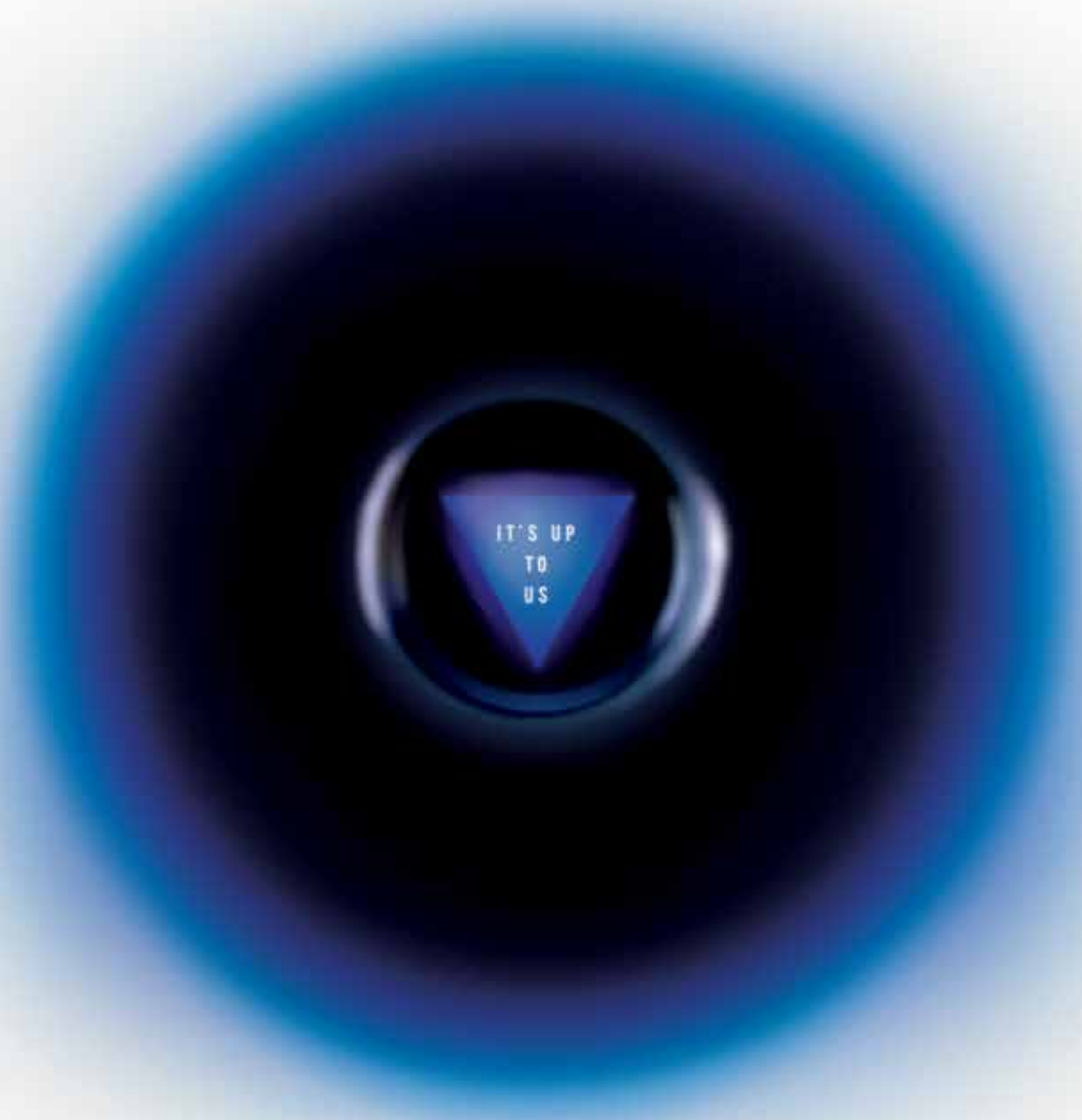
LSA

FALL 2017



Straw bales insulate and form the walls of a new green building at LSA's Biological Station. Students designed and built the sustainable straw bale house this summer, with help from Joe Trumpey, a professor in the Program in the Environment (PitE) and the U-M Stamps School of Art & Design. Their hands-on learning experience was part of a class funded by a Transforming Learning in the Third Century Initiative grant through the U-M provost's office. Photo courtesy of the straw bale squad.

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LSA tours augmented views and virtual worlds. Welcome to the reality revolution.
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Welcome to a moment of profound intellectual, social, and technological transformation.

Welcome to


THE FUTURE
IS
DARK

BY ELIZABETH WASON LIZ DECAMP

“WE’VE GOT TO FIND OUT WHAT THE HELL IT IS.”

– KATHERINE FREESE
LSA PROFESSOR OF PHYSICS

YOU CAN GET A CLEAR VIEW OF THE MILKY WAY IN THE DARK SKY OVER CHILE, WHERE MARIO MATEO LOOKS THROUGH HIS TELESCOPE. SOME OF THESE STARS AND GALAXIES ACTUALLY SHOULD CAREEN OUT OF THEIR ORBIT, OUT OF CONTROL, THROUGH OUTER SPACE. WEIRDLY, MANY OF THEM DON'T.

EVERY YEAR, MARIO Mateo brings a trash can lid to Chile and looks at the stars.

At least, the object looks like the round metal lid of a trash can. But it's a bit stranger than that. The big metal disc – about the size of a snow sled – has been studded with a constellation of holes drilled through the surface. Red, blue, maroon, and teal doodles use tangled lines to connect some of the holes, circle several, and label others with cryptic names and reference numbers. People at the airport might take one look at his gear and mistake Mateo for something other than a tenured professor – given his old T-shirt, beat-up sneakers, bushy white mustache that matches the tufts of hair orbiting his head, and unique luggage – but one of those leaky metal lids hangs on the wall of his office in LSA's Department of Astronomy.

The "plug plates," Mateo calls them, have drastically increased the number of stars he can view and measure through a telescope: an unprecedented 256 celestial objects at a time. He and his grad students precisely map the pinpoints of light they want to observe in the Chilean sky, then drill holes at those points on the disc. Braids of fiber optic cables pierce the back of the plate, where Mateo plugs each of the holes with its own wire by hand. With the help of a telescope, the fiber optics collect light from each target star glinting through the atmosphere.

Over repeated observations, Mateo learns things about the stars he sees – their chemistry, temperature, size, and motion. He gets a sense of how each star moves through space, and how quickly. After tracking thousands of stars over the years, Mateo has seen for himself what some scientists have puzzled over for a while: That something weird is going on.

Stars at the outer edge of small galaxies orbit the galactic center much faster than they should. Galaxies, too, orbit each other, and Mateo finds that distant galaxies also spin more quickly than expected around our own galaxy, the Milky Way. Imagine spinning a yo-yo around your head so fast that the toy snaps off its string and flings away. Peripheral stars move so fast that they actually should detach from their home galaxy like wild projectiles.

But they don't.

As early as the 1930s, astronomers came to assume that some mysterious *thing* must grip celestial objects in their outer orbits, keeping stars from busting loose. They gave the hypothetical thing a name: dark matter.

More weird supporting evidence for that idea popped up, and the imaginative explanation took hold: Dark matter fills the universe as invisible mass and skews our view of other objects. About fifteen percent of matter in the universe must be the atomic stuff we know, see, sit on, and eat; the rest is dark matter and doesn't really interact with us at all, except through gravity. If all that is true, then dark matter originally seeded today's galaxies, our planet, and the life we know.

Dark matter has become the most convincing explanation to astrophysicists – the thing that almost all of them are searching for, but nobody's ever found.

DARK MATTER IN PARTICULAR

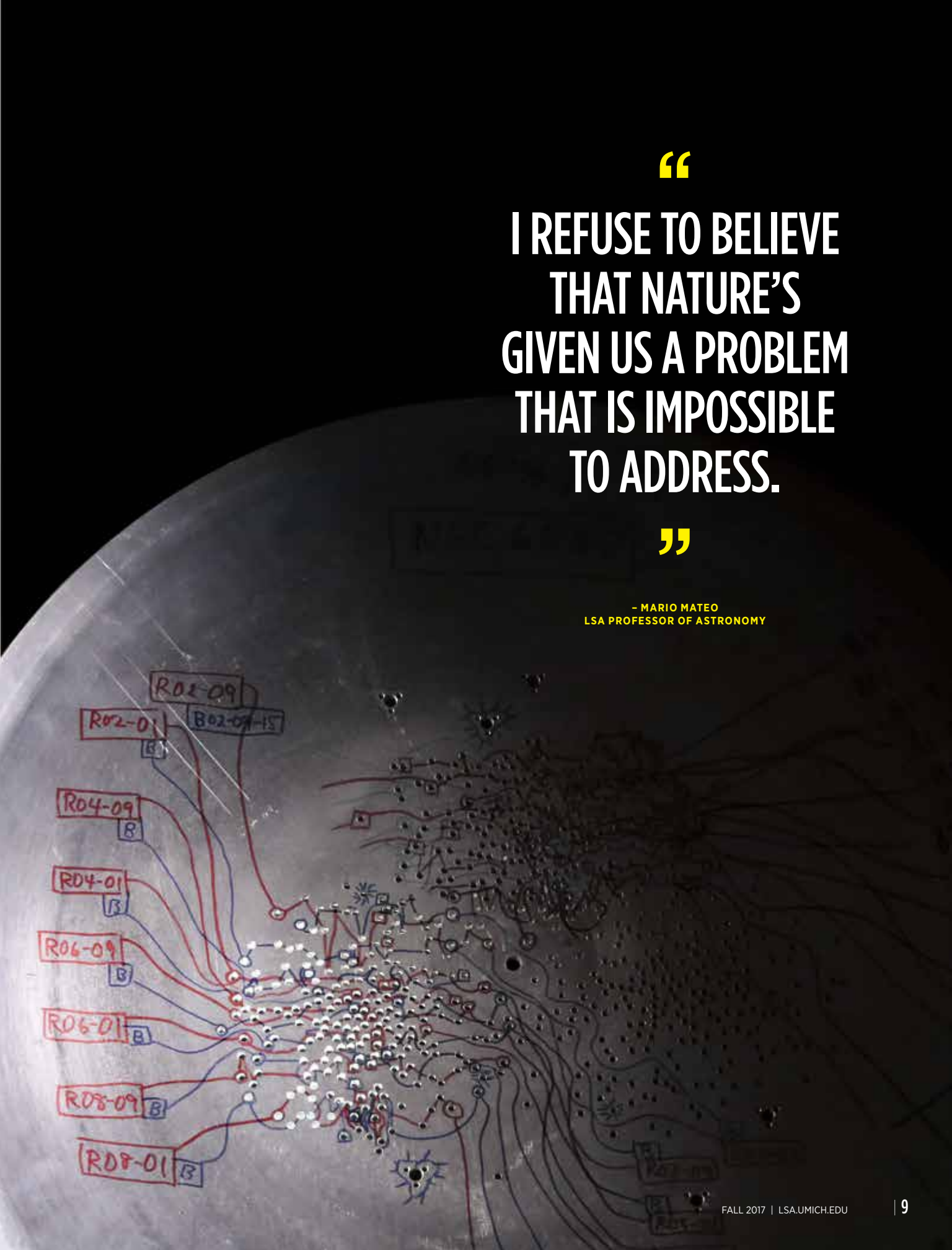
"It's 85 percent of all matter," says theoretical physicist Katherine Freese about dark matter in the universe. "We've got to find out what the hell it is, obviously."

In the past, astronomers found the planet Neptune when the familiar planet Uranus seemed to wobble outside of its expected orbit. Tracing the weird wobble to its cause revealed the once invisible planet Neptune, whose gravity tugs at Uranus in ways we can predict. "Neptune was 'dark matter' at one point, right?" says Mateo. "It was causing Uranus to move in a way that nobody could see."

What if other giant objects in space, too dim to notice with telescopes, have enough gravitational pull to cause the unexpectedly high speeds of outer stars? Freese ran the numbers and nixed the idea. The universe just doesn't hold enough atomic matter to account for all that gravity.

Now, she's betting big on theoretical particles. Freese and many others imagine dark matter as a substance made of Weakly Interacting Massive Particles (WIMPs). Depending on the mass of these particles – which we don't yet know – Freese says that their density on Earth would be about one WIMP per coffee cup. Billions travel from outer space and through every person on Earth every second, but direct hits should happen much less frequently.

Natalie Condon



“I REFUSE TO BELIEVE THAT NATURE’S GIVEN US A PROBLEM THAT IS IMPOSSIBLE TO ADDRESS.”

– MARIO MATEO
LSA PROFESSOR OF ASTRONOMY


“
I’M CONCERNED THAT WE ARE HUNG UP ON SOMETHING CONCEPTUAL.
”
– STACY MCGAUGH
Ph.D. 1992

LUX, THE ENORMOUS UNDERGROUND DARK MATTER EXPERIMENT HOUSED IN AN OLD, ABANDONED GOLD MINE IN SOUTH DAKOTA. LUX SOON WILL BE REPLACED BY A BEEFED-UP VERSION: THE LZ EXPERIMENT. Sanford Underground Research Facility/Matthew Kapust

In theory, a WIMP can strike the nucleus of a cell or substance with enough oomph to jiggle atoms at the smallest scales. Freese calculates that collisions could happen as rarely as once a month. "For a 150-pound human," she writes, "the number of hits could be as frequent as one every minute!" No need to call your doctor—experts predict no negative health effects of the hypothetical particle striking your cells.

If dark matter really is matter made of WIMPs, we could catch the particles in a few ways. Massive particle smashers like the Large Hadron Collider might incidentally create a WIMP, but no sign of the mystery particle has shown up yet. Satellites in outer space could detect the byproducts of WIMPs, but while some surveys have announced exciting leads, all have rung as false alarms so far.

Most current efforts in the hunt for dark matter particles spend serious resources building detectors, with the aim of directly snagging WIMPs.

The mechanics of WIMP detectors tap into calculations that Freese cooked up in the 1980s. Her work predicted ways that WIMPs would scatter in theoretical collisions with atomic matter. By her estimate, one in ten billion WIMPs traveling through Earth would strike a detector nucleus so it leaves some sign of its existence. Dozens of teams of physicists have built such detectors with government and philanthropic support based on Freese's predictions, which promise a deeper understanding of the universe, along with an abysmally low probability of success. In other words, you can look for them—but they're going to be really hard to find.

Yet teams of scientists are holding out on vanishingly low odds of ever detecting WIMPs.

UNDERGROUND AND IN THE DARK

"If I didn't have hope, I'd be working on something else," insists Wolfgang Lorenzon, a professor in LSA's Department of Physics.

Lorenzon first got involved in the hunt for dark matter particles with the PandaX experiment in China. "I think it's probably the best place in the world to do a dark matter experiment, because it's covered by 2.5 kilometers of marble," he says. It's the deepest laboratory in the world by a wide margin, though all WIMP detectors lie low underground, often buried beneath a mountain or stashed in a tunnel.

"All of these experiments have to go deep underground to get away from cosmic rays that otherwise would be bombarding the detector constantly," says Freese. The mountain topping PandaX, in particular, has an almost crystalline marble structure that "expels a lot of the impurities that you don't want," says Lorenzon. Still, WIMPs are teeny-tiny and hard to come by. Interference by other small particles presents a confounding challenge, he says, "that plagues you all the time."

Lorenzon and his lab now work with the LZ experiment, built 1,480 meters deep in an abandoned South Dakota gold mine. They're building a device that will remove radon contaminants released by the experiment itself, including radon from the welded stainless steel tubing that transports gases through the detector.

“IF I DIDN’T HAVE HOPE, I’D BE WORKING ON SOMETHING ELSE.”

– WOLFGANG LORENZON
LSA PROFESSOR OF PHYSICS

A handful of dark matter detectors have some features in common. To try to catch WIMP particles, some research teams fill a giant tank with hundreds of pounds of liquid xenon, which nests within an even larger tank of ultrapure water to further shield against contaminating particles.

Harvesting xenon involves distilling it from the air as a liquid, keeping in mind that radioactive krypton also lurks there as another contaminant—a lingering residue in the atmosphere from historic nuclear weapon tests.

Xenon should work better than many other elements in WIMP detectors because its nucleus is so large; it offers the biggest practical target for the putative dark matter particle. If a WIMP strikes a xenon nucleus, the collision should produce a tiny spark of light that the detector then magnifies as a signal we can see.

But the hunt for dark matter particles, involving dozens of detectors internationally, has yielded nothing for decades. The one exception comes from an experiment called DAMA, housed beneath an Italian mountain. The detector has caught consistent WIMP hits for more than 15 years, but few in the scientific community accept the data. For one thing, instead of using xenon, the DAMA experiment operates with a proprietary crystal in its detector. Their exclusive access to the material makes comparison difficult among experiments—not to mention that it lends an unusual secrecy to their methods—and people wonder whether their results just reflect particle contamination. It doesn’t help that the DAMA team refuses to release its data.

