, and wood stores more carbon for a much longer time. If not as much carbon is being sequestered, climate change may accelerate because these tropical forests currently store 25 to 30 percent of the Earth's carbon.

An infestation of lianas would compound this problem, and that's what has been occurring in tropical forests around the world. Schnitzer's field sites in Panama have jumped from 32 percent infested in 1968 to 75 percent infested in 2007. Scientists aren't yet sure exactly what is causing the infestation — drought, disturbance, elevated CO₂ and nitrogen deposition are possible culprits — but Schnitzer has been studying this for a while and anticipates results in the near future.

The liana story, however, is not all doom and gloom. "When people read the results of my work, some cry out 'Kill all the lianas,' but that's not my message," says Schnitzer. "Compared to previous opinions about the insignificance of the lianas, we're finding that they have

Over the last decade, there's been a steady drumbeat of interest in all types of academic investigations into the environment.

This summer Schnitzer received a prestigious Fulbright Scholar Award. The award will allow him to spend time at Wageningen University in the Netherlands, where he and his colleagues will combine efforts to understand how the tropical forests might be reaching a tipping point in transitioning from being tree-dominated to liana-dominated — especially in terms of species diversity and carbon loss — and its potentially harmful impact on climate change.

Fire's effects on plant-pollinator interactions

Dr. Joseph LaManna, assistant professor of biological sciences, tackles problems complementary to Schnitzer's work. But whereas Schnitzer has been navigating the tropical rain forests, LaManna has been hiking among the temperate forests.

LaManna sees "two fronts" to his ecological research: biodiversity and carbon sequestration. He looks at how species interact and form communities across food-chain levels: from microbes in the soil to plants and trees, insects, birds and mammals. And in his research into forest ecosystem dynamics, he's interested in how species' interactions influence the amount of carbon stored in a forest and how quickly that forest carbon is turning over.

His research methodologies range from experiments and observational studies in the field to powerful quantitative analyses that allow him to crunch the numbers of extremely large data sets. His analytics on the Monitoring Avian Productivity and Survival data set — which provided data for nearly 300,000 individual birds over 16 years from more than 500 bird-banding stations — were instrumental in understanding how West Nile virus affected different bird species. And his work with the data supplied by the Smithsonian Center for Tropical Science Forest Global Earth Observatory helped to understand how predators, pathogens and parasites maintain biodiversity by limiting abundances of dominant species.

He recently teamed up with other scientists to research the effect that western wildfires have had on plant-pollinator interactions. Those results showed that the right kind of fires — those of mixed intensity, not the "scorched earth," high-intensity fires — can result in greater abundances of both plants and pollinators. Findings like these are being used to establish best land-management practices, such as controlled burns.



(Top) Dr. Nathan Lemoine's lab manager, Michelle Budny, downloads data from data loggers that are continuously measuring soil moisture, soil and air temperatures, and humidity. (Center) Dr. Joseph LaManna stops to take in the view at the Little Belt Mountains' Tenderfoot Valley in western Montana with his dog, Kimber. (Bottom) On Panama's Barro Colorado Island, former undergraduate students (L to R) Marley Borham, Karin Gredvig and Emma Baumgart, all Arts '18, collect data for their Tropical Ecology course taught by Dr. Stefan Schnitzer.



The new Environmental Science program prepares students to understand a growing list of contemporary environmental concerns — the effects drought and wildfires have on insects and plants, and lianas' role in rain forest tree diversity, for example.

Current NSF funding will allow LaManna to convene panels of experts to come to a consensus on one process for maintaining plant diversity. If too many plants of the same species grow too closely together, many will die off because of shared diseases and intense competition — and these deaths allow other types of plants to move in, thereby increasing diversity. But it's not yet known how significant this is for overall plant diversity. These workshops, to be held at Marquette, hope to establish “a common currency” to evaluate these ecological processes. With some standards established, the groups look to set pathways to understand if these operate across the globe. “It’s a way for us to forge ahead, to plot a way forward for the entire

field,” says LaManna. “And it’s very exciting for us — to bring these world experts to Milwaukee and to showcase Marquette’s Environmental Science program.”

Drought’s impact on insect ecosystem contributions

It’s hard to imagine squeezing water from a blade of grass, but for Dr. Nathan Lemoine, assistant professor of biological sciences, it’s part of his job — and part of his NSF-funded project to study the role of insect herbivores in grasslands and how extreme drought can strengthen or weaken those insects’ contributions to an ecosystem.

