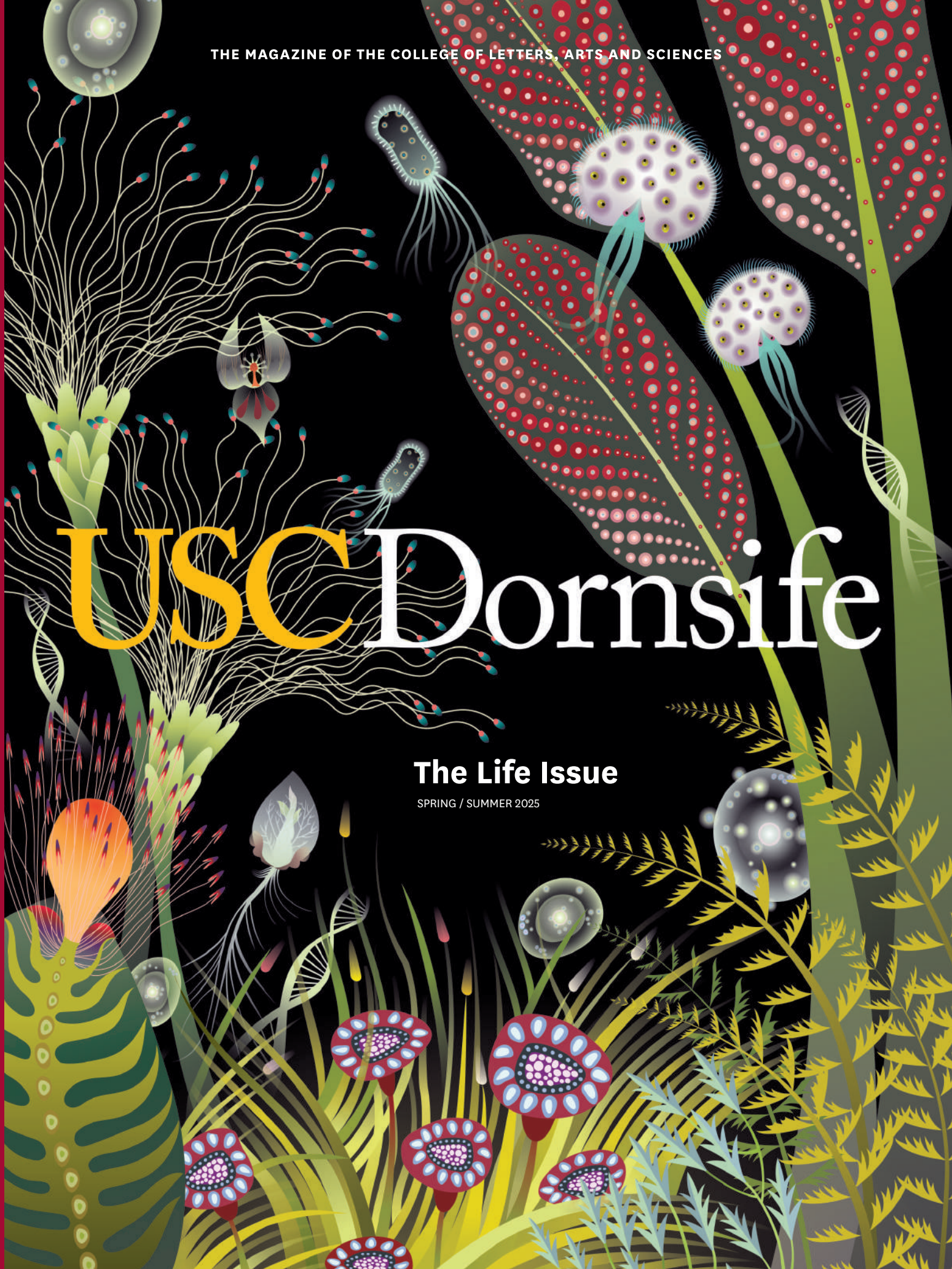
THE MAGAZINE OF THE COLLEGE OF LETTERS, ARTS AND SCIENCES

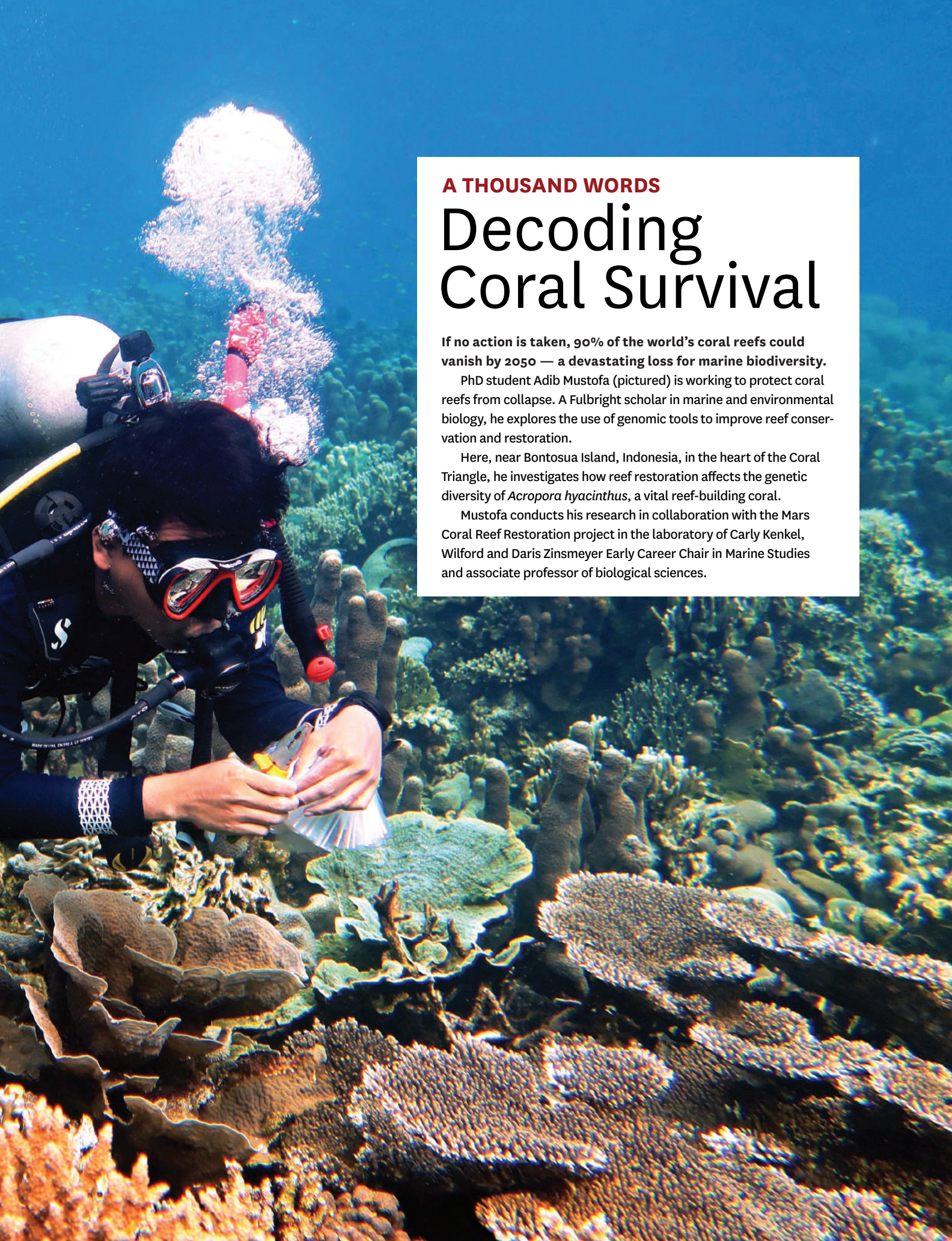


USC Dornsife

The Life Issue

SPRING / SUMMER 2025





A THOUSAND WORDS

Decoding Coral Survival

If no action is taken, 90% of the world's coral reefs could vanish by 2050 — a devastating loss for marine biodiversity.