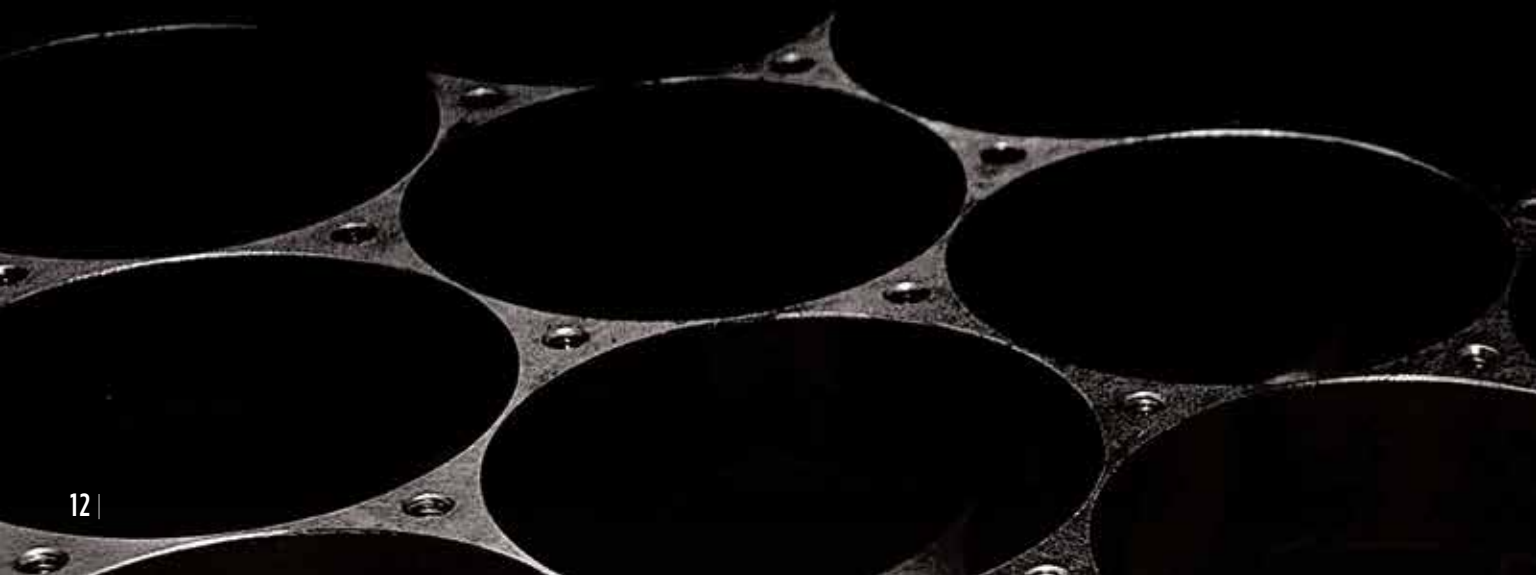
Researchers continue building new detectors all over the world, some with similar crystal materials as DAMA, so they can validate DAMA’s results. Maybe soon, those sole signs of WIMPs may start to make more sense. But with all other detectors coming up empty for decades, how long will researchers look for WIMPs before they give up on them as the building blocks of dark matter?

THE GRAVITY OF THE SITUATION

“The disquieting alternative is that a paradigm shift is required to make sense of the data,” Freese admits in her book, *The Cosmic Cocktail*. “Perhaps an entirely different way of looking at the world will replace the need for these invisible pieces of the universe.”

In other words, what if all these physicists excited over WIMPs turn out to be a bit too excited about the elusive particle?

To be sure, most proposals that explain the wonky speeds of celestial



objects in outer orbits trace back to reasonable theory. But some scientists speculate: Could dark matter exist as clouds of several different particles at once? Does it act less like a particle and more like a wave? What if dark matter isn't matter at all?

Here's another possibility: What if gravity just works differently at the enormous scale of the universe? Isaac Newton's laws first captured what we know about gravity, motion, inertia, and momentum. We take for granted the physics we experience every day, and now we even accept the revolutionary idea that those familiar forces don't apply at the tiniest quantum scales. Would it be so discomfiting for Newton's laws to transform once more at the opposite end of the range, at sizes that span galaxies?

Modified Newtonian Dynamics (MOND) suggests exactly that: Maybe we and Newton don't fully understand gravity.

"I was shocked to see how many things that I just assumed dark matter would be better at, MOND was pretty good at, too," says astronomy alumnus Stacy McGaugh (Ph.D. 1992). His work takes the mathematical predictions of Newton at the galactic scale and tweaks them just a bit; he can pretty reliably predict what often surprises an observer at a telescope. "There are many, many situations in which those predictions come true," he says. "Quantitatively, accurately, amazingly."

Then again, he says, "There are some situations in which they don't."

McGaugh regrets the "dark matter" label that early astronomers applied to their strange observations. He thinks the term itself may have set a precedent that blocks us from weighing other options to explain what we see in outer space.

"I realized that it was a linguistic hangup. We'd called it the 'dark matter' problem, and so that framed how we thought about it, in terms of invisible mass," says McGaugh. "I'm concerned that we're hung up on something conceptual."

"If I were some sort of alien being that lived a billion years, and I wanted to travel to a distant galaxy, I'd use MOND to get to that galaxy," says Mateo. "And MOND would actually get me there! I couldn't use the dark matter model and actually get from here to there predictably."

"MOND as it's written now is not a complete answer," says McGaugh. "But I think it has to be part of the final solution. We need a satisfactory explanation of why MOND gets the predictions right."

"And so," he prompts, "Which thread of evidence are you going to believe?"

UNIVERSAL TRUTH

Freese believes that these discoveries will happen in her lifetime, and she's prepared to throw away her own predictions if the data point in another direction.

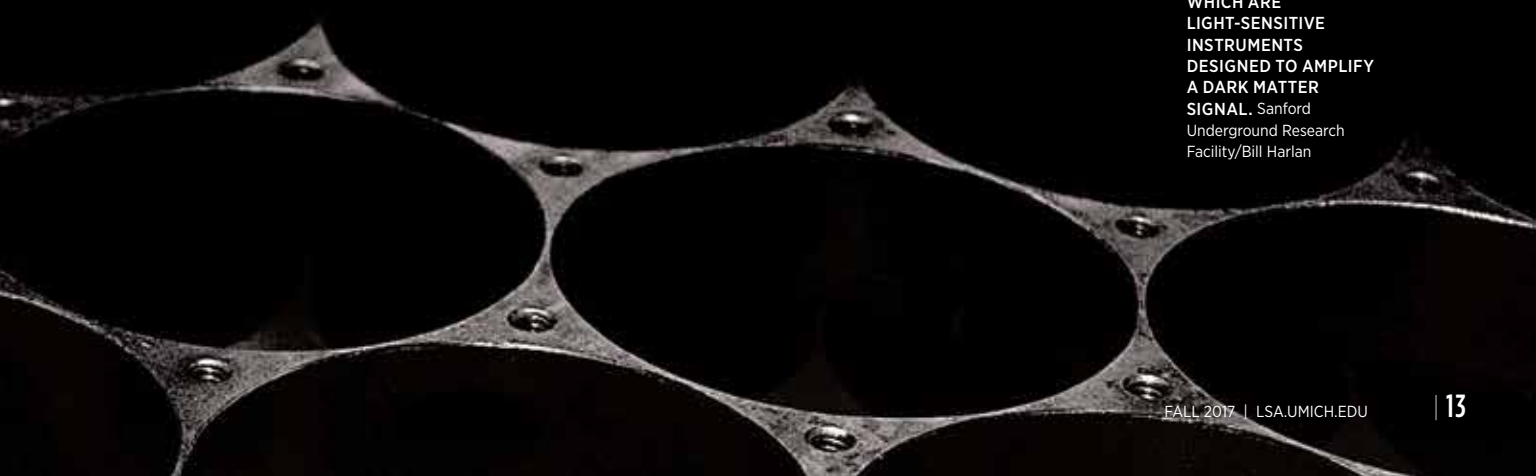
"We start on faith—that's called theory," she says, "and then nature is what it is, and you've got to say, 'Okay.'"

"I refuse to believe that nature's given us a problem that is impossible to address," says Mateo. "Physics and astronomy have long progressed without having a good fundamental physical explanation for dark matter, but we're not getting closer to it, and that's unusual. That's what's weird."

"If you're in this kind of business, then that's something you have to be comfortable with," Lorenzon says. "Some people may need to have a result at the end of the day, otherwise they don't feel the work that they've done is valuable. I don't feel that way."

Whatever the answers that resolve this stubborn conundrum, Freese stays optimistic.

"When there are great advances in fundamental science, it always affects human existence in some way we can't foresee," she says. "I would say that's true here, too." ■



COMPARTMENTS IN THE LUX DARK MATTER DETECTOR HOLD HUNDREDS OF PHOTOMULTIPLIERS, WHICH ARE LIGHT-SENSITIVE INSTRUMENTS DESIGNED TO AMPLIFY A DARK MATTER SIGNAL. Sanford Underground Research Facility/Bill Harlan

BY RACHEL REED

ERIN NELSON, LIZ DECAMP, NATALIE CONDON

Virtually Everything

THE REALITY REVOLUTION IS GIVING US NEWER AND MORE POWERFUL WAYS TO SEE, FEEL, AND THINK. HERE'S HOW WE MIGHT HARNESS THE TECHNOLOGY FOR A BETTER FUTURE.

YOU ARE STANDING IN FRONT OF THE SUN. FROM THIS DISTANCE, ITS ROILING PLASMA SEEMS CLOSE ENOUGH TO TOUCH. BEADS OF SWEAT FORM ON YOUR BROW — YOU'RE CONVINCED YOU CAN FEEL ITS SEARING HEAT.

LOOK DOWN AND SEE THAT YOU'RE FLOATING AMONG THOUSANDS OF TWINKLING LIGHTS — THE STARS, DUST, AND MATTER THAT MAKE UP THE UNIVERSE, SWIRLING AND STRETCHING FARTHER THAN THE EYE CAN SEE. TURN YOUR HEAD AND YOU SPY A TINY BLUE ORB, ITS HUMBLE APPEARANCE BELYING THE LIFE TEEMING ON AND WITHIN IT.

THE ORB IS EARTH. WHICH IS WHERE YOU ARE, TOO, WHEN YOU PULL OFF YOUR HEADSET AND RETURN TO REALITY. BUT WHAT *IS* REALITY ANYMORE?

IN THE PAST FEW YEARS, the market has exploded with devices intended to modify, enhance, or even replace our reality—temporarily, anyway. From Google Glass to the Oculus Rift to the HTC Vive, this technology has transformed from a futuristic novelty to a set of sophisticated systems that can be purchased for a (relatively) modest price at your average electronics retailer.

Although people have long dreamed of machines that could alter our perceptions, virtual reality had its true genesis in the mid-20th century. There was the Sensorama, an arcade-style booth that encircled the seated user's head, pairing a 3-D film with additional sensory experiences such as smell and motion. (The Sensorama never took off.)

Then, in the late '80s, video game juggernaut Nintendo tried out the Power Glove, which further pushed the boundaries of interactivity. But once again developers found themselves stymied by unrealistic graphics and a technology that wasn't quite ready for prime time.

Fast forward to today, when lightning-fast internet and near-photorealistic graphic capabilities have combined to make virtual and augmented reality a major topic of conversation once again. New VR devices—which sit atop the user's head, blocking out all visual input from the real world and replacing it with either 360-degree video or a computer-simulated world—arrive seasonally.

A complementary technology called "augmented reality," or AR, has been gaining steam, too. With AR devices such as Google Glass and Microsoft HoloLens, a user's real surroundings are visible, but the devices map walls and flat surfaces, placing dynamic items within the viewer's frame of reference. Interest in VR, AR, and related technology has spread to companies like Facebook and the *New York Times*, which are both experimenting with how to integrate interactive 360-degree videos into their services.

But now that the technology is more widely available, questions loom. Can VR and AR help make us happier, better people? Can they teach us something about ourselves, about the world? Can they engage us in more deeply intimate ways? And would that be a good thing? And who decides?

Welcome to the reality revolution.

WELCOME TO THE REALITY REVOLUTION.


THEY FLEW
THROUGH
THE AIR
AND DIPPED
BETWEEN
SKYSCRAPERS.

We Are Who VR

Today more than ever, our ambivalence toward technology grows in direct proportion to our familiarity with it. But Stanford University Professor Jeremy Bailenson (A.B. 1994) is optimistic about the staying power of VR. He sees virtual reality's potential to improve our skills, careers, and even mindsets.

At the cutting-edge Virtual Human Interaction Lab, Bailenson is working on everything from how virtual reality could help combat racial bias to fostering cooperation between people to encouraging eco-friendly choices. He has already shown that certain virtual experiences can help change people's minds and behaviors, sometimes long after the fact.

In one experiment, Bailenson's lab asked participants to pop on a headset, which transported them to a large empty city where they flew through the air and dipped between skyscrapers. They were then alerted that there was a child in danger somewhere in the city. To win the game, the participants had to search the city and find him, administering a dose of medicine in the nick of time and saving his life.

Some people got so into the simulation that they tried to leap into the air or jump backward, even though they weren't really flying over the rooftops of a city. But the most interesting effects occurred once the headsets were off. After the experiment, the lab technician led each participant back to a debrief room, where she would "accidentally" drop the pens and pencils she was carrying. Almost without fail, those who had just finished the game rushed to help. In fact, they were much more likely to come to the assistant's help when compared to those whose VR experience had them riding passively in a helicopter instead of actively flying around and saving the child. Had the experience of rescuing a person virtually primed them to do good deeds?

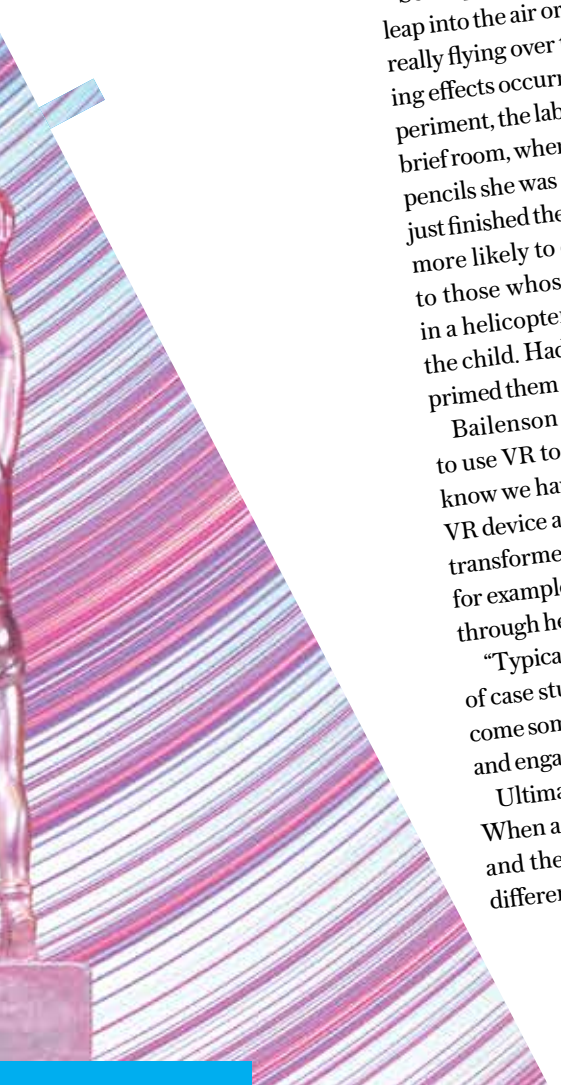
Bailenson thinks so. His lab is also tinkering with how to use VR to reduce racial bias, even one that we might not know we have. In another experiment, participants put on a VR device and look into a virtual mirror, where they've been transformed into someone unlike themselves. A white man, for example, might become a black woman, seeing the world through her eyes.

"Typical diversity training uses role playing or the reading of case studies," Bailenson says. "But when you literally become someone else and walk a mile in their shoes, motivation and engagement are amplified."

Ultimately, he says, "VR is about producing 'aha' moments. When a person changes race or gender in the virtual mirror, and then experiences prejudice firsthand while wearing a different body, their reaction is often intense."

And the effects aren't merely temporary: Bailenson's research has shown that experiment participants displayed increased empathy not only immediately following their VR experience but even two, four, and eight weeks afterward. "In general," he says, "our research shows that the effects of VR tend to last longer than those produced by watching a video or by role playing." A new book about his work, *Experience on Demand*, will be released in early 2018.

In addition to his work in the lab, Bailenson's belief in the power of VR led him to create his own company, STRIVR, which connects VR technology with corporations and sports teams. Cofounded with Derek Belch, a former assistant football coach at Stanford, STRIVR helps train athletes, introducing them to new plays and practice drills while minimizing the chance of injury. It also works with big-name companies like Walmart, which uses the technology to expose new employees to problems they might encounter on the job, allowing them to learn in a safe environment before they ever set foot on the shop floor.



The ABCs of VR

Imagine being able to analyze any fossil or artifact you want, whenever you want. To be able to turn it around, look inside, and even see how it was found in the real world from the comfort of your own lab—or even your own home. Picture yourself learning about conservation methods by shadowing park rangers in China as they try to rescue giant pandas from extinction. All these experiences are possible with VR, opening doors to personalize the educational experience like never before.

Some LSA departments are getting in early by partnering with LSA Information Technology to experiment with novel ways to use VR for displays, research, and more. They're working to develop the Microsoft HoloLens for use with the 3-D images of fossils created by the U-M Museum of Paleontology for its Online Repository of Fossils. Their work will allow anyone, anywhere to spin, enlarge, zoom in, and get up close to fossils without any risk of damage. The researchers are even working on ways to display the fossils as they looked when they were discovered on site, which can tell paleontologists even more about the animals and how they ended up there. Additionally, the Kelsey Museum of Archaeology has developed a VR program to give visitors to last year's Oplontis exhibition a hyperrealistic, firsthand view of what an ancient Roman villa would have felt like from the point of view of a villa's owner and slaves.

Others, such as LSA alumni Derek Koenig (A.B. 1989) and Matt Katzive (A.B. 1991) of Discovery VR, are working to blend education with entertainment to create uniquely enriching and powerful learning experiences. Their company, which is part of Discovery Communications, the company that owns the Discovery Channel, has created hundreds of immersive films.