At field sites near Dousman and Spring Green, Wisconsin, Lemoine has set up rainout shelters that let him impose different drought conditions on prairie grasses such as little bluestem and sideoats grama. He can then track key physiological data about the grasses: their ability to absorb nutrients from the soil, disturbances to their photosynthesis capabilities, chlorophyll levels and more.

He then looks at how herbivore insects — in this case, grasshoppers — respond to drought and affect the ecosystem. “The role of insects in U.S. grasslands and their responses to extreme drought are poorly understood,” says Lemoine. Although we might be most familiar with photographs of swarms, or “outbreak densities,” of grasshoppers destroying crops during the Dust Bowl, under the right conditions, “They actually stimulate grass activity,” he says. For instance, in that great cycle of life, decaying grasshopper carcasses contribute to soil nutrients. “We don’t really have a good sense about where, when and why grasshoppers are deleterious or beneficial to grasslands.”

As it turns out, southern Wisconsin has proved to be an excellent location to study prairie grasses. It’s home to many prairie types, which makes it easier to undertake comparative analyses. The Spring Green site, for instance, has sandy soil, so it can be considered almost a semi-arid desert even though it’s still in the same moderately wet climate as all of southern Wisconsin. In the future, Lemoine will be running similar experiments in the Black Hills of South Dakota.

In a related project, Lemoine’s graduate students will survey 16 grasslands sites from the Mississippi River

to Lake Michigan, so that they can get a pretty good sense of “what’s out there.” They will also bring back seeds and test them under drought conditions in Marquette’s growth chambers. They hope to answer the question: “Is there a specific trait that dictates how grasslands respond to drought?”

With an overarching interest in how climate change affects species’ interactions, Lemoine focused his interests as a postdoctoral fellow in a grasslands lab in the vast, desert-like plains of eastern Colorado, where there was a lot of research into drought and water loss — but not so much on “the trophic levels above the grass, the insects.” From there, he chose to pursue two big gaps in knowledge that inform his current work: Whether grasshoppers are beneficial or harmful to the grasslands, and how drought might modify the role of grasshoppers.

Signaling Marquette’s growing commitment to the study of the environment, additional members of Marquette’s environmental program include assistant professors of biological sciences Drs. Chelsea Cook, Tony Gamble and Chris Marshall, and associate professor of biological sciences Dr. Krassi Hristova, and also can be found in nearly every department in the Klingler College.

For Schnitzer, the Klingler College’s robust assemblage of ecology researchers coupled with the new environmental science major really boosts Marquette’s bona fides. “Marquette is building its research profile, and it’s letting undergraduates get research experience from leading scientists. Teaching and scholarship go hand in hand. It’s this teacher-scholar model of higher education that Marquette understands really well.”

And LaManna points out, “The addition of the environmental science major will certainly make us much more attractive to students who might have gone elsewhere.”

Taking care of the environment “is really important for the Jesuit mission,” Schnitzer reminds us. “Marquette is changing with the times, responding to student and societal needs — all that you would expect from a forward-thinking university.”

Called to Stewardship

Retiring theology professor leaves a legacy of faith-based guardianship of the environment.

By Ben Koziol

When addressing an environmental problem, conservationists often run into several interconnected problems — from skewed economic incentives to competing cultural norms to limits on the public’s education of the problem at hand. Recognizing the complexity of environmental issues, Dr. Jame Schaefer, professor emerita of systematic theology and



ethics, calls for dialogue that includes the very best of our empirical knowledge and the truest foundation of our values.

For decades, the Klingler College has vested Ignatian spirituality and the Catholic theological tradition with the task of informing a holistic ecological stewardship. Schaefer has contributed through her research and leadership in cultivating an interdisciplinary environmental ethics minor in 2001 and an environmental studies major in 2016.

Schaefer, Grad ‘94, points to data from the Pew Research Center in which more than 80 percent of people throughout the world self-identify with a religion or spirituality. Even in an age of secular institutions, a strong majority still relate to the world through faith-based spirituality.

“All world religions have traditions upon which to draw for valuing the natural world and motivating believers to live responsibly within Earth,” says Schaefer. Throughout her scholarship, Schaefer has sought to retrieve these faith traditions for motivating acceptance of moral responsibility for conserving species and the flourishing of ecosystems. She pioneered research in patristic and medieval creation theologies and eventually published three books and many articles on these themes in theological and conservation science journals.