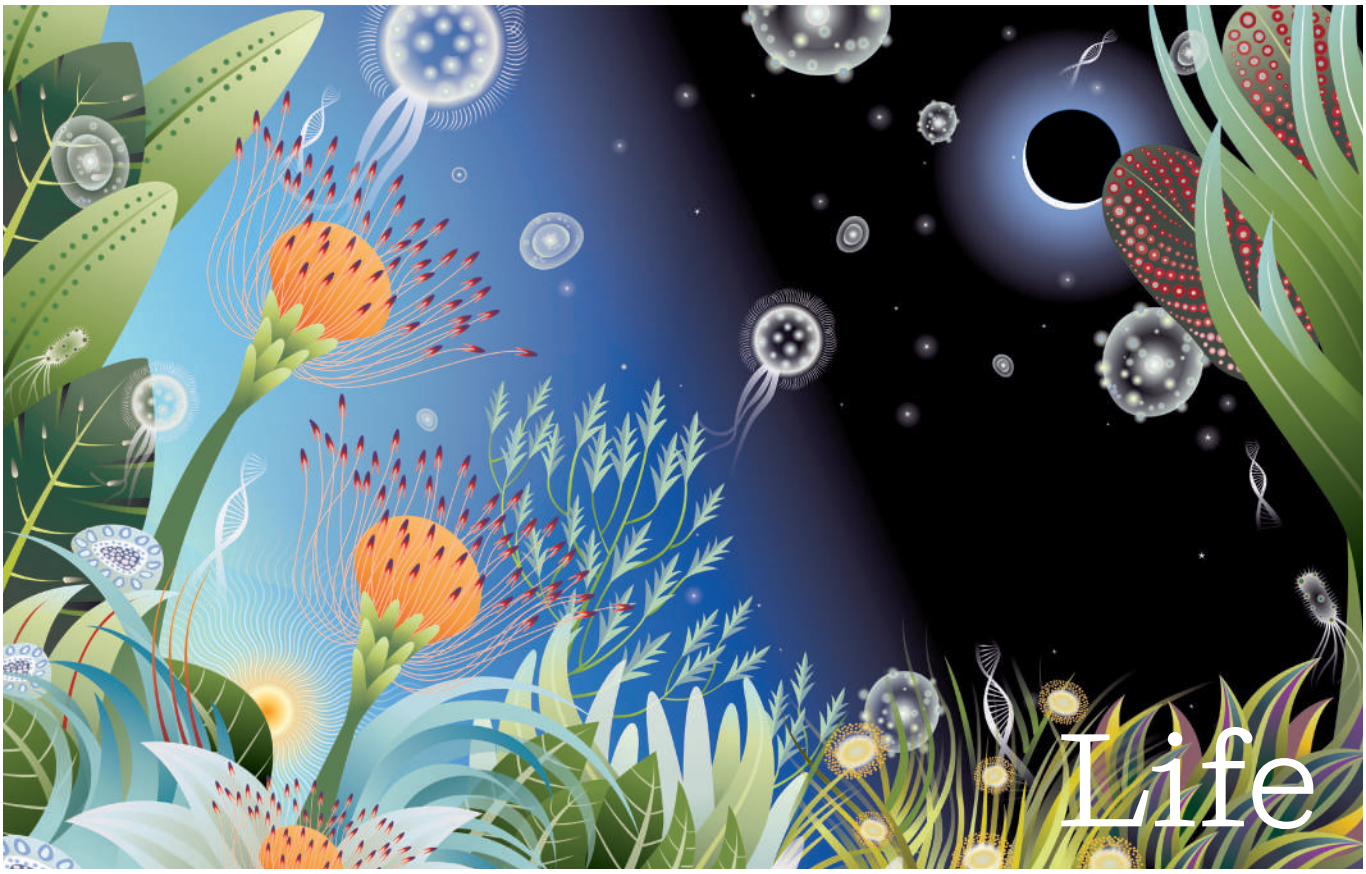
PhD student Adib Mustofa (pictured) is working to protect coral reefs from collapse. A Fulbright scholar in marine and environmental biology, he explores the use of genomic tools to improve reef conservation and restoration.

Here, near Bontosua Island, Indonesia, in the heart of the Coral Triangle, he investigates how reef restoration affects the genetic diversity of *Acropora hyacinthus*, a vital reef-building coral.

Mustofa conducts his research in collaboration with the Mars Coral Reef Restoration project in the laboratory of Carly Kenkel, Wilford and Daris Zinsmeyer Early Career Chair in Marine Studies and associate professor of biological sciences.

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SPRING / SUMMER 2025



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Philosophers tackle life's biggest question — and offer some surprising answers.
BY TOMAS WEBER

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"These deep-life microbes are alive and have decidedly weird lifestyles — doing strange, fascinating things we're only just beginning to understand."

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The deep Earth is teeming with secret life we never imagined existed.
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Professor Josh West has made numerous research trips to the Amazon — often with students in tow — to understand the rainforest's ecosystem and support sustainable land use.

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"My career hasn't been linear, and I've never had a plan. Don't be afraid to do the same because reflecting on the path you took will help inform your future."

KATE MCCUTCHEN '04

SUCCESSFUL INTERNATIONAL BUSINESSWOMAN WORKIN A-LIST COMPANIES WHILI IN EUROPE AND THE UNITED KI

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PHOTOS: MUSUK NOLTE / COURTESY OF NATIONAL GEOGRAPHIC SOCIETY; KATY ECKERMAN; KATIE GARNER

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THE MYSTERY THAT DRIVES US

Life, in all its forms, has fascinated us from the beginning. We ponder it, measure it, even try to replicate it. Yet, for all our efforts, much of life remains a mystery. Our relentless curiosity has driven inquiry across centuries — not to pin life down, but to follow where it leads.

At USC Dornsife, this pursuit takes us everywhere.

It takes us to extreme environments that reveal life's resilience in places once thought uninhabitable. Our natural scientists, for example, explore the depths of the ocean, where they've discovered microbes thriving in deep-sea hydrothermal vents. Others search for life beyond our planet; USC Dornsife astrobiologists helped develop technology on NASA's Perseverance rover to detect signatures of ancient microbial life on Mars.



"Life is about more than biology; it's about opportunity, circumstance, and the institutions we build around it."

It takes us to new ways of thinking about the structures that affect how we as a society live together. Our economists and political scientists study the "rules of the game," which can determine, by our own creation, who gets to flourish and who is left fighting to survive. Their research reminds us that life is about more than biology; it's about opportunity, circumstance and the institutions we build around it.

And this pursuit provides fresh perspective on the human experience. Our historians, for example, explore patterns in human behavior — from conflict and cooperation to innovation and decline. Similarly, our creative writers delve into the complex narratives that influence how we think about identity and culture as well as the stories that shape lives long after we are gone.