"With VR, we have the ability to inspire true empathy," says Koenig. "We can transport people to another place in the world, emotionally to another situation, or even through time. That's the beauty of it."

The team has captured everything from the quiet grandeur of a California redwood forest to an irreverent dog's-eye view of Animal Planet's annual Puppy Bowl. In Nepal, their team joined locals and the World Wildlife Fund as they rode on elephants to capture and relocate endangered rhinos. They even equipped Olympic skier Bode Miller with a head-mounted camera to film a thrilling downhill run.

"VR has the potential to really reshape your perspective," says Katzive, "whether that is through storytelling or education or pure entertainment."

Katzive also believes that as humans interact more with technology, that technology will change in response to us and not the other way around. He also says that while many early VR experiences are solitary, the situation could change with time.

"I have a feeling technology tends to evolve along the lines of human needs. And the human need for social interaction will never go away," he says.

A New Cinéma Vérité

A perhaps apocryphal story describes the first time audiences saw the Lumiére brothers' 1895 short film *Arrival of a Train at La Ciotat*. Some viewers, unfamiliar with cinema, were so gripped with panic at the image of a train barreling toward them that they fled the theater. Obviously, audiences have since acclimated to movie screens, but virtual reality holds the potential to dazzle us again as a thoroughly immersive entertainment experience. Pop on a headset and suddenly you're exploring a sunken ship as a massive orca glides by, or sit in the cockpit of a spacecraft firing at enemy planes. Whether the experience is interactive, as with a game or a film, virtual reality has the ability to undermine our connection to the real world, promoting the user from passive observer to vital participant in an immersive virtual world.

Carissa Flocken (A.B. '14) and Ben Doyle (B.S. '15) recognized early the possibilities afforded by VR, picking up and moving to Hollywood after graduation in the hopes of making their own immersive films. Instead, they realized that although millennials were craving—even expecting—new methods of storytelling, not everyone was buying the headsets needed to view the films. So they set out to solve that problem.

"Our idea was to build a browser-based 360 video player that anyone could use on their phones—no app download needed," says Flocken. "We'd be the 'entry point' to VR."

Now Flocken and Doyle's company, Entrypoint VR, helps big media producers and independent artists alike create and share 360 videos—tapping into a market that Goldman Sachs predicts will surpass television in revenues in the next ten years.

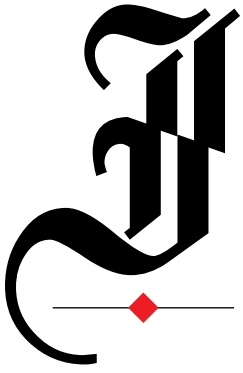
"The history of media has proven that people are always hungry for new ways to experience, to share, to see," says Flocken. "Any new medium that can expand their arsenal of tools to do that will be adopted by masses of people. We think that people are only going to increase their expectations for interactive, responsive content that they can customize and share." ■


“WE CAN TRANSPORT PEOPLE TO ANOTHER PLACE IN THE WORLD, EMOTIONALLY TO ANOTHER SITUATION, OR EVEN THROUGH TIME. THAT’S THE BEAUTY OF IT.”

THE CHANGING TIMES

A deputy managing editor of the *New York Times* talks about the future of truth and why who is included in the story matters so much.

BY SUSAN HUTTON
WALLING MCGARRITY



IT IS THE summer of 2017 and Rebecca Blumenstein, a deputy managing editor of the *New York Times*, is wondering what is going to happen next. "Everything is changing," she says, "from trade policy to taxes to healthcare to social safety nets to relationships with almost every country in the world. Companies' relationships with the government are changing, and the very notion of whether GM should even have plants in Mexico is being challenged. Retail is falling apart because Amazon is so successful. It's just a giant story and I feel, like many others, supercharged by it.

"Facts do not belong to some bygone era. I think that's a dangerous game. News organizations have to remain committed to facts."

"And if you're a political reporter now," she adds, "it's just an endurance test. Rarely has one seen such an intense news cycle last for so long. We are following bigger stories than we've seen in many, many years."

Blumenstein speaks from experience. After four years at the *Michigan Daily*, including one in which she was editor-in-chief, Blumenstein began her career as a political reporter covering county government at the *Tampa Tribune*. She moved on to Gannett Newspapers and *Newsday* before joining the Detroit bureau of the *Wall Street Journal* to cover General Motors. She stayed with the *Journal* for more than 20 years, covering technology and telecommunications before becoming the paper's China Bureau Chief. She continued to climb the ranks until she became the *Journal*'s deputy editor-in-chief, a position she held until this year when she joined the *New York Times*.

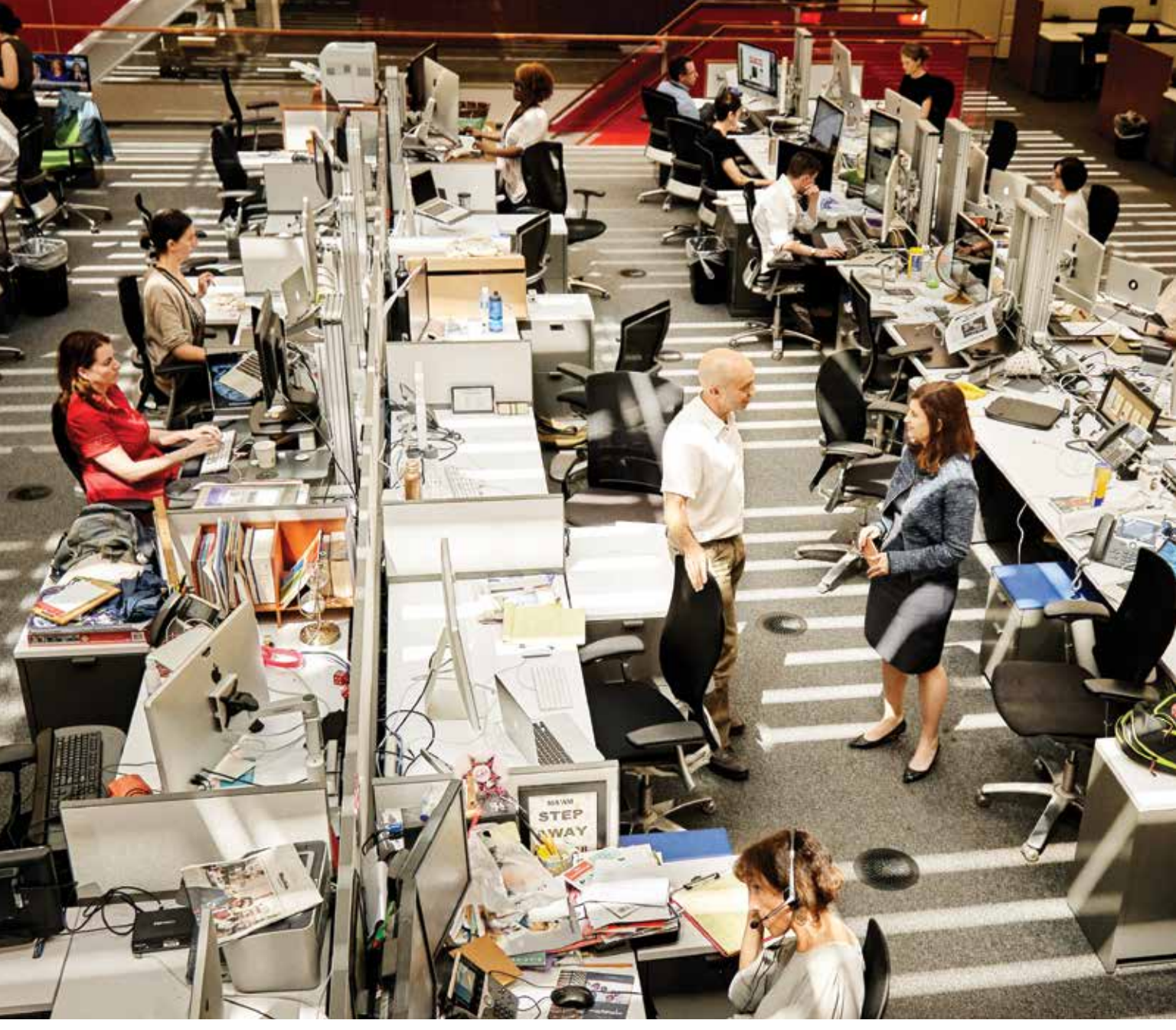
To manage the steady onslaught of news, consumers are increasingly returning to an old reliable guide: the front page of the daily paper. Digital or physical, the front page curates and organizes the superabundance of stories, and they're stories people want to read. In the first quarter of 2017, the *Times* added 300,000 new subscribers. The *Columbia Journalism Review* and the *Wall Street Journal* have seen upticks in their paid support, too. "It crystallizes our job," Blumenstein says, "simply do journalism that's good enough that you're willing to pay for it."

THE PUBLIC DISTRUST

The trail leading up to many major news stories is strewn with missteps. In Newtown, Connecticut, Ryan Lanza was initially identified as the gunman at Sandy Hook Elementary School when it was actually his brother Adam. Days after the Boston Marathon bombing, mainstream news organizations widely reported that a suspect had been taken into custody when, as it turned out, no one had been. Reporting errors have always happened. In 1917, news radio reports relayed fake telegraphs that declared the Titanic was still sailing. And who can forget the notorious edition of the *Chicago Daily Tribune* that trumpeted Truman's defeat?

Breaking a fast-moving news story is a snarly, complicated business. It requires piecing together facts and trying to confirm them beneath monstrous


The New York Times
EXPRESS SERVICE
2B25



BLUMENSTEIN TALKS TO PLANNING EDITOR BRIAN FIDELMAN ON THE *NEW YORK TIMES* NEWS FLOOR. SHE CONSIDERS THE *MICHIGAN DAILY* ONE OF THE MOST SIGNIFICANT TRAINING GROUNDS OF HER CAREER.

pressure to get the story out fast. Reporting errors certainly undercut the media's credibility, but these days earning readers' confidence relies on more than reporting chops.

Decades of polarized politics, fortified by a bitter presidential campaign, have made it possible for citizens to live inside their own partisan bubbles that often come equipped with their own sets of facts. While news organizations work to provide the public with accurate accounts, social media works to develop algorithms to give users more of what they want, quietly curating what appears in their newsfeed to reinforce what they already believe – whether it's true or not.

"There's a lot that's been said about fake news, and people have even gone so far as to ask what is the use of facts," Blumenstein says. "But facts do not belong to some bygone era. I think that's a dangerous game. News organizations have to remain committed to facts."

Fake news played an important role in the 2016 presidential election. There was the fake news story that Hillary Clinton had sold weapons to ISIS, and the one that said the Pope endorsed Donald Trump in the presidential election. On Facebook, top fake news stories engaged users almost two million times.

Gallup, Pew, and Quinnipiac University have all conducted polls that show Americans' trust in the media has steadily declined since the mid-1970s – and Republicans' faith in the media has declined faster than Democrats'. Gallup's most recent poll,

"There is certainly a distrust of the news media that is borne out of the fact that people feel they haven't been represented adequately."

conducted during the 2016 presidential election, showed that Americans' confidence in the media had hit a record low 32 percent; among Republicans, it was an abysmal 14 percent.

"I'm struck by, whenever there's a big news event, how half of what you see on social media is right and half of it is wrong," Blumenstein says. "People can end up inside their Facebook bubble or their Twitter bubble and stay inside them ad infinitum.

"The social media platforms are having a reckoning now," she adds. "They need to develop new algorithms to help root out things that aren't true. It's a huge problem."

Obviously, truth is important. Blumenstein believes the truth not only means fidelity to events. It also includes where they happened and what they mean to the people involved. She believes this even more strongly since the pundits, pollsters, and media got the 2016 presidential election so wrong.

"There is a division in this country that the election laid bare," she says. "I think it is more incumbent on us than ever to try to represent as diverse a set of concerns as possible that extends to different kinds of people and to economic issues. There is certainly a distrust of the news media borne out of the fact that people feel they haven't been represented adequately."

Adequate representation is an old issue for Blumenstein – one she has wrestled with since her time at Michigan.

"People need to learn to be challenged by those who they don't agree with all the time. It somehow feels like the value of that discourse has disappeared from the conversation."

CODE DREAD

Since the 1960s, when Tom Hayden was an activist and an editor of the *Daily*, students at the University of Michigan had worried about a possible code of conduct that would regulate their behavior outside the classroom. There had been talk of such a code for years. The administration had floated some ideas and proposals, but nothing had stuck.

"It was a core mission at the *Daily* to fight the code or any attempt to regulate conduct outside of the classroom," Blumenstein explains. "But then in 1987 there were some particularly ugly racist incidents on campus that everyone found quite upsetting. The administration took the concern about racial speech and the concern about the code of conduct and used it as an excuse to impose a code on racist speech. And this was a twist nobody saw coming."

Blumenstein was editor at the *Daily* when, in 1988, the code of non-academic conduct – one of the first in the country – was finally imposed. The code prohibited behavior that "stigmatizes or victimizes" minorities or "creates an intimidating, hostile, or demeaning environment." It split the *Daily* in two. Some wanted to use the code to fight campus racism; others remained staunchly anti-code. The code was taken to court and was ruled unconstitutional in 1989. That took care of the code problem, but not the problem of racism on campus.

"It's obviously a very stubborn problem," Blumenstein says, "and a good portion of it concerns representation. African American students were about four percent of the student population when I was there," she says, "and I don't think it is much higher now." African American students made up 4.5 percent of the 2016 entering class.

Blumenstein thinks the election results that surprised so many news organizations have been a real wake-up call to the industry. "It is so important for news organizations to represent the whole country – not just the coasts – and to be able to earn trust."

The *Wall Street Journal*, which ran a series of stories from communities that had lost factory jobs to China, did a better job representing the country than most news organizations, Blumenstein says. To many people living in the Midwest and in the Rust Belt, such business reporting is vital. It takes on issues such as pay, work, and health insurance – the bread-and-butter discussions people have every night at the dinner table.

"A lot of people feel that no one talked to them and no one really addressed their concerns as much as Donald Trump did," she says, "and I think that's pretty valid.

"People need to learn and be challenged by those who they don't agree with all the time," she continues. "It somehow feels like the value of that discourse has disappeared from the conversation."

PAPER SCRAPS AND PODCASTS

Blumenstein's first year at the *Michigan Daily* was the last year reporters put the paper together with typewriters, paper scraps, and glue.

"We would rip pieces of paper apart, glue them back together, and send them downstairs," she says. "They would be typed up by typesetters who hopefully could read our chicken scratch over our bad typing and put it on the page.

"It was pretty old school."

During her four years at the *Daily*, the paper turned from typewriters to computers. An Associated Press machine arrived in the newsroom and spat out wire copy and photos from around the world.

In the more than two decades that have followed, the change technology has brought to journalism is staggering. Today a news story can be told with words, interactive graphics, videos, audio, podcasts, or snaps (the things you make on Snapchat). "In that sense, journalism has completely changed," Blumenstein says, "though, fundamentally, reporting has not."

"We have to do the kind of journalism that tells people things they didn't know, that challenges their beliefs, that uncovers wrongdoing, and that holds the powerful to account."

BLUMENSTEIN AND HER HUSBAND, AUTHOR ALAN PAUL (A.B. 1988), ON THE COVER OF THE FASHION ISSUE OF THE *DAILY*'S *WEEKEND MAGAZINE*.

However it's delivered, Blumenstein believes the value of original reporting has never been higher, nor has the importance of trusted news organizations to show up on big stories and to report them out.

"There's no way you can sit out a story like the Trump presidency," she says. "It is our obligation to cover these stories and bring home some of the things that are happening both in America and abroad—to really do journalism that tells people things they didn't know, that challenges their beliefs, and that uncovers wrongdoing and holds the powerful to account."

Blumenstein is particularly excited about a new endeavor coming out of the *Times*'s newsroom: a podcast called the *Daily*, in which journalists talk to each other about news events and reporting, and try to bring listeners inside the process. Listeners might hear conversations with coal miners or with a woman whose daughter was murdered by a man about to be executed on death row. Blumenstein applauds the *Daily*'s commitment to presenting different sides of the story. Listeners like it, too. As of July 2017, the *Daily* has been downloaded or streamed more than 40 million times, and it averages 500,000 new downloads and streams a day.

That's a lot of people, and that very high profile is something Blumenstein is always careful to keep in mind. A story that runs on the *New York Times* site can garner two or three million page views—a formidable responsibility to get the facts straight.

"You have to be very cognizant of it, and to be as careful and fair as possible knowing that a lot of people are going to see the story," she says.

It's a time of great opportunity, but Blumenstein admits it can also be overwhelming. Though she only joined the *Times* in February, she's excited to be there during a time when readers have a real sense of urgency and are using the *Times* as a guide through a changing and complicated world.

"We feel like we have a front-row seat to history right now, and the readers are coming along. There's a lot of industry changes, and the story's moving fast. It's just a wild ride," she says, "but it feels like a very important one right now." ■

(LEFT) Courtesy of the U-M Bentley Historical Library

ALUMNI BY BRIAN SHORT

Ink and Papers

A medium evolves.

IN 1992, ART Spiegelman's *Maus* won the Pulitzer Prize. Then, in 2015, Cece Bell's graphic memoir *El Deafo* won a Newbery Honor and the graphic novel *This One Summer* by Mariko and Jillian Tamaki won a Printz Honor and a Caldecott Honor—the first time comics had taken so many important national prizes for children's literature.

Then, in 2016, *March* Book 3—the final entry in a trilogy written by civil rights icon Representative John Lewis, congressional aide Andrew Aydin, and comics creator Nate Powell—won the National Book Award for Young People's Literature. And while no cartoonist has yet received the Nobel Prize in Literature, it's becoming easier to imagine.