She notes the progress Catholic theologians, the church magisterium and other religious leaders have made on this front since she began working on environmental policy issues in the 1980s. In more recent years, caring for the Earth has become a cornerstone of modern Catholic social teaching as evidenced by Pope Francis’ 2015 watershed encyclical, *Laudato Si’, On Care for Our Common Home*.

Schaefer hopes that interdisciplinary environmental science studies will strengthen in the Klingler College. Constructively relating theology, the natural and social sciences, and ethics provides students with a more comprehensive understanding of their world. She retired from the university in May 2021 after more than 25 years of service and is continuing her interdisciplinary interests through Marquette’s Center for Peacemaking.

“My students have been delighted to find faith principles for motivating the kind of behavior we should be demonstrating toward one another, other species, ecological systems and the biosphere of Earth,” she says. In the theological roots of the Jesuit liberal arts education, Schaefer sees “a tremendous promise for sharing with our students that, hopefully, will inspire them in their professions to care about and for the Earth community.”



A BONA FIDE SERVANT LEADER

By Paula Wheeler

Amid a thriving law practice, Burke Scholar alumna Brittany Lopez Naleid commits time to support domestic abuse survivors.

When she first arrived at Marquette as a scholar of the selective and service-oriented Burke Scholarship Program, Brittany Lopez Naleid, Arts '07, says, she was not at all savvy about the city. She'd spent her teen years in a suburb just a few miles north, but driving downtown to move into McCormick Hall on Marquette's urban campus "was a totally new experience."

What wasn't new for Naleid was community service, which is a requirement baked into a Burke Scholar's college years and a hallmark of Marquette's Catholic, Jesuit education. In high school, she regularly carved out time to help others — tutoring students and volunteering weekly at Sojourner Truth House to provide respite child care for domestic abuse survivors.

Today, as a seasoned attorney, Naleid still helps such survivors, but in a very different way: securing legal restraining orders, preparing abuse victims for court and handling their appeals.

This is not Naleid's job. She works full time at the Milwaukee law firm Reinhart Boerner Van Deuren, assisting employer clients with legal issues from wrongful termination and employment discrimination cases to occupational safety, shareholder disputes and non-compete agreements.

Her work on behalf of domestic abuse survivors is a part of her firm's pro bono program, and it's done on her own time.

"To help a survivor through the injunction process is maybe 10 to 15 hours of my time," says Naleid. "That's a really small amount to, hopefully, give something to someone that is really valuable to them to move their life forward in a positive way, and get out of what is generally an awful situation."

It was during her time at Marquette that Naleid's interests in service and the law crossed paths.

Her community and campus-based service projects included caring for small children at Penfield Children's Center, coaching sports

and mentoring middle schoolers at Milwaukee's United Community Center, and participating in Midnight Run and a Marquette Action Program trip. "Marquette wasn't just about taking classes and learning," she says. "It was about improving as a whole and recognizing what's around you, who is around you, your level of privilege and what you should be doing with that. That had a huge impact."

Her sophomore year, Naleid began volunteering as a victim/witness advocate at the Milwaukee County Courthouse, where her role was to ease victim and witness anxiety about appearing in court. Most arrived with many questions more logistical than legal: "People want to know what the room is going to look like ahead of time. They want to know where to sit," says Naleid. "If the defendant was in jail, it was, 'Is he going to be able to come talk to me? Will he be wearing handcuffs?'"

The experience helped cement Naleid's plan to get her law degree. Through the Wisconsin Bar Association's diversity clerkship program — for which she currently chairs the selection committee — she landed a summer clerkship at Reinhart. There, she noticed even senior attorneys devoting time to pro bono work and realized that she could apply her legal skills to support underserved communities.

Naleid's volunteerism extends to the Milwaukee Justice Center, a project co-staffed by Marquette Law School students who provide free legal advice alongside practicing attorneys. She also serves on the board for SHARP Literacy, whose executive director nominated her as a 2021 *Milwaukee Business Journal* 40 Under 40 honoree. When she was selected, Naleid says, she was "so excited, really surprised. It was really flattering."

Ask this working mom of two young children how she balances work, family and a strong commitment to community service, and she offers sage advice gained early in her career: "If you want to be good at your job, a good friend and family member, and do good in the community, you can't be all three of those things every single day. You have to accept prioritizing one or two of those things at a time."

Marquette University, P.O. Box 1881, Milwaukee, Wisconsin 53201-1881 USA

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