No matter the approach, USC Dornsife experts are driven by the mystery of it all. What is life? Where does it begin? How does it persist? And, most importantly, how do we make the most of it while we're here? We may never find all the answers — but that's the point. It is the not knowing that keeps us searching, reflecting and imagining what is possible.

Well, that, and the eternal debate over where to find the best tacos in L.A.

MOH EL-NAGGAR
INTERIM DEAN

PHOTO: OLGA BURYMSKA

RESEARCH PULSE

Science, Justice and Civic Life

URBAN TREES WORKING OVERTIME

Trees in central Los Angeles are far more effective at offsetting fossil fuel emissions than expected — especially during summer. That's the finding of a Public Exchange study led by Will Berelson, Paxson H. Offield Professor in Coastal and Marine Systems and professor of Earth sciences, environmental studies and spatial sciences.

Using 12 strategically placed carbon sensors, researchers tracked CO_2 emission and absorption in real time across a 15-by-6-mile section of L.A.'s Mid-City. They found that local vegetation absorbed up to 60% of daytime fossil fuel CO_2 emissions in spring and summer — placing L.A. among the top cities for urban carbon uptake.

"Nature is helping us," Berelson says, "but we can't rely on it to do all the work." Annually, urban greenery absorbs only about 30% of fossil fuel emissions in the study area, underscoring the urgent need for clean energy, improved public transit and broader emissions reductions.

THE CASE AGAINST 'PAY-TO-STAY'

Charging incarcerated individuals for room and board — a controversial practice known as "pay-to-stay" — remains legal in most states. In a new study, Brittany Friedman, assistant professor of sociology, explores how Illinois became one of the first states to repeal its law and what lessons that holds for national reform.

Analyzing decades of legislative records and lawsuits, Friedman and her team found that Illinois lawmakers repealed the law after concluding it failed to generate revenue and disproportionately harmed low-income families. The state's legal costs often exceeded the amount collected, and nearly 80% of those sued were still incarcerated, making repayment nearly impossible.

"Illinois proves that meaningful reform is possible when both parties come together," says Friedman, co-founder of the Captive Money Lab. Fiscal arguments — more than moral appeals — were key to winning bipartisan support, offering a potential roadmap for other states considering similar reforms.

ELEVATING CIVICS EDUCATION

What if young Americans could learn how to productively discuss contemporary and contested issues? That's the timely goal of an innovative new program in some middle and high schools. It's designed to prepare teachers of eighth- to 12th-grade students to foster skills in productive discussion and deliberation.

USC Dornsife's Center for Applied Research in Education (CARE) is evaluating the program's effectiveness, supported by a $4 million grant from the U.S. Department of Education.

"Now more than ever, schools need to be places where students can productively and respectfully discuss multiple perspectives on potentially contested topics," says CARE co-director Anna Saavedra. "We aim to provide valuable insights regarding this program, including how to prepare young people for the rights and responsibilities of U.S. citizenship."

3 THINGS TO KNOW

Brain and Creativity Institute

1 **Unlocking the Mind** Institute researchers explore fundamental questions about how we think, feel and create. Their work sheds light on emotions, decision-making and the deep connections between the brain and human consciousness.

2 **Shaping the Future** Through hands-on research, students work alongside leading scientists to investigate everything from music's impact on brain development to the roots of empathy and morality. Their discoveries have real-world applications in education, mental health and artificial intelligence.

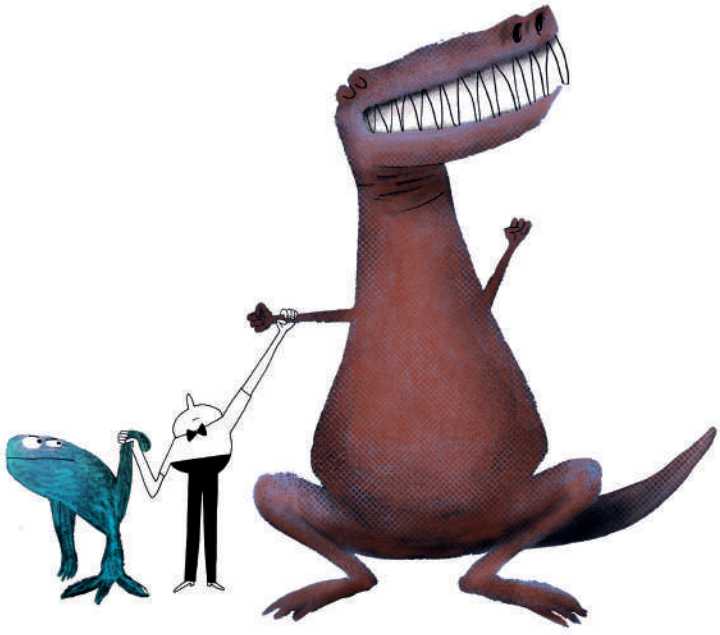
3 **Place Like No Other** Housed in a one-of-a-kind space that includes advanced brain imaging labs and an intimate, state-of-the-art performance hall, the institute bridges science and the humanities. Here, research and creativity come together to reveal new insights into what makes us human.

"We bring science and the humanities together to uncover how the brain shapes our thinking, our feelings and emotions, and our social behavior."

UNIVERSITY PROFESSOR
ANTONIO DAMASIO
DIRECTOR
USC BRAIN AND CREATIVITY INSTITUTE

newsround

USC DORNSIFE SCHOLARS IN THE MEDIA



"There are winners and losers in every mass extinction."

VICTORIA PETRYSHYN (ENVIRONMENTAL STUDIES) TO ***SMITHSONIAN MAGAZINE*** FOR A STORY ABOUT THE MASS EXTINCTION THAT EVENTUALLY LED TO THE RISE OF DINOSAURS.

"THESE ARE THE VERY LAST PICTURES TAKEN OF HOLOCAUST VICTIMS BEFORE THEY WERE DEPORTED AND PERISHED."

WOLF GRUNER (CENTER FOR ADVANCED GENOCIDE RESEARCH, HISTORY) TO **YAHOO NEWS** REGARDING NEWLY DISCOVERED PHOTOS OF NAZI MASS DEPORTATIONS THAT HE AND COLLEAGUES ARE ANALYZING.

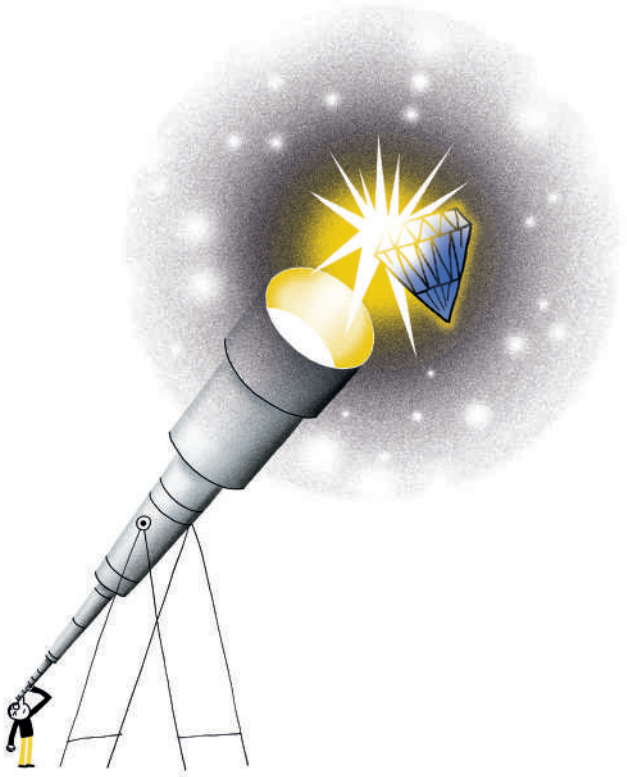
"The biggest hope is that our work can improve LAPD officer training."