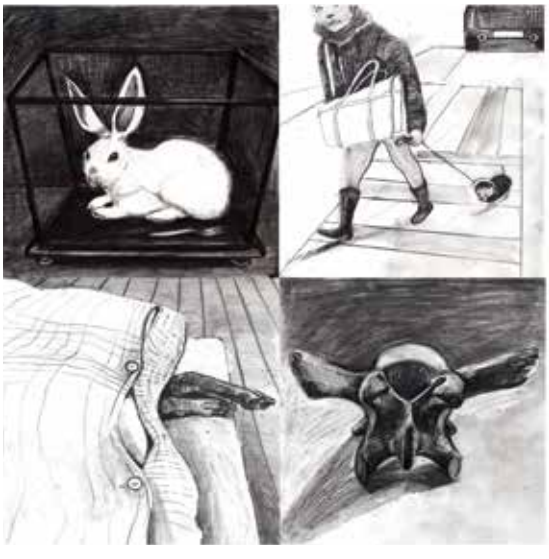
These books tackle issues such as the Holocaust, deafness, family dissolution, racist disenfranchisement, and lynching—topics hard to imagine showing up in mainstream comics of bygone eras. The medium's maturity makes it a heck of a lot more likely that you'll hear a review for a new graphic novel on NPR than you were 20, 10, or even 5 years ago. (And the chances of that graphic novel actually being good might be better, too.)

"This is a pivotal moment in the field of comics studies," says LSA alumna Elizabeth Nijdam (Ph.D. 2017). "I think everything is changing right now."

'NONE OF US WERE TALKING'

Nijdam didn't start reading comics until college, and she didn't begin her research into comics studies in earnest until after she had written her master's thesis. (It was on East German film.) But Nijdam loved using comics in the German language classes she taught, and was moved by how powerful they were as a tool for instruction and by the possibilities of the art form.

Nijdam's research covers German comics and sequential art—including the artists and creators shown on these pages—creators who channel multiple aesthetic traditions in their work, including German Expressionism and American alternative comics. Many contemporary German comics focus on the country's history, Nijdam says.



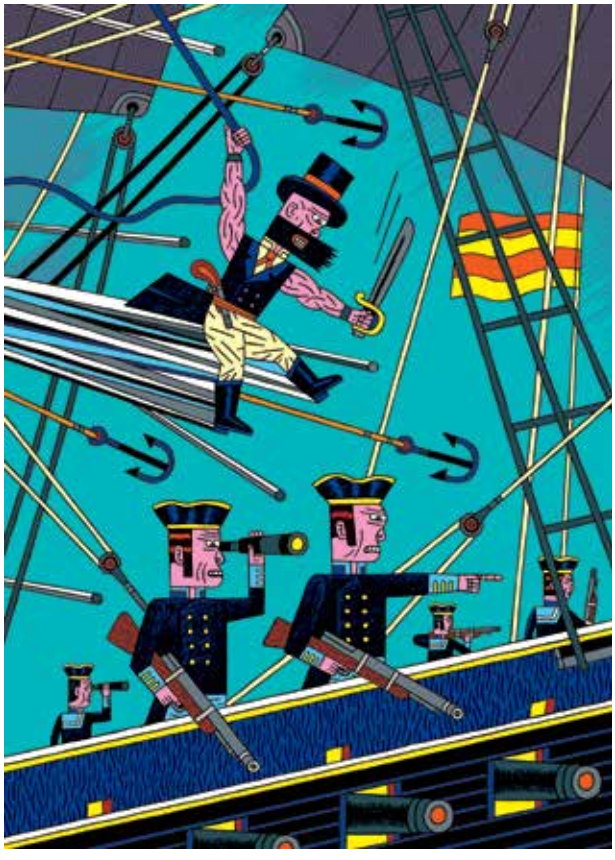
Images courtesy of Anke Feuchtenberger

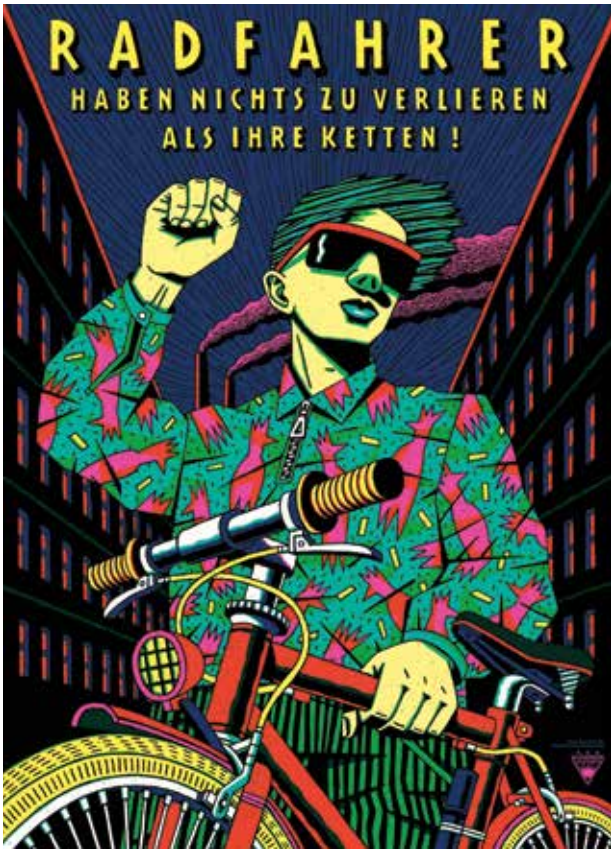
OUR INCREASING FLUENCY WITH VISUAL MEDIA SUCH AS PHOTOS, INFOGRAPHICS, VIDEOS, AND MORE MIGHT BE PART OF THE REASON THAT COMICS SEEM MORE APPROACHABLE TO MAINSTREAM READERS TODAY. EITHER WAY, VISUAL COMMUNICATION—INCLUDING COMICS AND GRAPHIC NOVELS—SEEMS LIKELY TO ONLY INCREASE IN IMPORTANCE AND PROMINENCE IN THE FUTURE.

BORN IN EAST GERMANY, ARTIST ANKE FEUCHTENBERGER (featured here) USES SURREALISM, COLOR, AND ATMOSPHERIC DETAILS TO ACHIEVE UNIQUE EFFECTS. "TRAINED UNDER THE DOCTRINES OF SOCIALIST REALISM… AND WORKING WITHOUT AN ESTABLISHED COMICS CANON," LSA ALUMNA ELIZABETH NIJDAM WRITES, "FEUCHTENBERGER PUSHED GERMAN COMICS INTO A NEW REALM."

Images courtesy of Henning Wagenbreth

COMICS CREATOR AND ILLUSTRATOR HENNING WAGENBRETH, WHOSE WORK IS FEATURED HERE, COFOUNDED THE BERLIN ARTIST GROUP PGH GLÜHENDE ZUKUNFT WITH FELLOW EAST GERMAN-BORN ARTIST ANKE FEUCHTENBERGER AND TWO OTHER CREATORS IN 1989.





"This movement really began internationally with Art Spiegelman's *Maus*," Nijdam says. "Parts of *Maus* date back to 1973, but it didn't win the Pulitzer Prize until 1992. And that's when people were like, 'Whoa, you can talk about history in comics?' Spiegelman really changed that for everybody."

Nijdam founded the Transnational Comics Studies Group (TCSG), a Rackham Interdisciplinary Study Workshop, to connect comics studies scholars across U-M. Last year, the group brought 14 speakers to campus and worked closely with a graphic narrative class taught by Phoebe Gloeckner, an associate professor in the Stamps School of Art & Design and the creator of *Diary of a Teenage Girl*.

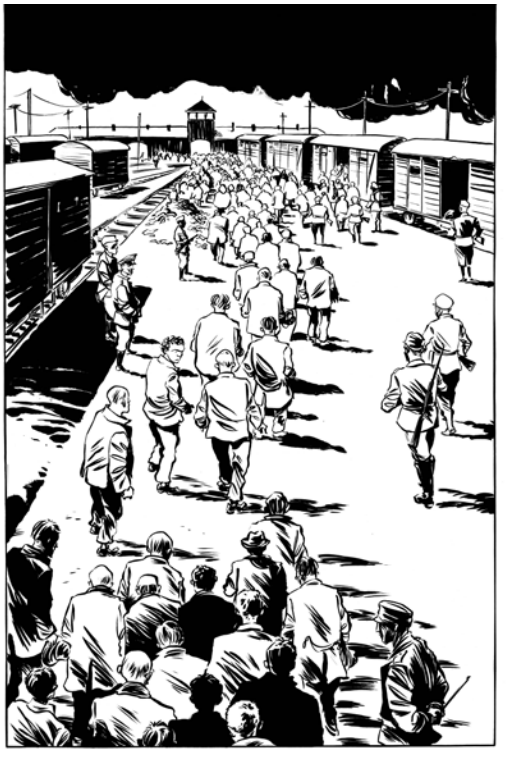
Now, Nijdam is a member-at-large for the Graduate Student Caucus of the Comics Studies Society and the secretary for the International Comic Arts Forum. She also won the prestigious Swann Foundation Fellowship from the Library of Congress, where she presented her research in May 2017, and received Rackham's Outstanding Graduate Student Instructor Award for her teaching with comics. She was recently awarded a postdoctoral fellowship that will allow her to live in Berlin for a year and work on her first book, a study of 12 contemporary German comics creators.

She says she is hopeful for the future of comics studies at U-M and around the world.

"I want to see the field continue to grow in an interdisciplinary fashion, and maybe one day have a center on campus," Nijdam says. "I know that a lot of our work has been really well received by lecturers, faculty, librarians, and graduate and undergraduate students. The audience for our lectures is really diverse. And I hope that these amazing things continue to happen at the University." ■

"FOR ME, HOW TO REPRESENT GERMAN HISTORY IS AN ESSENTIAL ASPECT OF THE COMICS SCENE IN GERMANY," SAYS ELIZABETH NIJDAM. CARTOONIST REINHARD KLEIST, WHOSE WORK IS SHOWN HERE, USED MANGA-STYLE ART TO TELL THE STORY OF HARRY HAFT, A BOXER AND CONCENTRATION CAMP SURVIVOR, IN THE GRAPHIC NOVEL *THE BOXER*.

⊕ EVEN MORE COMICS ON P. 48!



(THIS PAGE) Images courtesy of Reinhard Kleist; (RIGHT) Todd Davidson/Getty Images

SIRI IS ALWAYS listening, at the ready in case we call her name. Wireless-connected medical devices allow doctors to reprogram equipment like pacemakers without surgery. Computer code controls electric wheelchairs, autonomous cars, door locks, garage door openers, refrigerators, light bulbs, thermostats, DVD players, and more unexpected products every minute.

This is the world of networked devices and appliances: the Internet of Things (IoT).

Hacking IoT devices is easy. Their internet connection allows infiltration by remote access. They're also designed to link up with one another seamlessly, which allows a breach at one weak point to affect an entire network.

And those weak points aren't hard to find. Companies that create smart devices often have little incentive to design strong security into their products. For example, many devices leave the factory with the exact same default password. Few people know or bother to change it after they leave the store and install the device in their home.

ALUMNI BY ELIZABETH WASON

Keeping Bugs Out of the System

Can biology teach us how to keep computer systems secure?

EARLY ON, HOLLAND REALIZED THAT APPLYING DARWIN'S IDEAS OF NATURAL SELECTION TO COMPUTER PROGRAMS COULD ALLOW SOFTWARE TO EVOLVE INTO BETTER VERSIONS OF THEMSELVES.

A clever hack can exploit the literally billions of IoT devices that connect urban communities across the United States, spreading an attack across devices in no time flat. It's like a virus infecting a community of organisms. That's why Stephanie Forrest (M.S. 1982, Ph.D. '85) says, "I argue to my computer science friends that biology is the true science of security."

Forrest, now a computer science professor at Arizona State University and an external professor at the Santa Fe Institute, earned her Ph.D. with John Holland (M.A. 1954, Ph.D. '59). Holland himself received the first Ph.D. in computer science granted by U-M and became one of the first professors in LSA's Department of Computer and Communication Science. He also taught in LSA's Psychology Department and Center for the Study of Complex Systems before passing away in 2015.

Early on, Holland realized he could apply Darwin's ideas about natural selection to computers by imagining the computing language of binary code – strings of ones and zeros – as genes, which could then evolve into better versions of themselves. He called these genetic algorithms.

JOHN HOLLAND'S CREATIVE IDEAS LED TO CYBERSECURITY SOLUTIONS BEFORE ANYONE EVEN KNEW THAT CYBERSECURITY WOULD BE A PROBLEM.

Today, Forrest takes a similar approach. She applies genetic algorithms to software, so the software itself can evolve into more efficient or less hackable versions. She thinks we can design better computer security systems if our understanding of biological defense inspires our solutions.

Both cybersecurity and biology involve attackers and defenders, predators and prey. And similar observations apply in both cases. For example, diverse ecosystems tend to bounce back to health after a disturbance, while biologically homogeneous environments are not as resilient. By the same logic, if everyone uses a different computer or internet browser, the community isn't as vulnerable to virus attacks.

But Forrest admits that staying secure is a challenge, because attackers continually innovate and devise new attacks. Defending against these attacks requires continual adaptation and repair of software bugs. The work involved can be intense and expensive, and sometimes vulnerabilities in the code remain undiscovered or unrepaired. Companies like Google have set up "bug bounty" programs, which offer rewards to conscientious coders who report major bugs before hackers can exploit them.

Forrest and her colleagues have pioneered another approach based on Holland's genetic algorithm, which automates the software repair process.

It works like this: Different computer program versions can mate. Mating merges the code of the different program versions, producing new combinations and functions that sometimes work better than the originals. Low-quality versions die. The quality of each version depends on how well it performs the function it was programmed to do. The process boosts promising variants and kills off the code that doesn't work as well. Mutations also come into play, an element of randomness that allows for unexpected innovation. The genetic algorithms that fuel this mating process – basically selective breeding and artificial adaptation, with computers – are superfast and require little human intervention.

"It doesn't always fix bugs the way *you* might," says Forrest, "But it often fixes them."

Because it's automated, Forrest's program, or something like it, would be cheaper and more efficient than waiting for humans to manually repair software bugs.

Keeping ourselves and our digital devices safe as the IoT grows and evolves requires vigilance, strong computer code, and an investment in safeguarding the devices that go to market. The vulnerability of our devices reflects our own vulnerability.

In this digital form of survival of the fittest, we are only as strong as the weakest programmer. ■

(LEFT) Doug Coombes; (RIGHT) Hunter Zhao

Double Duty

An ambitious student completed not one but two prestigious summer internships — all while learning to find his path with support from the LSA Opportunity Hub.

DURING ON-SITE ORIENTATION for his summer internship at the U.S. Department of State, LSA senior Hunter Zhao talked to a lot of fellow interns whose families had ties to politics. There were interns with parents who worked on "the Hill" and interns whose parents worked at political think tanks and interns whose parents worked in the Foreign Service. Zhao's background was a little different.

At the State Department orientation, Zhao explained that his parents worked at a restaurant. "So why are you interested in this?" the other interns asked.

"You kind of stumble into these conversations," Zhao says, "and I think it adds a whole different dimension to places like the State Department to bring in people who wouldn't have had access to it without the kind of support that I got from the LSA Opportunity Hub."

"The LSA Opportunity Hub and the financial support that it provides our students is a great leveler," says Dean Andrew D. Martin, who counts the Hub as one of the largest and most significant initiatives he has taken on as dean. "It's an empowering institution that is making sure that our least privileged student coming in the door can have the same experience as that of the most privileged student."

The LSA Opportunity Hub, which opened last fall, offers critical guidance and coaching to liberal arts students on how to connect what they're learning in the classroom to their goals and aspirations. This includes a wide range of services including internships, mentorship, specialized classes, and financial

LSA STUDENT HUNTER ZHAO GETTING A GOOD LOOK AT THE BIJELA TABIJA ("WHITE CASTLE") HISTORICAL DISTRICT IN SARAJEVO. ZHAO INTERNED AT THE POST-CONFLICT RESEARCH CENTER OVER THE SUMMER.

support, giving students the opportunity to develop skills and construct networks that will help them build their lives and careers after graduation.

"I would like all undergraduate students in LSA to get to the point where they're really enjoying the ride," Martin says. "To throw themselves into their studies, to focus on whatever they're most passionate about, whatever they find most fascinating and interesting and to not have any anxiety about what's going to happen when they get their degree. One of the goals of the LSA Opportunity Hub is to empower students in that way and to encourage them through the Hub's courses and curriculum to be self-reflective."

"Students can learn so much from their experiences with some thought and support," says Paula Wishart, the assistant dean of student development and career initiatives and leader of the LSA Opportunity Hub team. "An internship is a great example. What happened over the summer that had meaning, what skills did students develop, what people did they meet? Students often say, 'I had a great summer,' and that's where it ends. Just radio silence until the next year. We encourage students to reflect, to take action, to follow up. And there are a lot of ways the Hub can support students doing that."

Zhao's position at the State Department was actually his second internship for the summer. He also worked for the Post-Conflict Research Center in Bosnia and Herzegovina immediately prior to his work for the U.S. government. In Sarajevo, he wrote articles and interviewed migrant workers and small business owners about international movement and economic hardship. Zhao only got three days at home with his family between returning from Europe and flying to Washington, D.C.

"I hate using the word busy," Zhao says. "But when I was doing that second internship in D.C., I always felt like I should have been more tired than I felt. But it was all just such an adrenaline rush that I never had that feeling of being exhausted, of being overwhelmed."