MORTEZA DEHGHANI (PSYCHOLOGY) TO ***SCIENTIFIC AMERICAN*** ON HIS STUDY USING AI ANALYSIS OF BODY CAMERA FOOTAGE TO EXAMINE HOW POLICE OFFICERS TREAT DRIVERS DURING TRAFFIC STOPS.

"NATURE DELIVERS THE INITIAL BLOW, BUT A COMPLEX INTERPLAY OF HUMAN, ORGANIZATIONAL AND TECHNOLOGICAL FACTORS CAN EITHER MITIGATE OR WORSEN THE CONSEQUENCES."

NAJMEDIN MESHKATI (INTERNATIONAL RELATIONS) TO **THE CONVERSATION** REGARDING NATURAL DISASTERS, IN THE WAKE OF THE JANUARY WILDFIRES IN LOS ANGELES.

ILLUSTRATIONS: KLAAS VERPLANCKE



"White dwarves are a hundred thousand times denser than diamond."

VAHÉ PEROOMIAN (PHYSICS AND ASTRONOMY) IN A **PBS** NEWS STORY DESCRIBING HOW NOVA EVENTS WORK.

"BEHIND EVERY SOFTWARE ENGINEER OR ENTERTAINMENT INDUSTRY LAWYER IS AN ARMY OF NANNIES AND FOOD SERVICES WORKERS AND GARDENERS."

MANUEL PASTOR (EQUITY RESEARCH INSTITUTE, SOCIOLOGY, AMERICAN STUDIES AND ETHNICITY) TO THE ***LOS ANGELES TIMES*** ON HOW IMMIGRANT DEPORTATIONS DISRUPT THE ECONOMY AND WORKFORCE.



"I've written about climate refugees and that this is going to happen. And now I'm one of them."

GALE SINATRA (PSYCHOLOGY) TO **BLOOMBERG NEWS** REGARDING L.A.'S JANUARY WILDFIRES, WHICH DESTROYED HER HOME.



IN THE FIELD

Preserving the Amazon

THE PROFESSOR HELPING REVIVE THE REGION'S VITAL LANDS.

BY DANIEL P. SMITH

The Amazon rainforest is often described as the planet's "heart and lungs" — and for good reason. Its rich biodiversity sustains life around the globe, from regulating the climate to providing lifesaving pharmaceuticals.

Josh West, professor of Earth sciences and environmental studies, has devoted his career to driving sustainability in this region. His current research focuses on the impact of artisanal gold mining — a term that sounds innocuous but often masks a devastating practice.

In their avid hunt for gold, thousands of small-scale mining operations cut deep gashes into the Amazon, leaving behind oversized piles of barren sand and stagnant ponds. Churning up the land threatens the region's biodiversity, pollutes rivers with toxic mercury and releases potent greenhouse gases into the atmosphere.

"It's like burning down the house and tearing up the foundation," West says.

Using high-tech mapping and remote sensors, West and his team are pinpointing the areas hardest hit by mining and identifying where restoration efforts can have the biggest impact. Their goal: to turn scarred land back into thriving rainforest.

It's not easy. Commercial interests and transnational political barriers often stand in the way. But West remains steadfast in his determination to help protect the Amazon — and to inspire others to do the same.

"Losing the rainforest would be a devastating loss for humanity," he says. "The Amazon sustains life far beyond its borders."



A RIVER-SPANNING MISSION

Josh West, professor of Earth sciences and environmental studies, is currently participating in the National Geographic and Rolex Perpetual Planet Amazon Expedition, an extensive science and storytelling journey spanning the entire Amazon River Basin, from the Andes to the Atlantic.

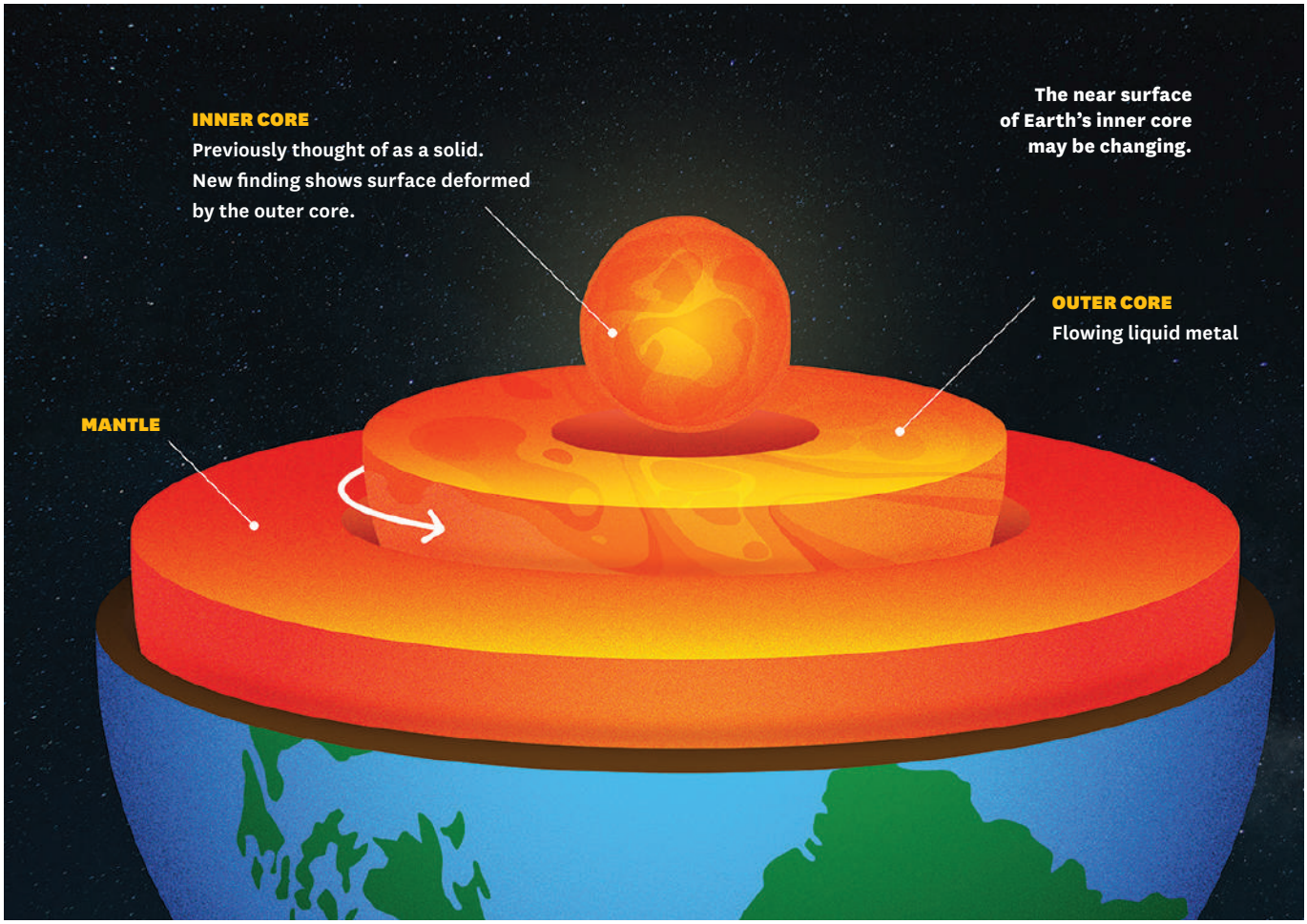
WHERE THEY GO

The aerial view (left) of Peru's Madre de Dios region shows where West and his team are exploring the environmental legacy of artisanal gold mining and its associated mercury pollution. Their goal? To understand the impact on water quality and to develop innovative, scalable solutions.