Zhao wants to continue working and exploring public policy after graduation. He'd like to either do a Fulbright or join the Peace Corps and eventually get an advanced degree in the field, working to further understand and improve the world.

"I am maximizing the opportunities available," Zhao writes in a blog post for the LSA Opportunity Hub. "I want to do well in college so that I can chase my dreams and honor my family." ■

The LSA Opportunity Hub helps students make the most of their time at Michigan by preparing them to reach their goals at every step along the way. **Here's how they do it:**

1 COACHING AND PREPARATION

The Hub helps students find ways to connect what they're learning inside the classroom with the possibilities that lie outside it. By using one-on-one meetings, group workshops, and courses to prepare them for getting the most from an internship, the Hub helps them think through what they want to do, then helps them do it.

2 INTERNSHIPS AND EXPERIENCES

The Hub helps students find internships and other outside-the-classroom experiences, like fellowships or research assignments. Business, education, finance, communication, arts, healthcare, technology, natural sciences, and public policy are all areas in which the Hub is cultivating opportunities, especially with LSA alumni.

"As a first-generation college student with limited Chinese vocabulary, I've never been able to truly talk about my dreams with my parents."

–HUNTER ZHAO

BY HUNTER ZHAO

THIS ISN'T ABOUT MY INTERNSHIP, IT'S ABOUT MY MOM AND DAD.

I'm going to be honest with myself. It's impossible to truly hash out my experience in the Western Balkans without taking the time to write about a part of my life back in Muskegon. My parents actually have no idea what I'm doing in Sarajevo, and I've felt strangely guilty leaving them in the dark. I spent three days back home after my finals before flying across the Atlantic. There are two main reasons that they wouldn't understand. First, I have no clue how to describe post-conflict research in my elementary Taishanese. And second, they never went to college.

As a first-generation college student with limited Chinese vocabulary, I've never been able to truly talk about my dreams with my parents. We discuss simple things: how to live a healthier life, shenanigans that my older brother keeps getting into, whether I'm eating enough. When I'm tired of conversations over how to cook *juk* or *men fun*, I attempt to struggle through a conversation over my future after school. To have some understanding, I tell them I want to be a teacher. My mom tells me, "Being a teacher is a good career for a soft heart like yours." I always agree.

But I actually want to be a policymaker in the field of international migration and am also considering a career in the Foreign Service. I wish could explain all of that to my parents.

My parents have never put any pressure on me to study a particular field, nor have they offered any advice on which fields I should pursue. It's not because they don't want me to follow my passions; it's because they just don't know what to say. According to my dad, whatever I will be in the United States — even if I wait tables like my mom does now — will be better than anything I could have done back in rural Taishan. When I told them that I would be working in Bosnia and Herzegovina during the summer, they had never heard of the country. "I'm helping my teacher over the summer," I said to them. They think it's great that my teacher likes me.

I have so much respect for my parents, and our relationship has always been rooted in trust. I trust that they are working hard to support my brother and me while they trust that I am maximizing the opportunities available. I want to do well in college so that I can chase my dreams and honor my family.

3 FUNDING

Part of the Hub's ethos is the belief that every student should have access to the same opportunities, so the Hub helps cover the costs that come with an internship, like housing, airfare, and food. Last year more than $1 million was awarded to help cover internship costs.

4 CONNECTIONS

U-M students have access to one of the largest alumni networks in the world and people who are working every field — in tech, marketing, consulting, medicine, and beyond. The Hub helps them expand their network and build real relationships within it.

Follow @UMichLSAhub on and visit our website, lsa.umich.edu/opportunityhub.

LETTERS

We received an unprecedented number of responses to "Student Union," our article on the founding of the Comprehensive Studies Program that we ran in the spring 2017 issue of *LSA Magazine*. Messages came by email, by phone, by text message, and through the U.S. post office. Many were memories from alumni who had participated in the Black Action Movement, or recollections of what it felt like to be on campus during that era. Some people told us what they had gone on to do to make the world a more equitable place.

Gayle Pollard Terry (A.B. 1972). A proud student participant in the BAM strike at U-M in 1969.

TALK TO US

We invite your feedback on *LSA Magazine*. Letters for publication may be edited for style, length, and clarity.

Email: lsamagazine@umich.edu

Or write to:
Editor, *LSA Magazine*
101 North Main Street, Suite 850
Ann Arbor, MI 48104

After I left Michigan, I moved to Oakland, California, with U-M alumnus Thomas "Amar" Casey (B.G.S. 1974). We had both helped to lead and participated in the BAM Strike. We began to work as teachers at the Intercommunal Youth Institute, popularly known as the Oakland Community School. The school was founded by Huey P. Newton and Bobby Seale who were Black Panthers.

KAYE WASHINGTON (A.B. 1973)

Regarding the BAM Strike:

Crying, I called my father from a payphone in Couzens Hall during the Black Action Movement strike. "Daddy, I think we are going to get arrested." He paused. "Do you believe in what you are fighting for?" he asked. "Yes, sir." Without hesitating he said, "Then daddy will come get you and your friends."

Four black students had been arrested earlier that day during our demonstration outside of the Administration Building. T.R. Harrison, a freshman, and Michael "Happy" Marsh, a sophomore and my classmate, were good friends.

My father, William B. Pollard (M.P.H. 1938), knew I was on the steering committee of the Black Student Union. Fighting for better treatment of black people was a family tradition. My parents, public school educators, were paying my hefty out-of-state tuition and housing because they believed if I got a scholarship or financial aid, "a poor Negro won't be able to go to Michigan."

I am proud of my participation in the BAM strike. (That's me in the polka-dot scarf, Afro, and glasses.) I am also thankful for the lessons I learned inside and outside of the classroom at Michigan.

GAYLE POLLARD TERRY (A.B. 1972)

(RIGHT) SpaceX

ALUMNI BY ELIZABETH WASON

Just Colonizing Other Planets, No Big Deal

"I believe that the human species should be multiplanetary," says LSA alumnus Bryan Mazor. "It's only a matter of when."

BRYAN MAZOR (B.S. '14) talks about populating other planets like it's inevitable. So does Elon Musk, who founded the company SpaceX, where Mazor works as a solar array engineer.

"Ultimately, I'm an explorer and a physicist," says Mazor. "I want to go to Mars. It'd be fun to be the John Muir of Mars. Just go there, explore, and get mountains named after you."

The prospect of exploring unknown lands has pretty much ended here on Earth. The red planet may offer our next best viable chance to have such adventures, and a main objective of SpaceX is to engineer affordable rocket transportation so people can really go. Maybe the SpaceX passion has proved contagious: This year's team of NASA astronauts came from a pool of 18,300 applicants, the biggest since NASA began.

The other driving mission of SpaceX? To populate Mars with at least one million people in what ultimately will become a self-sufficient community, which would persist in the case of human extinction on Earth.

The plan to colonize Mars in case of emergency is "like doom and gloom," Mazor admits, and even a bit wild. But Mazor believes that desperate times call for desperate measures. "In the short amount of time we've been on the Earth, we've managed to go to the moon, but we've also been able to heat this place up by a couple degrees and possibly make living here a lot more complicated," he says.

Part of the solution is sustainability. And Elon Musk's trifecta of companies—which includes SpaceX, Tesla, and SolarCity—interweaves it right into the business plan. SpaceX will build reusable rockets rather than dump single-serve spacecraft after every launch, which cuts down costs in a major way. "We're trying to keep it as cheap as possible," says Mazor.

"The landings we do are still shell-shocking," Mazor marvels about SpaceX. "This 140-foot rocket can land itself on a small boat! Those are some of the most amazing things I've seen."

And Tesla's electric cars consume sustainable energy that SolarCity helps create. Zero-emission electric cars, especially if charged through the solar grid, don't contribute to climate change the way gas engines do. "Electric motors can become 98 percent efficient," says Mazor, "whereas in a gasoline motor, efficiency and transmission averages something like 20 percent." An efficient electric motor makes a cost-effective car, which gets even cheaper because Elon Musk promises that Tesla

(BOTTOM AND TOP RIGHT) SpaceX; (BOTTOM RIGHT) Michigan Engineering

"WHEN I'M JUST SITTING AROUND IN THE GRASS UNDER A TREE OR SOMETHING, MY MIND GRAVITATES TO PHYSICS PROBLEMS."

CONSISTENT WITH ITS SUSTAINABLE USE OF SOLAR ENERGY, A MAJOR GOAL OF SPACEX IS TO BUILD AND LAUNCH REUSABLE ROCKETS.

charging stations will operate for free forever.

Mazor makes reliable solar arrays that power SpaceX.

"Less than five percent of our society is farmers—people actually feeding each other—and it's nuts that a very small percentage of our society can feed everybody," he says. "If you carry that analogy to a spacecraft, our solar team is kind of like the farmers. Solar arrays are where the energy and power come from to run everything. Batteries are like storage silos."

"The reason gasoline motors persisted for such a long time is the energy storage," Mazor says. "It was more efficient to store energy in chemical bonds and gasoline than it was in battery packs. So in the 1920s, it was a technological maturity problem. Internal combustion engines prevailed because battery technology was lagging."

Mazor knows about harvesting solar energy based on a few years of experience racing on the U-M Solar Car Team as an undergraduate studying physics. His roles on the team called for both physics and engineering expertise, and he was up for the challenge.

"I thought about transferring to engineering when it became more apparent that I was interested in it. But ultimately, I just love physics," says Mazor. As a kid, Mazor and his family would often lapse into deep conversations about science and math around the dinner table. "When I'm just sitting around in the grass under a tree or something, my mind gravitates to physics problems.

"At SpaceX, we are advancing technology in a lot of different realms, and hopefully some of those advances can help attack climate change. We're reducing the activation energy to get into space and making space more accessible. We're trying to make it so cheap to go to Mars that people's imaginations can extend there, and we can start thinking of creative ways to make society better.

"We're trying to open up people's imaginations. What if you could fly a satellite? What would you fly? If you could go to Mars, what would you do? We are trying to make all of that real." ■

BRYAN MAZOR (pictured second from left) HELPED LEAD THE SOLAR CAR TEAM AS BOTH AN LSA STUDENT AND ALUM. HE AND A GROUP OF SOLAR CAR TEAM ALUMNI WON AN INTERNATIONAL RACE IN ABU DHABI BY A MERE 2.5 MINUTES IN THE *QUANTUM* CAR.

We, Mycelf, and I

Ramaswami Mahalingam thinks cellphones are so enmeshed in our lives they have altered our sense of identity, making us our *celves* instead of ourselves.

EVERY CULTURE HAS an idea of what it means to be magnanimous, says Professor of Psychology and Women's Studies Ramaswami Mahalingam. "In my native language, it means to be a big-hearted person—that's the direct translation. In our culture, that's where the magnanimity is, in the interconnected self."

By interconnected self, Mahalingam means having an emotional connection to the places and people around you. He also means making a connection to the world through your cellphone.

Cellphones are ubiquitous, indispensable, and they often get a bad rap, Mahalingam says. "The anti-cellphone camp laments that people are not talking to each other anymore, that people are constantly texting, that there's a disconnect," he says. "The other camp says cellphones make people more connected because they send each other pictures and catch up with friends on Facebook. They say our cellphones are actually good for us."

The truth, of course, is more complicated. It's not surprising that what you do with your cellphone determines if it will have a positive or negative effect on your life. It may come as a surprise that Mahalingam's research finds that whether you get a positive or a negative effect from your phone is partly dictated by how mindful and attentive you are when you are using it.

I TEXT, THEREFORE I AM

Mahalingam sees cellphones as portals through which we can create, transmit, and archive all of our various selves. They contain all of our identities—our professional selves and our romantic involvements and our private penchants for Scrabble or '80s TV. As our phones have fused our diverse identities into a single device, they have created a state of hyperconnectivity. Everyone we've ever known and every place we've ever been is likely available, in some way, through our phones.

Cellphone technology has stripped away the time and distance the physical world once inserted between our various selves. Without it, we can, in theory, almost always be reached, and that quickly becomes exhausting.

Technology's omnipresence isn't going to fade anytime soon. As phones become smarter and more sophisticated, the notion that technology can actually merge with our bodies takes cyborgs out of science fiction and puts them into the not-too-distant future. Mahalingam believes this transition is already underway.

Apps, Mahalingam says, are already mediating human experiences. Our memories no longer live exclusively in our heads, and a fact we might once have held in our memories we now access through our phones. Mahalingam says that these changes aren't necessarily a bad thing.

"On the one hand, there is a humanistic impulse to say, 'Oh, it's awful. The machines are in control,'" he says. "But the challenge lies in creating an awareness about how you think about everything, so when you do something habitual you become much more aware of it. As you become more deliberate, you use the phone more deliberately, too."

One example that Mahalingam uses is the connection between cellphones and social comparison. If you scroll through Facebook or Ins-

Gregory Baldwin/Getty Images

tagram, for example, you might start thinking about how you measure up to other people in your feed, which research has found often leaves people feeling depressed.

"If you become more mindful of the connection between feeling sad and looking at Facebook, you become attuned to other social comparisons, too," he says. The same is true for noticing generosity or kindness—the more attention you bring to bear on a thing, the more you notice it happening around you. And because cellphones are always with you, you can load apps that can prompt you throughout your day to notice and record thoughts or feelings and what's happening around them. You can create an objective dataset you can use to guide your decisions. Such data open avenues for social research, too.

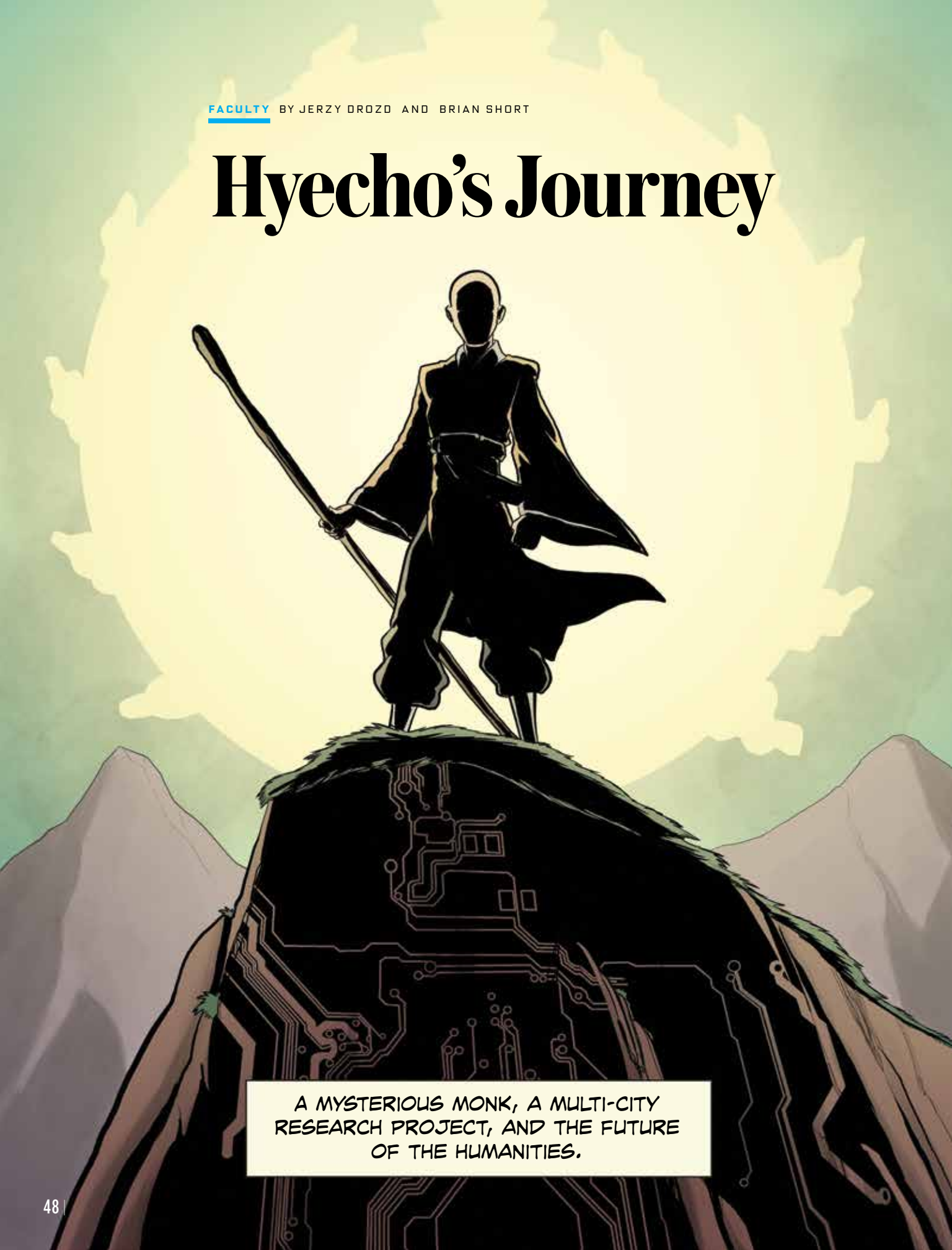
Mahalingam teaches a mindfulness class to undergraduates that stresses, among other things, mindful texting and noticing generosities around them. The effect of being more intentional about their phones means that students feel less compelled to look at their phones, which gives them more brain space to think about other things or connect more deeply with the person sitting next to them – not to mention engage with their studies.

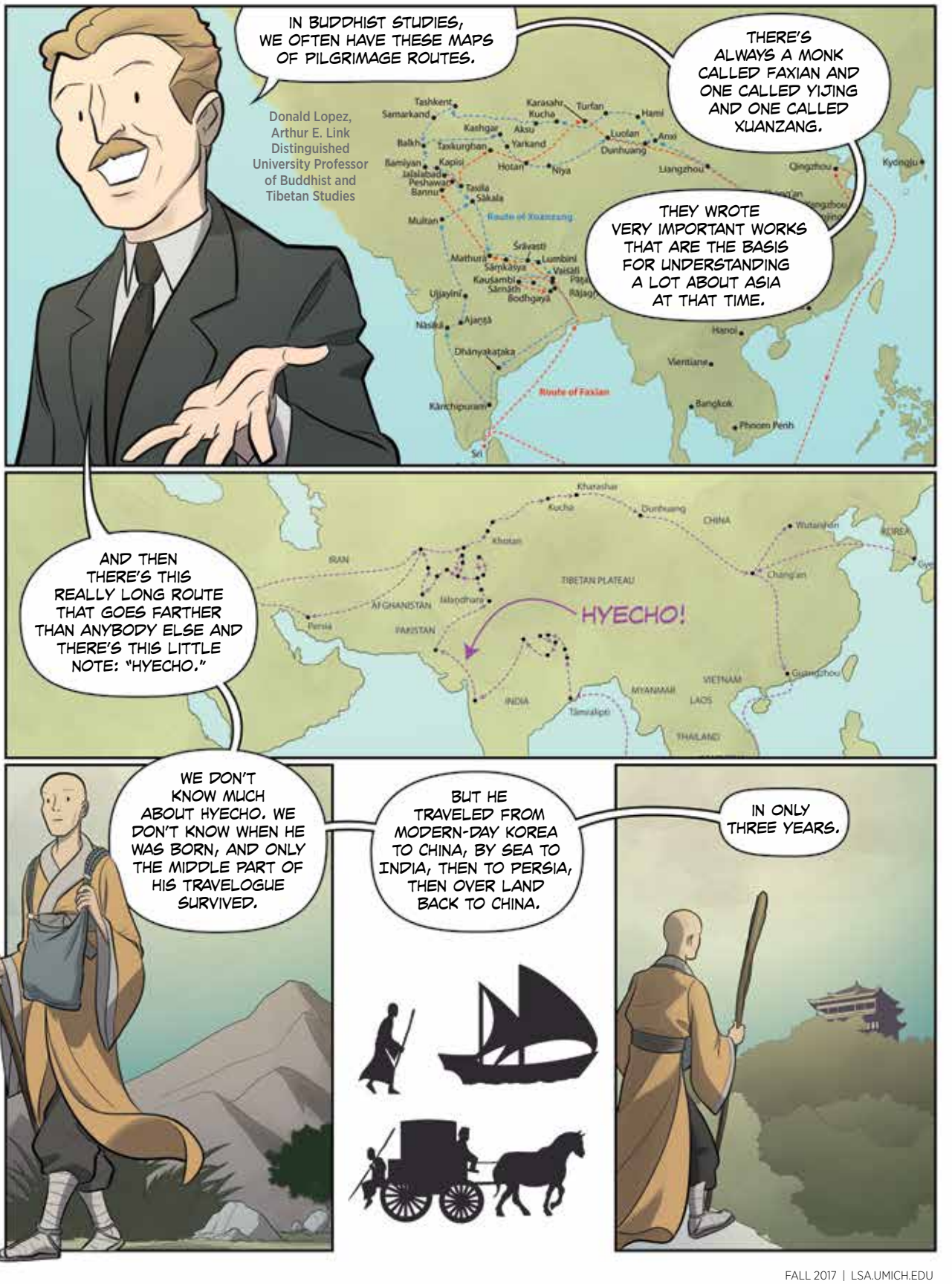
"Ultimately, technology creates a broader set of tools to foster interconnection," Mahalingam says. "It should help us see the expanse of who we are, and to adapt to changes with magnanimity and grace." ■

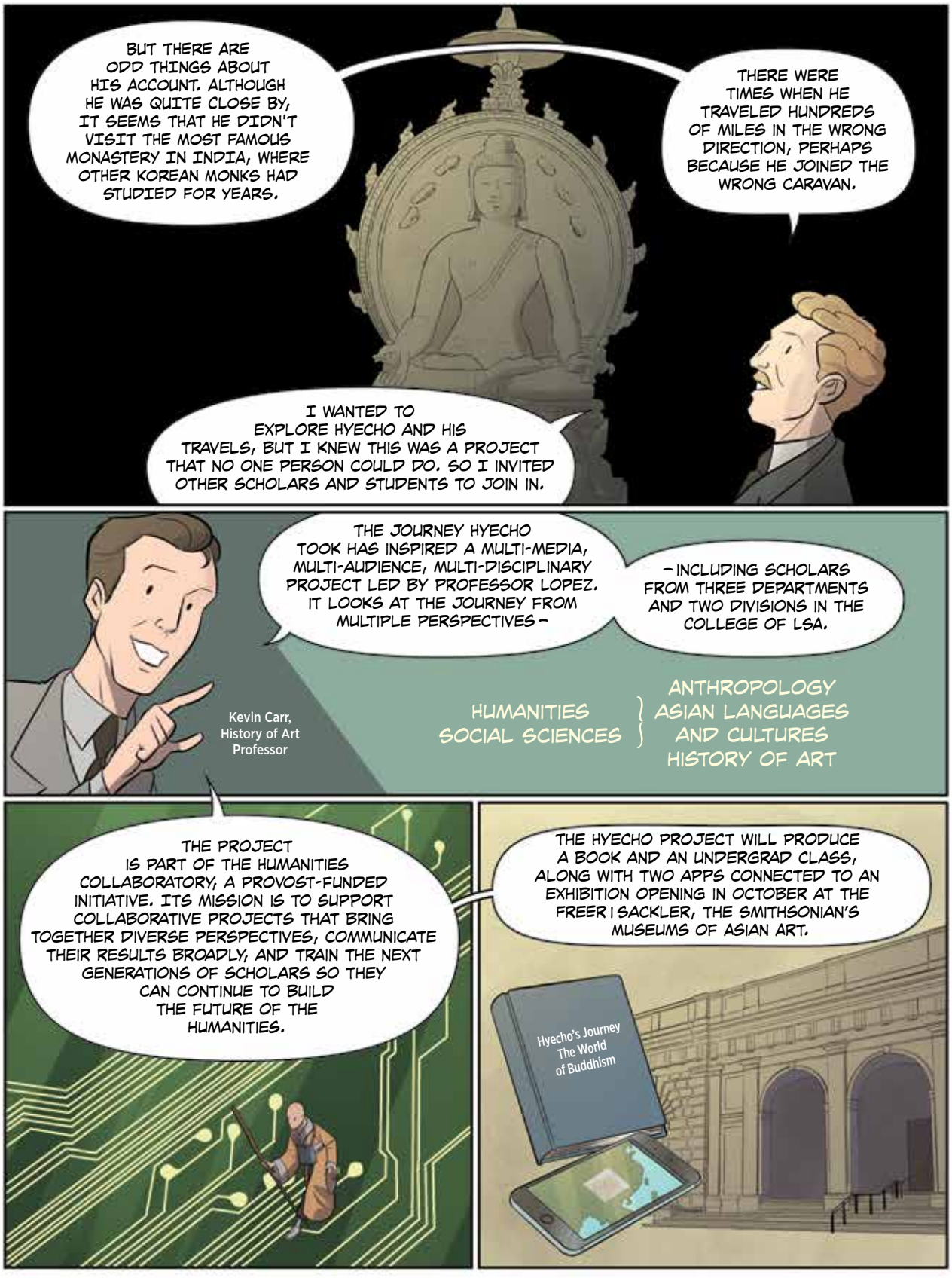
CELLPHONE TECHNOLOGY HAS STRIPPED AWAY THE TIME AND DISTANCE THE PHYSICAL WORLD ONCE INSERTED BETWEEN OUR VARIOUS SELVES.