Learn more — watch the NatGeo video here.

PHOTOGRAPHY: MUSUK NOLTE / COURTESY OF NATIONAL GEOGRAPHIC SOCIETY

ON THE RECORD



Core Discovery

EARTH'S INNER CORE MAY BE LESS SOLID THAN ONCE BELIEVED, A NEW USC DORNSIFE STUDY FINDS.

Long a topic of scientific debate, questions about Earth's inner core have mostly focused on its rotation. But surprising new research from USC Dornsife scientists has detected unexpected structural changes near the planet's center, altering the way we look at Earth's dynamics.

"We didn't set out to define the physical nature of the inner core — our original goal was to study its slowing rotation," says John Vidale, Dean's Professor of Earth Sciences and lead author of the study published in the scientific journal *Nature Geoscience*. "However, what we ended up discovering is evidence that the near surface of Earth's inner core undergoes structural change."

The inner core, 3,000 miles beneath Earth's surface, was thought to be a solid sphere anchored by gravity in the molten outer core. "But as I was analyzing multiple decades' worth of seismograms, one dataset of seismic waves curiously stood out," Vidale says. "Later, I realized I was staring at evidence the inner core is not solid."

Using data from 121 repeating earthquakes near the South Sandwich Islands from 1991–2024, researchers observed anomalous waveforms at a station in Yellowknife, Canada. "At first the dataset confounded me," Vidale says. Improved resolution revealed these waveforms represented unexpected physical activity.

The findings suggest the inner core's surface may undergo viscous deformation, shifting shape due to interaction with the turbulent outer core. "What we're observing in this study for the first time is likely the outer core disturbing the inner core," Vidale says, noting that this discovery could lead to deeper insights into Earth's thermal and magnetic dynamics. —*W.K.*

IMAGE: USC GRAPHIC/EDWARD SOTELO

OBJECT

Prehistoric Campus Predator

MEET *SMILODON FATALIS*, ONCE ONE OF SOUTHERN CALIFORNIA'S MOST FEARSOME FELINES.

BY MARGARET CRABLE



"During their lifetimes, these powerful predators undoubtedly wandered what is now the USC campus."

EMILY LINDSEY, ASSOCIATE CURATOR AND EXCAVATION SITE DIRECTOR AT LA BREA TAR PITS AND MUSEUM, AND ADJUNCT ASSISTANT PROFESSOR (RESEARCH) OF EARTH SCIENCES

Some 15,000 years ago, *Smilodon fatalis* — one of North America's last species of prehistoric saber-toothed cats — prowled the area we now call Los Angeles.

This apex predator inhabited the Americas for more than a million years, hunting large herbivores such as camels and giant ground sloths. Massive forelimbs and curved fangs measuring up to 10 inches long enabled it to pin down prey and slice through flesh with the precision of a steak knife.

Starting around 14,700 years ago, scientists believe a changing climate and the arrival of humans began to impact *Smilodon*'s habitat and main food sources. In Southern California, these intersecting pressures culminated in a massive outbreak of wildfires that coincided with the extinction of dozens of species of large, ice age mammals.

Today, *Smilodon*'s legacy is preserved in the sticky asphalt of L.A.'s La Brea Tar Pits, just a few miles from USC. A *Smilodon* was the first confirmed fossil find in the late 1800s, establishing the pits as an important scientific site. Researchers have since uncovered remains from some 2,000 *Smilodon* individuals, including a giant canine tooth (pictured) from one of the last saber-toothed cats that died in the pits around 13,000 years ago.

These remains also revealed something unexpected: *Smilodon* may have lived in social groups — an unusual trait for big cats.

"This theory is supported by the large numbers of *Smilodon* found at our site, as well as the survival of numerous animals with evidence of disease or injury, suggesting a care structure," says Emily Lindsey, associate curator and excavation site director at La Brea Tar Pits and Museum, and adjunct assistant professor (research) of Earth sciences at USC Dornsife.



PHOTO: NATURAL HISTORY MUSEUMS OF LOS ANGELES COUNTY; IMAGE: COURTESY OF LA BREA TAR PITS / LAURA TEWKSBURY

TAKE SIX

Life in Six Acts

FROM OUR FIRST CRY TO OUR FINAL BREATH, EACH PHASE OF LIFE BRINGS NEW VERSIONS OF OURSELVES, WITH FRESH CHANGES AND CHALLENGES.

BY MARGARET CRABLE



2 CHILDHOOD

Between ages 3 and 6, self-regulation takes shape, and this coincides with the important development of children's ability to understand others' thoughts and feelings, says Morales.

1 INFANCY

In its first year, a baby's brain doubles in size. By the end of infancy, it has reached 80% of the size of the adult brain. "Change is probably the single best word to describe infancy," says Santiago Morales, assistant professor of psychology and pediatrics.





3 ADOLESCENCE

Adolescence as distinct from adulthood is a relatively modern concept. "The United States mandated high school attendance in 1918, cementing the teen years as a cultural category that would blossom during the 20th century," says Professor Emeritus of Sociology Michael Messner.

ILLUSTRATIONS: ANDREA MONGIA



4 **YOUNG ADULT**

After high school, life's dress rehearsal concludes. College, careers and longer-term relationships — often romantic — begin. "In young adulthood, we start to find our place in the world," says Professor Emerita of Psychology and Pediatrics Gayla Margolin.



5 **MIDDLE AGE**

"This is a stage of increased responsibilities at home and at work — along with a fair share of economic stress," says Margaret Gatz, professor of psychology. But there's good news: Research shows that around age 50, self-reported happiness tends to rise.



6 **OLD AGE**

With age comes wisdom — and a chance to share it. "Mentoring increases our sense of purpose in life, and that's associated with decreased cognitive decline and dementia risk," says Duke Han, professor of psychology and family medicine.

"Characterizing life as a series of stages offers a way to describe how psychological demands and opportunities evolve over the lifespan — from how we manage relationships with others to how we gain in resilience and wisdom."

MARGARET GATZ, PROFESSOR OF PSYCHOLOGY

SNAPSHOT

Gut Instinct

BY TOMAS WEBER

Early in his career, biological scientist Steven Finkel taught students how to destroy what he now spends his days trying to understand.

In the 1990s, during a postdoc at Harvard Medical School, future doctors were taught how the body works — from the circulatory system to the kidneys and the liver. But when it came to microbes, the message was simple: Destroy them. "The primary interest was to teach students how to kill them," says Finkel, "because medicine considered them only as disease organisms."

Today, thanks in part to Finkel's research into how microbes survive and thrive in environments including the gut, the scientific perspective has radically changed. We now recognize that the teeming worlds inside our bodies — simultaneously alien and intimately close — are crucial to our health and well-being.

"Everyone's digestive system has a unique resident community of hundreds of bacterial species," says Finkel, professor of biological sciences and college dean of graduate and professional education. These trillions of microbes may influence everything from our weight to our mood. They not only provide essential vitamins and help train the immune system — some may even provide certain neurotransmitters like dopamine and serotonin, potentially influencing how we feel.