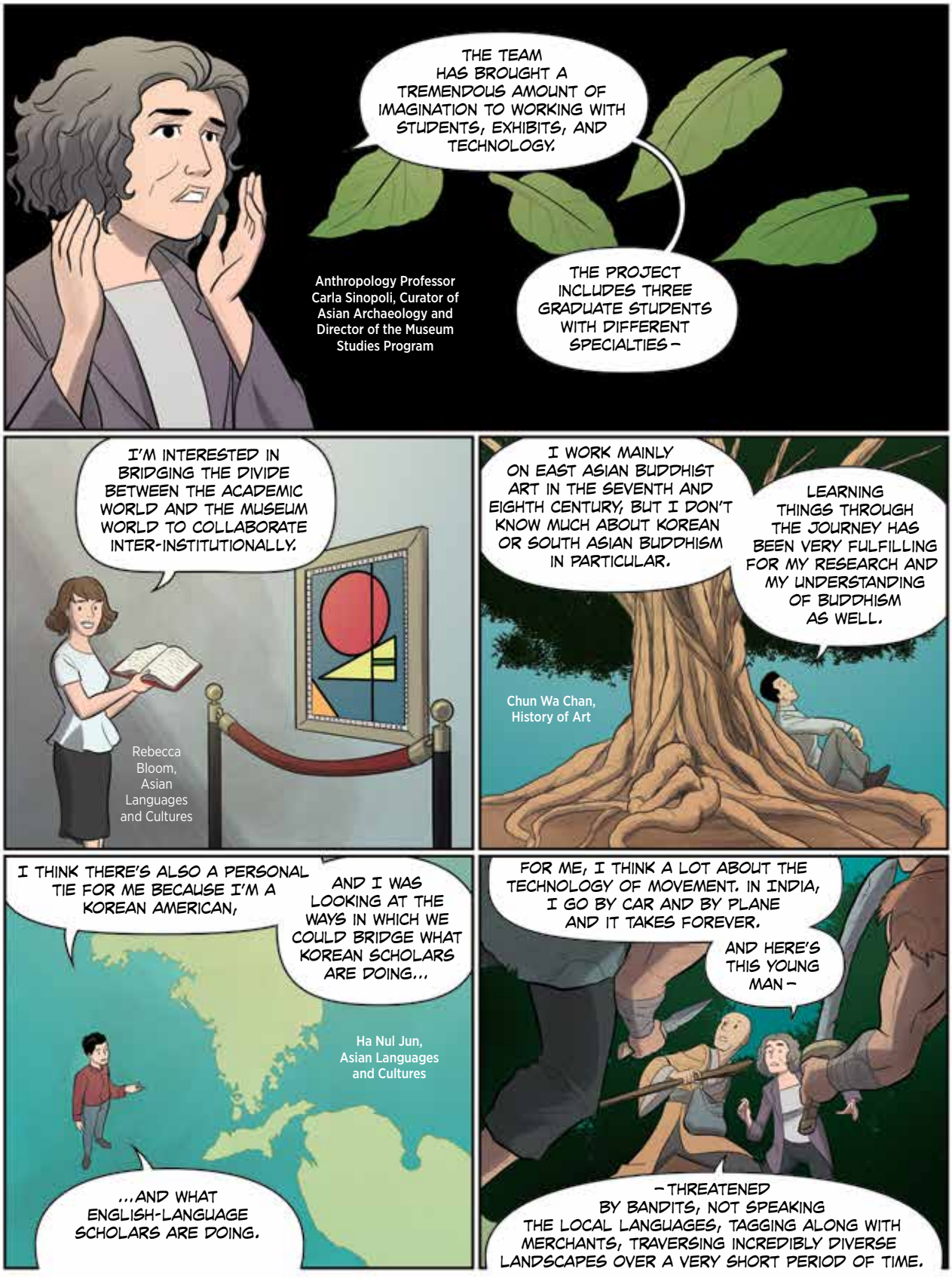
FACULTY BY JERZY DROZD AND BRIAN SHORT

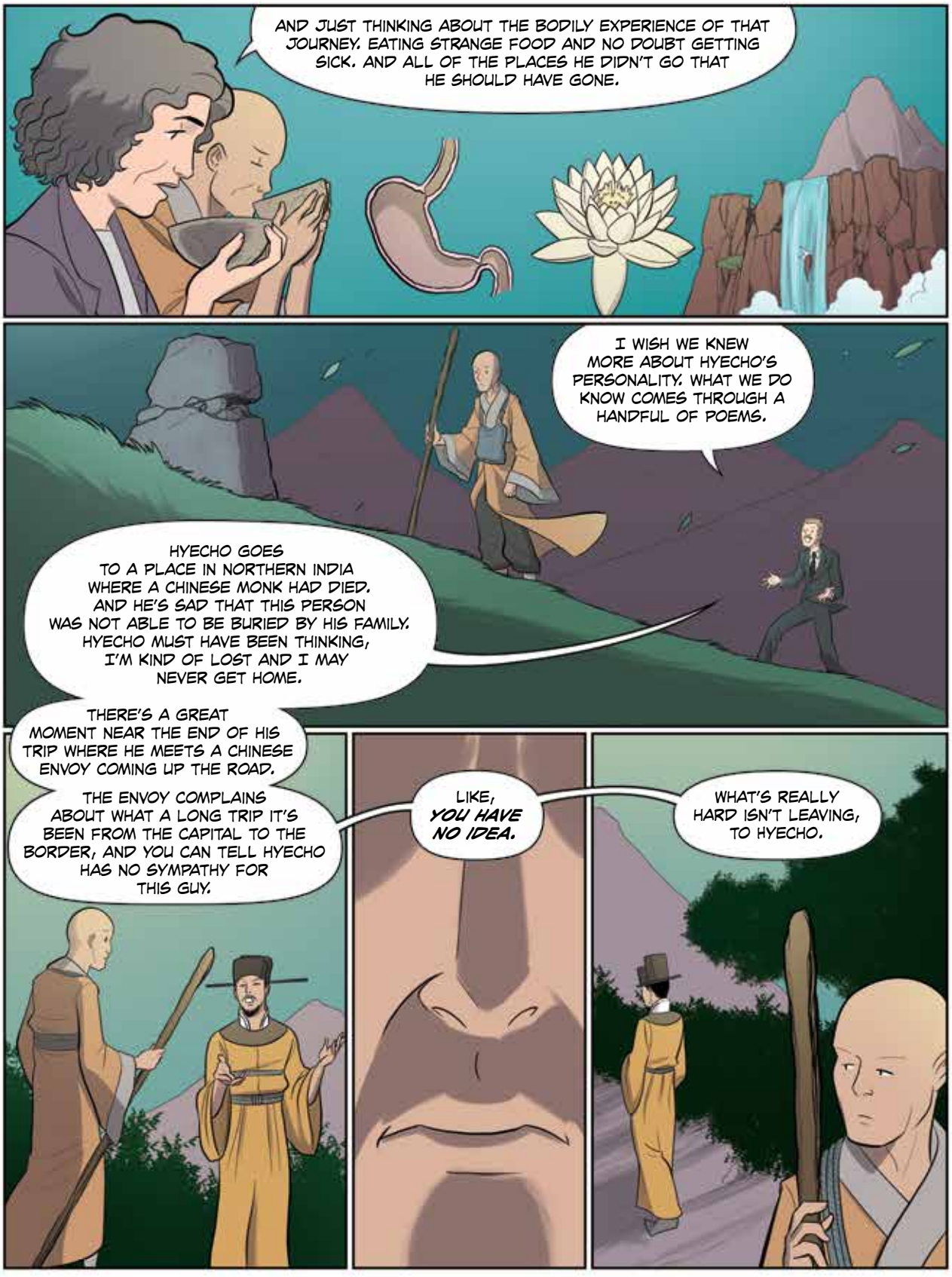
Hyecho's Journey

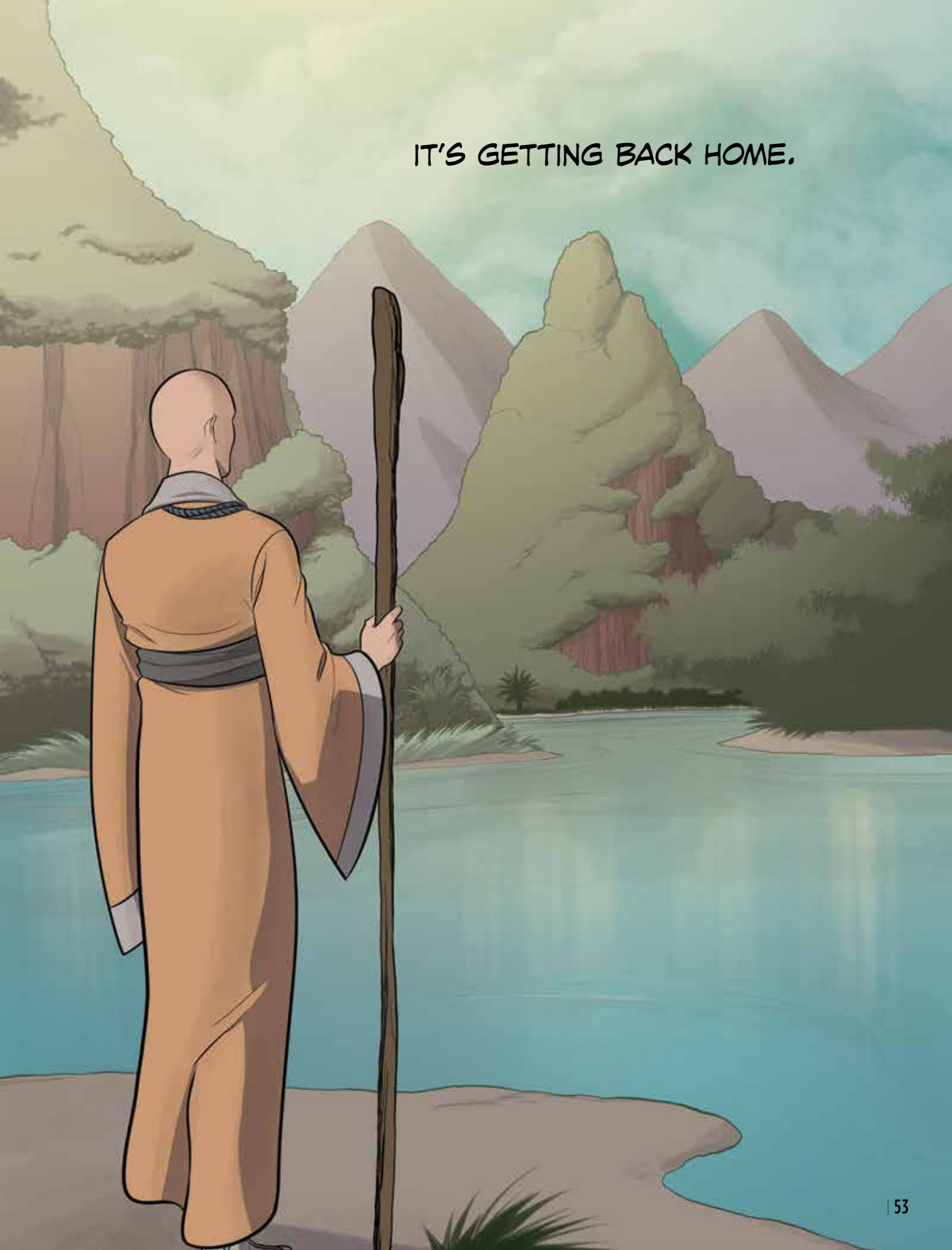



IN BUDDHIST STUDIES, WE OFTEN HAVE THESE MAPS OF PILGRIMAGE ROUTES.
Donald Lopez, Arthur E. Link Distinguished University Professor of Buddhist and Tibetan Studies
THERE'S ALWAYS A MONK CALLED FAXIAN AND ONE CALLED YIJING AND ONE CALLED XUANZANG.
THEY WROTE VERY IMPORTANT WORKS THAT ARE THE BASIS FOR UNDERSTANDING A LOT ABOUT ASIA AT THAT TIME.
Tashkent
Samarkand
Karasahr
Kucha
Turfan
Hami
Kashgar
Aksu
Luolan
Anxi
Balkh
Yarkand
Dunhuang
Bamiyan
Kapisi
Hotan
Niya
Liangzhou
Qingzhou
Kyongju
Jalalabad
Peshawar
Bannu
Taxila
Sakala
Route of Xuanzang
Multan
Śrāvastī
Mathurā
Lumbini
Saṃkāśya
Vaiśālī
Kauśambī
Sārnāth
Bodhgayā
Ujjayinī
Nāsika
Ajaṇṭā
Hanoi
Dhānyakaṭaka
Vientiane
Route of Faxian
Kāñchipuram
Bangkok
Phnom Penh
Sri
AND THEN THERE'S THIS REALLY LONG ROUTE THAT GOES FARTHER THAN ANYBODY ELSE AND THERE'S THIS LITTLE NOTE: "HYECHO."
Kharashar
Kuchā
Dunhuang
CHINA
Wutaishān
KOREA
Khotan
IRAN
TIBETAN PLATEAU
Chang'an
Jalodhara
AFGHANISTAN
HYECHO!
Persia
PAKISTAN
Guangzhou
VIETNAM
MYANMAR
LAOS
INDIA
Tāmralipti
THAILAND
WE DON'T KNOW MUCH ABOUT HYECHO. WE DON'T KNOW WHEN HE WAS BORN, AND ONLY THE MIDDLE PART OF HIS TRAVELOGUE SURVIVED.
BUT HE TRAVELED FROM MODERN-DAY KOREA TO CHINA, BY SEA TO INDIA, THEN TO PERSIA, THEN OVER LAND BACK TO CHINA.
IN ONLY THREE YEARS.


BUT THERE ARE ODD THINGS ABOUT HIS ACCOUNT. ALTHOUGH HE WAS QUITE CLOSE BY, IT SEEMS THAT HE DIDN'T VISIT THE MOST FAMOUS MONASTERY IN INDIA, WHERE OTHER KOREAN MONKS HAD STUDIED FOR YEARS.
THERE WERE TIMES WHEN HE TRAVELED HUNDREDS OF MILES IN THE WRONG DIRECTION, PERHAPS BECAUSE HE JOINED THE WRONG CARAVAN.
I WANTED TO EXPLORE HYECHO AND HIS TRAVELS, BUT I KNEW THIS WAS A PROJECT THAT NO ONE PERSON COULD DO. SO I INVITED OTHER SCHOLARS AND STUDENTS TO JOIN IN.
THE JOURNEY HYECHO TOOK HAS INSPIRED A MULTI-MEDIA, MULTI-AUDIENCE, MULTI-DISCIPLINARY PROJECT LED BY PROFESSOR LOPEZ. IT LOOKS AT THE JOURNEY FROM MULTIPLE PERSPECTIVES –
– INCLUDING SCHOLARS FROM THREE DEPARTMENTS AND TWO DIVISIONS IN THE COLLEGE OF LSA.
Kevin Carr, History of Art Professor
HUMANITIES
SOCIAL SCIENCES
ANTHROPOLOGY
ASIAN LANGUAGES AND CULTURES
HISTORY OF ART
THE PROJECT IS PART OF THE HUMANITIES COLLABORATORY, A PROVOST-FUNDED INITIATIVE. ITS MISSION IS TO SUPPORT COLLABORATIVE PROJECTS THAT BRING TOGETHER DIVERSE PERSPECTIVES, COMMUNICATE THEIR RESULTS BROADLY, AND TRAIN THE NEXT GENERATIONS OF SCHOLARS SO THEY CAN CONTINUE TO BUILD THE FUTURE OF THE HUMANITIES.
THE HYECHO PROJECT WILL PRODUCE A BOOK AND AN UNDERGRAD CLASS, ALONG WITH TWO APPS CONNECTED TO AN EXHIBITION OPENING IN OCTOBER AT THE FREER|SACKLER, THE SMITHSONIAN'S MUSEUMS OF ASIAN ART.
Hyecho's Journey
The World of Buddhism


THE TEAM HAS BROUGHT A TREMENDOUS AMOUNT OF IMAGINATION TO WORKING WITH STUDENTS, EXHIBITS, AND TECHNOLOGY.
Anthropology Professor Carla Sinopoli, Curator of Asian Archaeology and Director of the Museum Studies Program
THE PROJECT INCLUDES THREE GRADUATE STUDENTS WITH DIFFERENT SPECIALTIES –
I'M INTERESTED IN BRIDGING THE DIVIDE BETWEEN THE ACADEMIC WORLD AND THE MUSEUM WORLD TO COLLABORATE INTER-INSTITUTIONALLY.
Rebecca Bloom, Asian Languages and Cultures
I WORK MAINLY ON EAST ASIAN BUDDHIST ART IN THE SEVENTH AND EIGHTH CENTURY, BUT I DON'T KNOW MUCH ABOUT KOREAN OR SOUTH ASIAN BUDDHISM IN PARTICULAR.
LEARNING THINGS THROUGH THE JOURNEY HAS BEEN VERY FULFILLING FOR MY RESEARCH AND MY UNDERSTANDING OF BUDDHISM AS WELL.
Chun Wa Chan, History of Art
I THINK THERE'S ALSO A PERSONAL TIE FOR ME BECAUSE I'M A KOREAN AMERICAN,
AND I WAS LOOKING AT THE WAYS IN WHICH WE COULD BRIDGE WHAT KOREAN SCHOLARS ARE DOING...
Ha Nul Jun, Asian Languages and Cultures
...AND WHAT ENGLISH-LANGUAGE SCHOLARS ARE DOING.
FOR ME, I THINK A LOT ABOUT THE TECHNOLOGY OF MOVEMENT. IN INDIA, I GO BY CAR AND BY PLANE AND IT TAKES FOREVER.
AND HERE'S THIS YOUNG MAN –
– THREATENED BY BANDITS, NOT SPEAKING THE LOCAL LANGUAGES, TAGGING ALONG WITH MERCHANTS, TRAVERSING INCREDIBLY DIVERSE LANDSCAPES OVER A VERY SHORT PERIOD OF TIME.


AND JUST THINKING ABOUT THE BODILY EXPERIENCE OF THAT JOURNEY. EATING STRANGE FOOD AND NO DOUBT GETTING SICK. AND ALL OF THE PLACES HE DIDN'T GO THAT HE SHOULD HAVE GONE.
I WISH WE KNEW MORE ABOUT HYECHO'S PERSONALITY. WHAT WE DO KNOW COMES THROUGH A HANDFUL OF POEMS.
HYECHO GOES TO A PLACE IN NORTHERN INDIA WHERE A CHINESE MONK HAD DIED. AND HE'S SAD THAT THIS PERSON WAS NOT ABLE TO BE BURIED BY HIS FAMILY. HYECHO MUST HAVE BEEN THINKING, I'M KIND OF LOST AND I MAY NEVER GET HOME.
THERE'S A GREAT MOMENT NEAR THE END OF HIS TRIP WHERE HE MEETS A CHINESE ENVOY COMING UP THE ROAD.
THE ENVOY COMPLAINS ABOUT WHAT A LONG TRIP IT'S BEEN FROM THE CAPITAL TO THE BORDER, AND YOU CAN TELL HYECHO HAS NO SYMPATHY FOR THIS GUY.
LIKE, YOU HAVE NO IDEA.
WHAT'S REALLY HARD ISN'T LEAVING, TO HYECHO.


IT'S GETTING BACK HOME.

Renaissance Woman

Jennifer Tejada is a tech industry dynamo, but her background is pure liberal arts. And she says that's no coincidence.

JENNIFER TEJADA (A.B. 1993) had no idea what she was going to be when she grew up. She toyed with the idea of medicine, then with a possible career in healthcare administration. But her biggest interest was in the journey of learning itself. At LSA, Tejada dabbled in everything from political science to fiction writing, enamored with the worlds of knowledge that were opening up to her.

"I am from a small town, and going into the classroom and talking about places so different from what I knew was the gateway to gaining a more global perspective," says Tejada. "I became a person with a lot of wanderlust."

It was with that same sense of adventure that she agreed, almost off-handedly, to run for student government with her hall-mate during her first year at school. To her surprise, Tejada won, and she spent the next year as vice president of the LSA student government. Her experience there gave her an early perspective on leadership, requiring her to balance her personal goals with a commitment to bettering the lives of the students she represented.

"I learned as a volunteer that leadership is not just membership," says Tejada. "It's a responsibility, and pay is not always commensurate with effort. True leaders are not in it for the money. Rather, it's how we are wired."

Tejada also took life lessons from playing on the U-M women's golf team, where she gained an appreciation for

(LEFT) Courtesy of Jennifer Tejada; (RIGHT) Courtesy of the U-M Bentley Historical Library

teamwork, discipline, and good sportsmanship. Her experience also helped formulate her future leadership style.

"I realized that while I love competition, I don't enjoy a cutthroat environment," she says. "I am a collaborator and like winning as a team. I don't like to take the world too seriously."

Tejada also credits her membership in Adara, a secret society for female leaders on campus, with first showing her the power of women, which she's carried on into her career through mentorship and promotion of women in the industry.

"I learned we are better when we work together," says Tejada. "I realized the importance of helping other women, that reaching back only makes you stronger. You have to be willing to give and not just to take. That's stayed with me throughout my career and as a mother."

TEJADA (BACK ROW, FAR RIGHT) PICTURED WITH THE 1990–91 UNIVERSITY OF MICHIGAN WOMEN'S GOLF TEAM.

THINK DIFFERENT

With graduation looming, Tejada was prepared to go on to graduate school for healthcare administration, following in her father's footsteps. But it was her liberal arts experience coupled with wise words from her dad that encouraged her to dream big—and take a risk.

THE LIBERAL ARTS GIVES YOU THIS OPPORTUNITY TO EXPLORE DISCIPLINES AND SEE HOW THEY COME TOGETHER.

"I thought a broader experience would help me make a better decision about what I wanted to do with my life," she explains.

Tejada demurred, and after what she humbly calls a "long chain of happy accidents," she nabbed a job selling and managing brands at Procter & Gamble (P&G). The job was life-changing, reinforcing Tejada's belief in the power of leadership and mentoring and underscoring the importance of being accountable to oneself and one's customers. From P&G, Tejada went on to head companies in the tech, telecom, and hospitality industries before committing to the tech world, where she works today.

In 2016, Tejada became the CEO of PagerDuty, an incident resolution platform for websites, apps, and the technical infrastructure that enables them. You may not have heard of PagerDuty, but chances are that you browse websites, apps, and brands that use it. The service works like a hall monitor in the background of pages like Groupon or Eventbrite, pinging its engineers when there are unexpected disruptions or outages, leaving you—the user—to browse, blissfully unaware of any problems.

Tejada is excited to lead the company as it continues to expand, bringing the tools and values she gained as a liberal arts student to guide that growth.

"I benefited from a holistic education," says Tejada. "It served my intellectual curiosity, but also let me experiment. The liberal arts gives you this opportunity to explore disciplines and see how they come together. Having a sensibility for the arts, design, communications, and beyond helps me think differently than an engineer. For what I do, that's invaluable." ■

Taking the Lead

A program to bring scholars with a demonstrated commitment to diversity to LSA.

As part of its ongoing commitment to increasing diversity, equity, and inclusion (DEI) at the University of Michigan, the College of Literature, Science, and the Arts has undertaken a bold new program aimed at recruiting early career scholars to LSA with proven track records in DEI in their work as instructors, mentors, and researchers, and in their service.

The LSA Collegiate Postdoctoral Fellowship is a two-year fellowship, with consideration for a tenure track position upon the program's completion. Fellows get valuable time for focused scholarship and teaching experience, while engaging with the rich intellectual community at the University of Michigan.

This fall, the LSA Collegiate Postdoctoral Fellowship Program welcomes its first cohort of scholars.

Lia Corrales
Astronomy

Jennifer Jones
History

Nancy Khalil
American Culture

Margo Mahan
Sociology

Beza Merid
Communication Studies

Savithry Namboodiripad
Linguistics

Luis Zaman
Complex Systems

Congratulations and Welcome

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ONE GOOD DEED DESERVES ANOTHER.

LSA junior Salma Ali hopes to pursue a career in women's health. But it's not just about the job.

Even after her classes are over and her homework is done, Salma is still working. She spends her free time volunteering with organizations like Alternative Spring Break and Alpha Phi Omega.

"It's about making a difference," Salma says.

You can make a difference, too. Your gift to the LSA Fund for Scholarships means that students like Salma can worry less about money and more about their studies—and about how to make the world a better place.

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Coming from a Good Place

A small town in Japan and a neighborhood in Detroit face surprisingly similar problems — for completely different reasons. An innovative course from LSA's Center for Japanese Studies might have answers for them both.

IN 2011, the city of Ishinomaki made international headlines because it was devastated by tsunami waves and the Great East Japan Earthquake. The calamity destroyed more than 50,000 buildings and left behind more than six million tons of debris.

Three years later, when Brad Hammond (M.A. '15) first went to Ishinomaki, it reminded him of Detroit.

"Ishinomaki and Detroit are completely different places," he says, "but the problems of what to do about shrinking populations and industries were the same."

When he was hired as the engaged learning and Japan partnerships coordinator for the Center for Japanese Studies (CJS) in 2015, Hammond approached LSA's Center for Global and Intercultural Study (CGIS), LSA's Community-Engaged Academic Learning (CEAL) program, and Nick Tobier, a professor in the Stamps School of Art & Design and the Edward R. Ginsberg Senior Counsel to the Provost on Civic Engagement. Together with Associate Professor of History Leslie Pincus they created a course that would connect organizations in Ishinomaki and organizations in Detroit and collaborate on solutions to their common problems.

THE ISHINOMAKI STOOL, THE LAB'S FIRST PRODUCT, IS NOW PART OF THE PERMANENT COLLECTION AT THE VICTORIA AND ALBERT MUSEUM IN LONDON.

(THIS PAGE) Masaki Ogawa; (RIGHT) Center for Japanese Studies

THE LAB'S STUDIO WORKSHOP IS LOCATED IN THE HEART OF THE SEAFOOD PROCESSING DISTRICT.

"It was offered through CGIS as a global intercultural experience for undergraduates," Hammond says, "which requires a preparation course, an abroad experience, and some kind of application of the knowledge students gained abroad back here at home. We thought, what if we designate Ishinomaki as the study abroad site and Detroit as the application site back home?"

Ishinomaki is a provincial town in northern Japan flanked by the ocean on one side and rural countryside on the other. Before the tsunami hit, unemployment had driven people away in the 1980s, leaving a lot of vacant real estate. Afterwards, the damage was so complete no one talked about rebuilding. Instead, they talked about creating something new.

BEGIN BY DOING SOMETHING

Four months before the tsunami, Tokyo architect Keiji Ashizawa had finished renovating a friend's restaurant in Ishinomaki—one of the thousands of buildings the tsunami nearly destroyed. When Ashizawa returned to Ishinomaki, the obvious need was housing, and there was a dearth of people with either the training or tools to make necessary repairs. Ashizawa donated tools and started teaching people basic carpentry skills. A few months later, Ben Matsuzaki, president of furniture manufacturing company Herman Miller Japan, brought volunteers from his company and more tools and materials and held a furniture-making workshop with Ashizawa.

People were living in temporary housing, which came with clotheslines that were hard to reach. The tsunami had also swept away public benches, so even though the houses were cramped, there was nowhere to sit outside. Ashizawa designed a lightweight chair that doubled as a stepstool so people could hang their laundry and then sit for a chat with the neighbors.