UNDERSTANDING THE GUT MICROBIOME

Finkel suggests the gut microbiome may wield even more power over us than we realize. "Our bodies are curating our microbiome," he says. "But our microbiome might also be curating us, by making us do certain things." For example, there is evidence that some bacteria in the gut can contribute to cravings for foods that are high in fat and sugar.

As well as helping to shape our dietary preferences, the gut microbiome, when unbalanced, can make us ill. An unhealthy microbiome can trigger or exacerbate conditions such as irritable bowel syndrome, diabetes and cardiovascular disease. Yet, researchers still don't fully understand how this microbial universe operates. "Everyone's gut is their own universe," says Finkel, "and we are far from having a complete understanding of how bacteria in the gut interact with each other, and how they interact with each human host."

Finkel's lab is working to uncover how microbial communities function — and sometimes fail. He and his team analyze stool samples, cultivate bacteria and study how microbes breathe, eat, grow and die. One of their more surprising discoveries: Gut microbes produce electricity. Bacteria might even communicate using electrical signals. These communication networks may be essential to microbiome health — and when disrupted, Finkel suggests, the resulting "power outages" might contribute to disease.

"We knew that electricity-producing microbes exist in natural environments and even in some sewage treatment plants," he says. "But no one had previously connected the dots and realized this phenomenon might also be occurring in the human gut."

Understanding how gut microbiomes function could someday allow scientists to shape them for our benefit. Although the booming probiotic supplement industry promises such benefits, Finkel notes that, at present, more research will be required to make the supplements reliable. We still don't know enough, he says, to assess the state of someone's gut microbiome — let alone tailor individualized treatments.

Improving our understanding of the gut microbiome's composition and activity could one day make personalized treatments possible. "I wouldn't be surprised if in five to 10 years," says Finkel, "diagnostics will enable us to assess the state of the gut microbiome and possibly correlate it with a particular disease or health outcome."



PHOTOGRAPHY: MISHA GRAVENOR

Recently elected a Fellow of the American Association for the Advancement of Science, biological scientist Steven Finkel is exploring the teeming ecosystem inside our gut microbiome.



The Life Within

Molecular biology PhD student Nicolaus Jakowec '20 is fascinated by microbes. After focusing on virology as an undergraduate, he is now working alongside biological scientist Steven Finkel to uncover microbes' fundamental metabolic processes — and is already making important breakthroughs.

What aspect of microbes do you focus on?
I study the metabolism and resilience of bacteria — how they store energy and carbon to survive during periods of stress, including starvation. I'm also trying to understand why they might choose to burn excess calories.

How does this work relate to the gut microbiome?
There's an assumption that microbes in the gut are never starving as long as we're eating regularly. But in fact, there is a lot of competition between bacteria for nutrients, even in the gut. I'm interested in how cells rewire their pathways in response to these moments of stress. It's basic science, but understanding these metabolic pathways could have relevance for all sorts of conditions potentially linked to a disrupted gut microbiome.

What do you find most fascinating about your research?
It's amazing to try to recreate an environment like the gut in the lab. We're asking fundamental questions and drawing on a lot of interdisciplinary methods, tools and technologies to answer them. —*T.W.*

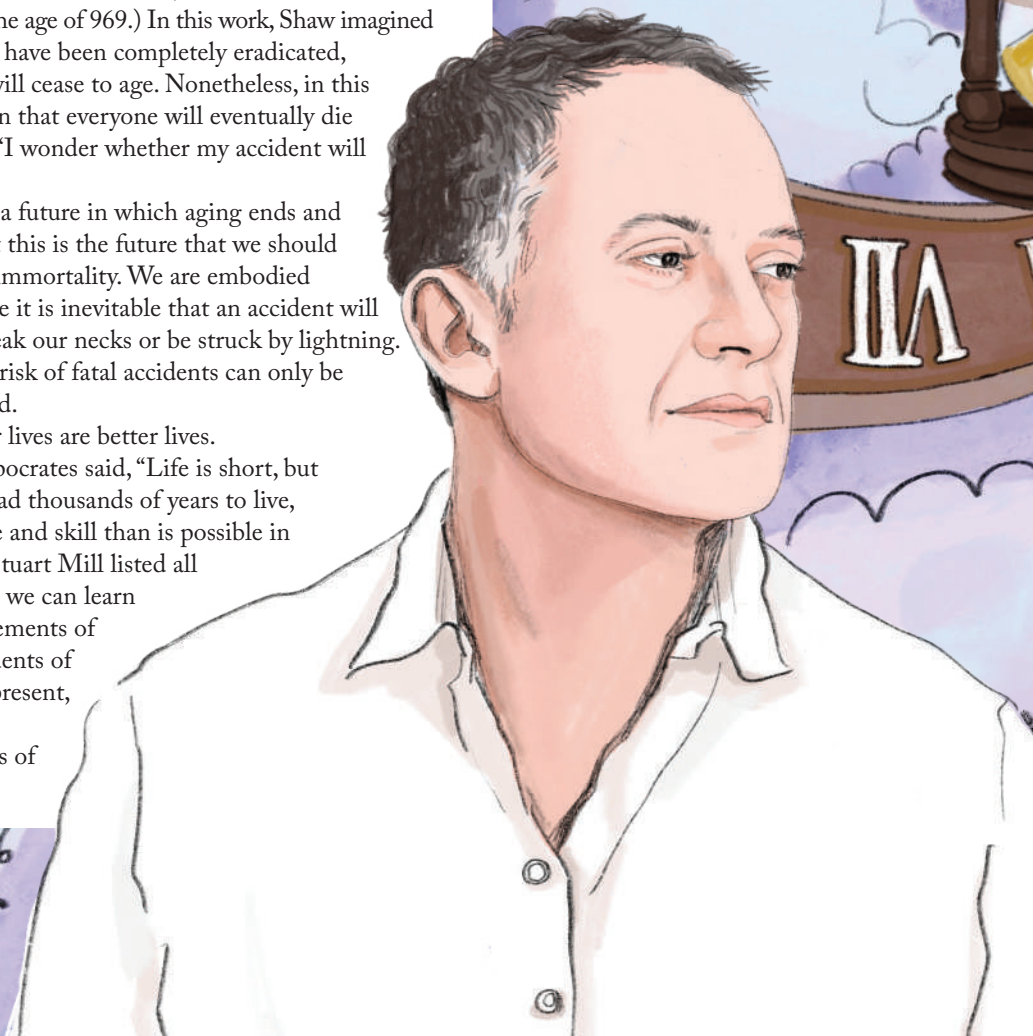
POINT / COUNTERPOINT

Immortality: Promise or Peril?

TWO PHILOSOPHERS DEBATE THE TOPIC.

"Other things being equal, longer lives are better lives."

Ralph Wedgwood is director of the School of Philosophy and a professor of philosophy



Over the last 200 years, the progress of medicine and public health has caused a dramatic increase in human life expectancy. In 1820, the global average human lifespan was just 26 years; in 1950, it was 49 years; today it is 72.9 years — and in Japan, 84.7 years. Most people believe that this is a good thing. Except in dire and unusual circumstances, most people want to live longer rather than shorter lives.

But where does this end?

The Irish playwright George Bernard Shaw speculated about this in the final act of his play *Back to Methuselah*. (In the Book of Genesis, Methuselah was the longest-lived Biblical patriarch, living to the age of 969.) In this work, Shaw imagined that 29,000 years from now, disease will have been completely eradicated, and after reaching adulthood, humans will cease to age. Nonetheless, in this future, it's regarded as statistically certain that everyone will eventually die in a fatal accident. They say things like: "I wonder whether my accident will occur in 100 or 1,000,000 years' time."

I suggest Shaw was right to imagine a future in which aging ends and death only comes by chance — and that this is the future that we should aim for. It is not realistic to expect true immortality. We are embodied biological beings, and given enough time it is inevitable that an accident will end our lives — we may just fall and break our necks or be struck by lightning. Even if we can make our lives safer, the risk of fatal accidents can only be reduced and never completely eliminated.

Still, other things being equal, longer lives are better lives.

As the ancient Greek physician Hippocrates said, "Life is short, but knowledge of a craft is long." If we all had thousands of years to live, we could acquire much more knowledge and skill than is possible in a mere 85 years. The philosopher John Stuart Mill listed all the inexhaustibly interesting things that we can learn about: "the objects of nature, the achievements of art, the imaginations of poetry, the incidents of history, the ways of mankind, past and present, and their prospects in the future." How wonderful it would be to have thousands of years to learn about them!



“Thanks, but no thanks, Methuselah.”

Other things being equal, longer lives *are* better lives! On this point, Professor Wedgwood and I agree. But of course, other things are not always equal.

In fact, we know that when it comes to lifespan, Shaw’s Methuselan future will be far from equal. Because we can still die from accidents, each of us will still face some small risk of dying each year of our lives — say, one in a thousand. If this risk is equally distributed, then every child can expect to live, on average, for a thousand years. But *expecting* to live for a thousand years is not the same as *actually* living for a thousand. At an attrition of one-thousandth each year, half will be gone before they’re 693, and fewer than two in five will see their thousandth birthday.

Six hundred and ninety-three years is not nothing. It is in fact more than long enough to be imagined by writers as diverse as Jonathan Swift (*Gulliver’s Travels*), Karel Čapek (*The Makropulos Affair*), Jorge Luis Borges (*The Immortals*), J.R.R. Tolkien (*The Silmarillion*) and Michael Schur (*The Good Place*) as — in one way or another — depressingly bleak. But it is also much less than 1,000. A minority, however, will live longer — much longer. Just 16 or so of today’s 8.2 billion people would still be alive after 20,000 years, each of whom could *still* expect to live another thousand years. This is roughly the current number of people in the world worth more than $100 billion.

Now, there is nothing wrong with inequality *per se* — variety is, as they say, the spice of life. But *vast* inequalities can easily be used to wield incredible power. And the 20,000-year-olds will not only live longer — they will *also* hold vast wealth. For time *is* money. Just a $1 investment in their youth in an S&P 500 index fund yielding a real return of 5% per year could easily result in $6x10^{423}$ dollars by their 20,000th year. Elon Musk could only drool at so many zeros.

The prospect of having an 11/12 chance of living longer than 78 years sounds great — as Professor Wedgwood says, “other things being equal.” But the absolute certainty of living in a world dominated by a tiny few whose sheer luck at avoiding accidents allowed them to accumulate power over the rest of us can’t be worth it.

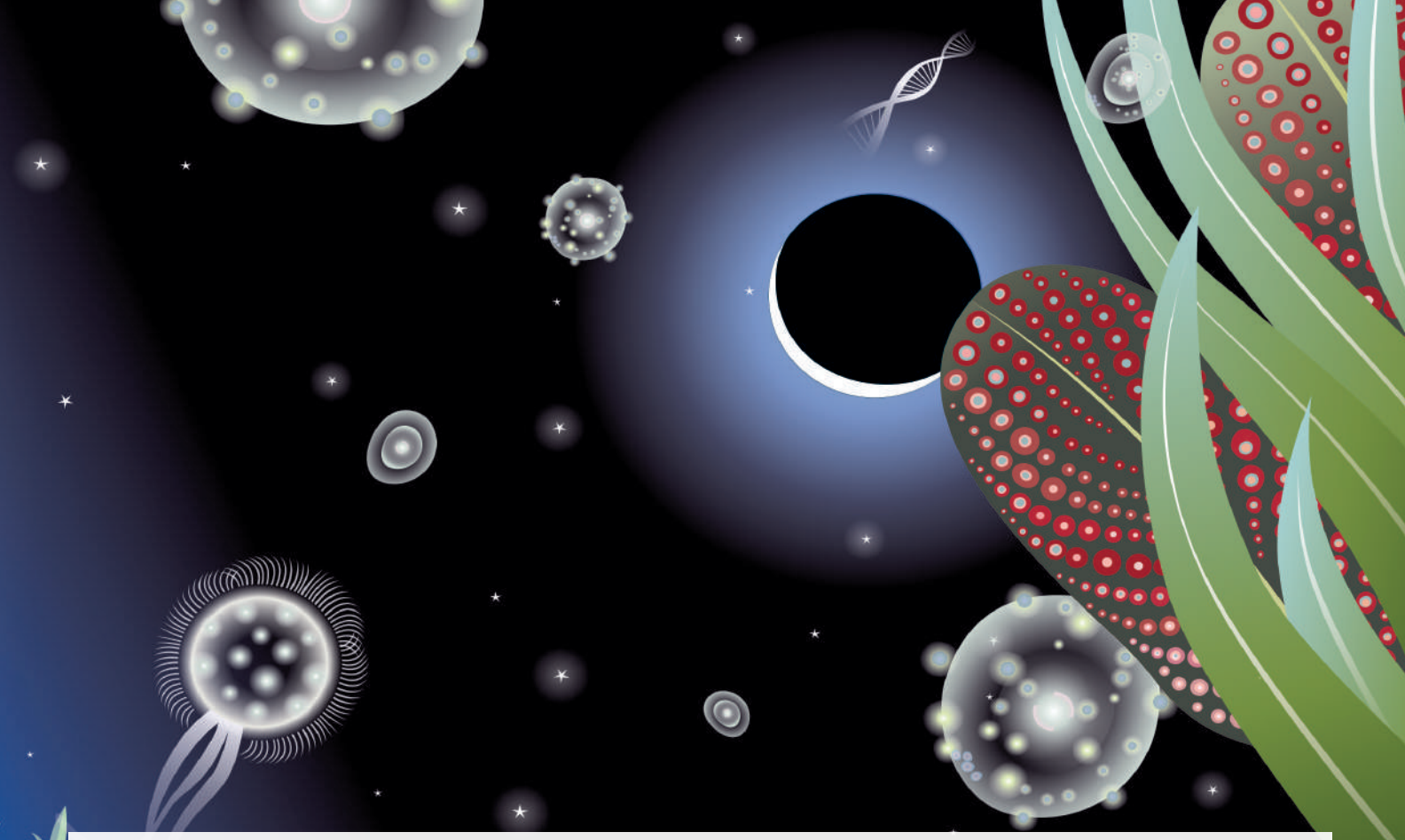
Thanks, but no thanks, Methuselah.

Mark Schroeder is a professor of philosophy

ILLUSTRATION: TATJANA JUNKER



ILLUSTRATION BY CHRISTIANE BEAUREGARD



Life

Readers of this magazine can certainly never accuse us of dodging the big topics. We've tackled so many, including energy, health, our beloved state of California — even mortality. What was left to explore? Life, of course — the whole big, messy, thrilling, heartbreaking, rollercoaster of it all. From how it all began with a giant bang to what our scholars are doing to preserve it to the meaning of the whole dang thing.