The stool became the first product manufactured by Ishinomaki Laboratory, a global company that partners with internationally known designers to create a line of D.I.Y. furniture that serves a practical purpose. Its pitch to new designers goes something like this: *These are our materials and our tools. Here are our skills. Now go design something we can make.*

"Part of the Lab very much comes out of this trendy, hipster ethos appropriate to someone like Keiji Ashizawa," Hammond says, "but in the early aftermath of the tsunami they made things people needed to live their lives."

In just a few years, a town internationally known for its tragedy has also become known for its furniture, which is distributed and exhibited in museums and design shows all over the world. Today, Ishinomaki Laboratory's furniture line includes, among other things, desks, shelves, sofas, and shoe racks. It

also sells a quirky Bento D.I.Y. Kit, from which you can build a toolbox, a birdhouse, a bookshelf, or a stool.

The kit is a nod to those early, post-tsunami workshops Ashizawa offered, packaged to be reproduced in schools and in community workshops. The bento box embodies the Lab's D.I.Y. philosophy: Getting your hands on tools and making stuff is empowering.

Tobier and Hammond wondered if this philosophy would resonate in the Brightmoor neighborhood of Detroit.

STATE OF THE ART

For decades, Brightmoor has been known for crime and capacious blocks of abandoned buildings. As early as the 1990s, there were streets you could not drive down because there was too much garbage in the way: boats, junked cars, sofas, car tires. You could drive blocks without seeing an inhabited house, reasons why it also became known as Blight More.

By 2013, almost a quarter of Brightmoor's 8,000 houses stood empty. When the Detroit Blight Authority began working in the neighborhood, it pulled out 100,000 pounds of illegally dumped trash. Today, many of Brightmoor's vacant buildings have been razed. Crime is still a problem, but there are community gardens and signs of renewal. There is also a lot of art.

Since 2010, the Penny W. Stamps School of Art & Design has brought arts programming into Brightmoor by partnering with community groups and Detroit Community Schools. Joined by the Michigan Economic Development Corporation, Stamps launched a campaign in 2013 to convert a 3,200-square-foot vacant building into the Brightmoor Maker Space (BMS).

BMS, which opens this fall, will offer community workshops where adults and kids can develop creative skills and new business ideas can incubate. It's also the future production site of the Brightmoor Bento Box.

In March 2017, four U-M students; Tobier; Bart Eddy, lead instructor at BMS and co-founder of Detroit Community Schools; and Herman Miller senior engineer Mike Haag met with

KEIJI ASHIZAWA (ISHINOMAKI LAB FOUNDER/CEO) GIVES U-M STUDENTS FEEDBACK ON THEIR BRIGHTMOOR BENTO FURNITURE DESIGNS.

Center for Japanese Studies

30 Detroit Community High School students. They talked about Ishinomaki Laboratory and the spirit expressed through its products, particularly the Lab's Bento Box. The team introduced the idea of a Brightmoor Bento Box, and Tobier asked the high school students what such a box might contain.

The students had a lot of ideas, such as a *bender*, which transforms from a bench into a ladder, and a *pro chair*, which turns protest signs into chairs. Tobier drew some early schematics from the high school students' first designs and Tobier, Eddy, and the U-M students made a prototype with guidance from Ishinomaki Laboratory artisans when they arrived in Japan in May.

"All the time we were in Ishinomaki, students were reflecting back on the partners in Detroit," Tobier says. "They were also taking what they learned in Detroit to understand what was happening here."

HAVING SECOND (AND THIRD) THOUGHTS

The students presented the Brightmoor prototype kit and the furniture you can make from it to Keiji Ashizawa and Ben Matsuzaki. They then incorporated that feedback into a revised design. The Ishinomaki Lab staff led a workshop using their bento box to teach the students how to lead a workshop themselves. The students debuted the Brightmoor Bento Box when they led a workshop for the Ishinomaki Lab staff. In September, the U-M students and Keiji Ashizawa taught the Brightmoor high school students to lead a workshop with the Brightmoor Bento Box as part of a symposium celebrating CJS's 70th anniversary, U-M's Bicentennial, and the 2017 Detroit Design Festival, entitled *Building Community in Detroit and Regional Japan.*

In August 2017, the Brightmoor high school students, local wood artisans,

LSA JUNIOR PRINCESS FELIX (top left) AND KYRA HUDSON SAND COMPONENTS FOR THE PROTOTYPE BRIGHTMOOR BENTO KITS. THE INSTRUCTION BOOKLET WAS DESIGNED AND ILLUSTRATED BY FELIX.

(LEFT) LSA JUNIOR SAKILA ISLAM (front) AND LSA SOPHOMORE RHEA MORGAN (back) HELP RUN AN "IDEATHON" WITH ITNAV.

(RIGHT) A PERSONALIZED MAP OF ISHINOMAKI.

and U-M students began producing the Brightmoor Bento Box. Using the Lab's sales and distribution model, they hope to associate Brightmoor more with these beautifully crafted bento boxes and less with blight.

Facilitating the collaboration between Ishinomaki and Detroit has had a huge impact on the students. "Some of our students had never left the country or been on a plane," Tobier says. "For them to go somewhere so far away and to connect with people there in such a powerful way was an astounding thing to witness. As we watched, they achieved a degree of confidence and an understanding that their role in the world is just emerging."

Hammond recalls a night a few students from Detroit were talking with each other about replicating what they'd seen in Ishinomaki back home. In Ishinomaki, Makigumi had renovated a space called "The Geek Factory" for ITNAV (see sidebar). Ishinomaki Lab had furnished it. They brought their collected strength to bear on their community's issues. The students saw potential in bringing interdependent groups together to support neighborhoods in Detroit.

This, from the beginning, was the power Hammond saw in the program. Connecting students to people as well as to a place in Japan gave them a chance to think about problems from a different perspective, and to become immersed in the issues and aspirations of a particular place. It gives them a new lens to look at themselves and problems closer to home, too. "By asking them to work at the grassroots level," Hammond says, "we hope to create an experience that enriches and complicates their world." ■

Makigumi and Revival Detroit address long-standing real estate vacancies in their respective communities. The U-M students studied the strategies each used for acquiring and renovating vacant property and for engaging the community around them in order to create a toolkit of best practices.

ITNAV and Detroit Hispanic Development Corporation create opportunities for high school students. The U-M students helped to create Humans of New York-like profiles of students from both cities who were interested and active in STEAM, creating a forum where students can compare their stories and experiences.

Ishinomaki Laboratory and Brightmoor Maker Space cultivate local economic development by teaching people creative skills and incubating new business ideas. Inspired by Ishinomaki's Bento D.I.Y. Kit, these groups worked together to design a kit manufactured and sold in Detroit.

READ MORE ONLINE

(THIS PAGE, left) Tiantian Zhang; (THIS PAGE, right) Center for Japanese Studies; (RIGHT) Liz DeCamp

In Our Language

One LSA professor's work to help kids who speak Spanish keep the language alive.

SINCE 2010, THE En Nuestra Lengua program has offered Saturday classes for bilingual children in Ann Arbor. En Nuestra Lengua, which means "in our language," runs all of the classes in Spanish to help children raised in Spanish-speaking homes remain bilingual and become biliterate. The program was founded by Department of Romance Languages and Literatures Associate Professor Teresa Satterfield.

Bilingualism and biliteracy have all kinds of positive effects, Satterfield's research finds. One consequence is an increased efficiency in how the brain processes language. And retaining a language spoken at home prior to school-age years means that, as students get older, they have better outcomes in learning a second language than they would have had if they had simply abandoned the first. But there is a more personal outcome for many students, Satterfield says, and that's the ability to connect daily with one's family, to discuss the details of one's day, one's classes, one's friends and anxieties.

LSA: Can you describe the En Nuestra Lengua program in your own words?

TS: It's my passion. En Nuestra Lengua is both a community program for outreach and also a program that we're gaining a lot of data from. There is not a lot of research that's being done on kids in the United States who are perfectly bilingual and biliterate. In the United States, what typically happens is kids who come from a home where they're speaking a language other than English are cut off from that language at kindergarten when they start school. They don't have an easy way to continue developing in their home language in terms of literacy, which means that they lose some crucial parts of development and typically don't recover.

We now know that for kids who don't get to continue with literacy in their first language, that cutoff actually stunts their growth in the second language as well. So if we want these kids to be functional in English, then we are actually doing them a disservice. Because they haven't continued their home language, then they really don't have the building blocks, or hooks, to latch onto concepts from English. So they have to start from scratch. And so we see, by fourth grade, these terrible literacy statistics for Latinos, and by high school the highest dropout rate of any other group in our country.

LSA: What were some of the challenges of starting a program like this?

TS: When we decided to start a program like this, we investigated lots of other U.S. "Saturday" schools: Hebrew schools and Chinese schools and German schools and Arabic schools. There are all these different ethnic communities that have schools precisely to carry on language and culture and literacy, and those kids seem to do well academically. They do well in English. They're grounded. They have more of an identity. And we know from research that if you have a strong cultural identity, then you seem to have greater academic success. So we were thinking, well, what happens in the Latino community? Why aren't we seeing these kinds of Saturday schools there?

So we decided to do this American flavor, hands-on educational program where the kids are the central focus. We go in parallel with the Ann Arbor Public Schools curriculum, and so the kids are getting the same content that they are getting during the week in English, but on Saturdays we do it in Spanish. And because we do it that way, now the parents know what the kids are doing in the regular school, and the kids are getting this reinforcement from what they're doing in the daily school, and then they can talk to their parents about it in Spanish. So it's win-win.

RETAINING A LANGUAGE SPOKEN AT HOME BEFORE SCHOOL-AGE YEARS MEANS THAT STUDENTS HAVE BETTER OUTCOMES IN LEARNING A SECOND LANGUAGE THAN THEY WOULD IF THEY HAD SIMPLY ABANDONED THE FIRST.

LSA: It sounds like the program requires pretty close collaboration with parents and community partners.

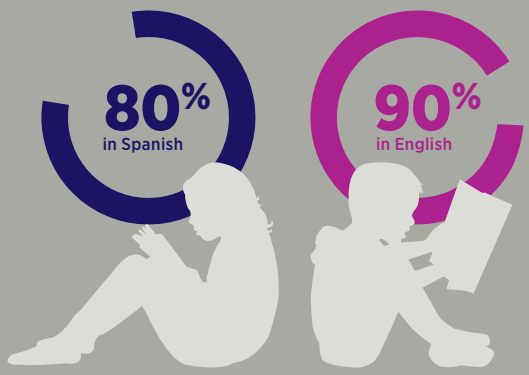
TS: We definitely touch base with the teachers that the children in our program are involved with. We also do workshops in the Ann Arbor schools so that teachers and administrators who are experiencing the demographic shift firsthand can better support Latino families in the school.

It's a new situation for everyone. Many Latino parents, more and more of whom are immigrants and refugees, are intimidated by the American educational system. Parent-teacher conferences don't happen in Latin America. There, the teacher is the authority. You don't question it.

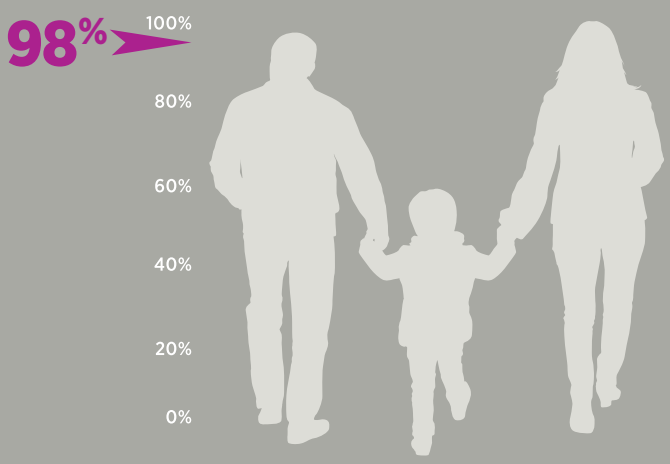
In En Nuestra Lengua, parents are present in the classroom. They do presentations and participate in parent-teacher conferences. And we see that once the parents do all of this in Spanish, then they are a lot more apt to go into their child's other classrooms and become more proactive. They participate more. And it's so huge for a child to see their parent in their school, being active in their child's education—these little things are so important for a child's self-esteem and their identity.

Courtesy of Teresa Satterfield

STUDENTS READING AT GRADE LEVEL OR BETTER

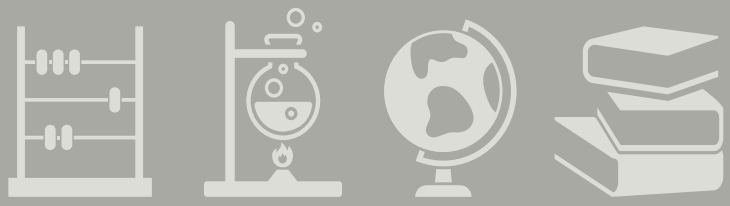


PARENT PARTICIPATION IN EN NUESTRA LENGUA



MULTI-GRADE UNITS AND PROGRAMS

- Mathematics and science units
- Project World pre-kindergarten program with home literacy activities
- Reading groups for middle schoolers



LSA: Do you have a favorite activity or lesson?

TS: So the main thing we try to do is make Saturdays fun. It's Saturday, right? It's school, but it's *Saturday*.

So we usually start with a kind of hot potato game where there's music playing with Spanish lyrics and there's some kind of ball going around and the music stops. And the child with the ball is not out. As a matter of fact, they want to get the ball because then they get to ask a question or say something about their week or rave about their favorite color in Spanish. Younger kids, they love all of that, but we do the same thing with the older kids. We usually put stickers on the ball, and each sticker has an interesting question in Spanish or it has the name of a classmate and they have to think of something good to say about that person.

The kids love the game, and I love seeing the kids laughing to start school. I know they don't necessarily get to start their regular school day like that. I love walking through each of our ten classrooms and seeing the sense of belonging these kids feel and hearing all the kids laughing, starting well, speaking Spanish. It's great. ■

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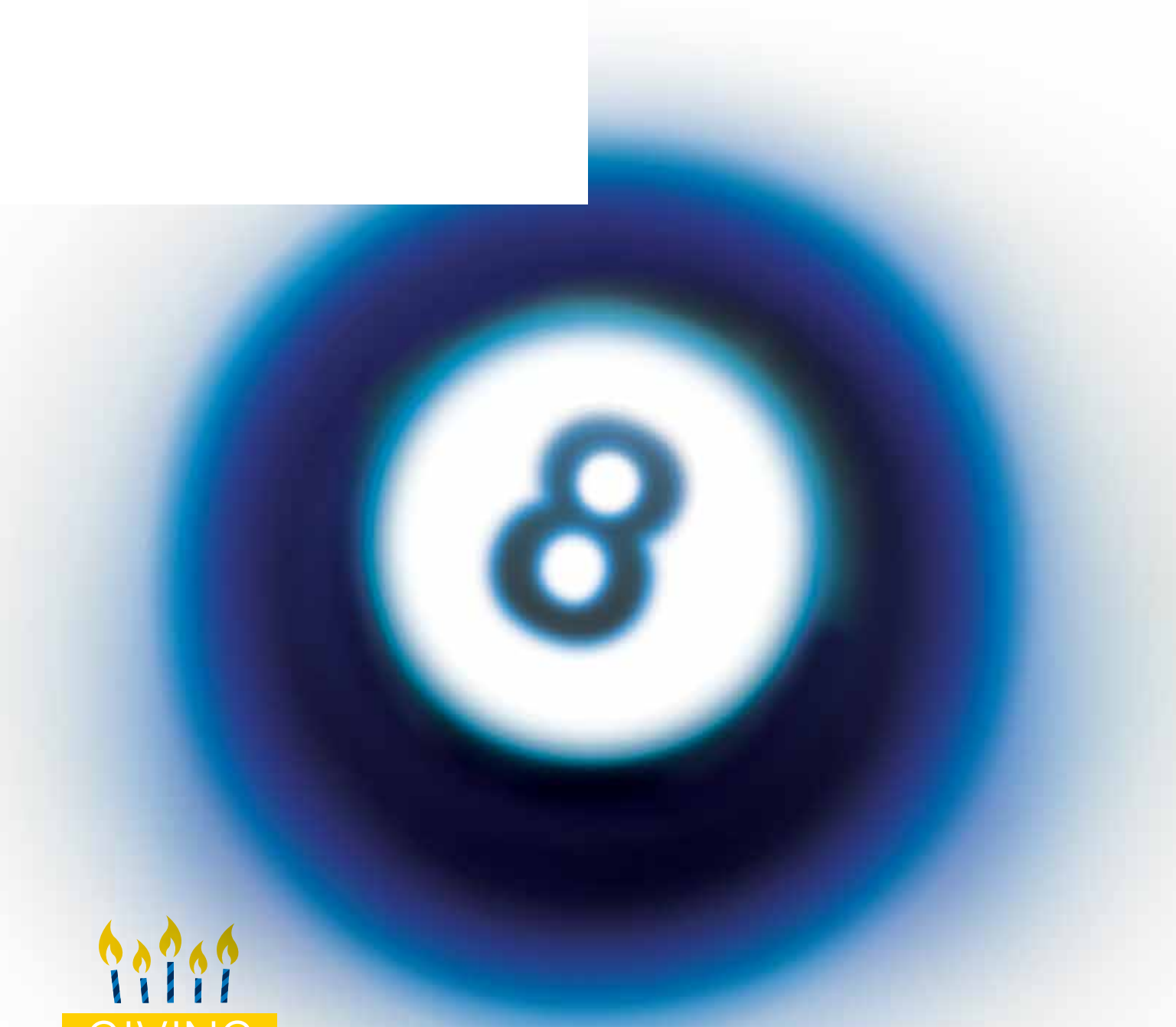

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