In the middle of putting together this issue, my son's father suffered a heart attack in Paris. We jumped on the first flight we could get. Too scared to turn our phones back on in case we were too late, we ran through the airport and jumped into a taxi to the hospital. We were lucky. We got there in time to spend two magical afternoons with him before a second heart attack snatched him from us forever.

He was an artist and a photographer. He left school at 14, yet among the more than 80 mourners at his funeral were acclaimed actors and musicians, artists and gallerists. He was curious about everything, always creating, always learning, passionate about art, books, history, politics, people and — most of all — photography.

He loved that I worked for a college of letters, arts and sciences. Though he sadly never had a chance to study at a place like USC Dornsife, he would have felt right at home here and would have loved every moment. He never had much money, but he knew the secret of life: He knew how to truly live.

Death puts life into context. His passing made me deeply grateful for every moment of living. I hope exploring our scholars' work in this issue brings you renewed appreciation for the beauty and wonder of life.

SUSAN BELL
Editor-in-Chief


BAM



Goes the Universe

BY MARGARET CRABLE

Almost 14 billion years ago, the universe gave birth to itself. In the manner of a glassblower shaping a molten orb, a tiny, exceptionally hot speck of dense material ballooned outward into vastness.

The event — known as the Big Bang — was an astounding burst of transformation. In less than a second, the universe likely doubled in size many times over. As it then began to cool, subatomic particles formed, followed minutes later by the lightest elements such as helium, hydrogen and lithium.

Remarkably, within just three minutes, the universe completed the first stage of its development. But it would take at least 100 million years — after the first stars ignited — for heavier elements to begin forming.

"It's hard to truly grasp how quickly the universe expanded and cooled during those first moments," says Kris Pardo, assistant professor of physics and astronomy. "Three minutes feels normal to us — but on that scale, it's almost impossible to comprehend."

KNOWN UNKNOWNS

Of course, the Big Bang remains a theory — "our current best guess" as to how the universe was formed, says Pardo. Key elements, such as "inflation" (a rapid expansion of the universe's size), still need confirmation.

"We think inflation likely occurred," he says, "mainly because it helps explain why our universe is geometrically flat, along with a few other cosmological puzzles. However, we haven't yet found direct evidence."

A key may lie in the cosmic microwave background, or CMB — a faint, lingering radiation that stretches to the edges of the universe. Dating back to just after the Big Bang, it serves as an invaluable cosmic clue.

Vera Gluscevic, associate professor of physics and astronomy, focuses much of her research on testing theories related to CMB. In April, she and Adam He, a doctoral student in physics, completed an analysis of data collected by the Atacama Cosmology Telescope, located in Chile's remote Atacama Desert. The images captured our clearest view yet of CMB — a snapshot of the universe when it was just 380,000 years old. Gluscevic and He were part of a team of 65 researchers from around the world who collaborated on this project.

It was a triumphant final round of images produced by the ACT, which was decommissioned in 2022. Gluscevic is now a research partner with the Simons Observatory Collaboration, also located in the Atacama Desert. It's home to the next generation of CMB telescopes, some of which are already in use at the observatory, with more on the way. These telescopes will enable scientists to study CMB with even more precision and will also produce the highest resolution images of the universe in its infancy ever captured.

"From this, we will learn not only about the origins of cosmic structures, conditions in the early universe, and dynamics of the whole universe across its history, but we will also answer some of the biggest questions about the fundamental quantum constituents of our physical reality, including neutrinos, dark matter and more," says Gluscevic.

Pardo's research focuses on dark matter, a mysterious, invisible substance found throughout the universe. Though it doesn't interact with light, dark matter exerts a gravitational pull that has shaped the very structure of the cosmos.

For the first 400,000 years after the Big Bang, strong radiation and electromagnetic forces prevented normal matter from coming together to form structures. But dark matter's relative imperviousness to these conditions allowed it to collapse into deep gravitational wells. As the universe cooled, ordinary matter fell into these pockets, eventually forming galaxies. Glittering night-sky spectacles, such as the Andromeda Galaxy and the Milky Way, owe their existence to this hidden cosmic scaffolding.

Pardo and Gluscevic co-lead the USC CosmoLab, a research hub for cosmologists and astrophysicists, based at USC Dornsife. The lab collaborates with scientists at institutions including Carnegie Observatories, the California Institute of Technology and NASA's Jet Propulsion Laboratory. It's also training the next generation of scientists who will advance our understanding of the universe's origins.

"CosmoLab has been important for us to both collaborate with nearby institutions, as well as bring that research to the many undergraduate and graduate students who work within the lab," says Pardo.



ORIGIN STORIES

Scientific theories explaining how the universe began echo, in some ways, one of our oldest proclivities: Humans have been telling stories about how and why our world exists since the dawn of consciousness.

These "cosmogonic" myths and religious teachings vary widely across the globe, says Tok Thompson, professor (teaching) of anthropology and coauthor, with Gregory Schrempp, of *The Truth of Myth*. "There are some common themes, but no universals. Instead, we find a dazzling diversity of thought on how life began," Thompson says.

Some origin stories center on a divine creator — for example, Christianity teaches that God created the universe in six days. Others, such as that of ancient Greek mythology, in which the gods emerged spontaneously from chaos, don't feature an omniscient mastermind at all.

Beliefs about human genesis vary just as widely, says Thompson: "In some traditions, we came 'down' from the heavens, while others — notably the widespread Native American Emergence Myth — maintain that we came up to this world from an underworld below."

Science may explain *how* the universe came into existence, but it doesn't address the question of *why*, Thompson observes. "In the end, myths are a search for meaning; science is a quest for objective truth," he says.



After Life

Just as ancient cultures created stories to explain the origins of the universe, the mystery of death has inspired diverse beliefs about what — if anything — comes next.

For some, death means the complete cessation of consciousness. For others, it's a doorway to another realm. Visions of the afterlife vary widely. Traditional Christian doctrine holds that a person's deeds on Earth determine whether they spend eternity in heaven or hell. In contrast, many Buddhists believe in reincarnation — a continuous cycle of rebirth among different life worlds of heaven, human, animals, ghosts and hell.

Yet, even Buddhists disagree about the exact nature of reincarnation. Mainstream Buddhist traditions teach that mean-spirited people are reborn as *pretas*, or "hungry ghosts" — a karmic retribution for misdeeds in a past life. While most Buddhist traditions acknowledge the concept of reincarnation, the question of who or what is being reborn remains highly contested. Many Buddhist schools reject the notion that reincarnation is tied to a distinct soul. "These monks say that rebirth is simply the

And while origin stories often parallel science in aiming to explain how we came to be, they also serve a distinct spiritual and psychological purpose, offering insights and meaning that go beyond what empirical evidence alone can provide.

"Science, at its root, stems from intrinsic curiosity — the desire to find out what's actually true," says Zlatan Damnjanovic, an associate professor of philosophy who teaches the course "Science, Religion and the Making of the Modern Mind."

"Religion is not about obtaining factual knowledge, but about answers to questions that are unknowable, such as what comes after death," he says. "Religion provides a framework of meaning for the world."

Even if science were to produce definitive proof of the Big Bang, it's unclear how much that would shift religious belief. "These things are abstract mathematical theories and formulae. Will they put an end to the questions? Probably not," says Damnjanovic.

After all, science knows little about what came *before* the Big Bang. The theory itself picks up a fraction of a second into the start of inflation. It's a bit like studying the sudden rise of a souffle without knowing what brought all the ingredients together.

What — or who — launched it all into action, and why, remain questions for theologians, philosophers and mythologists to interpret, at least for now.

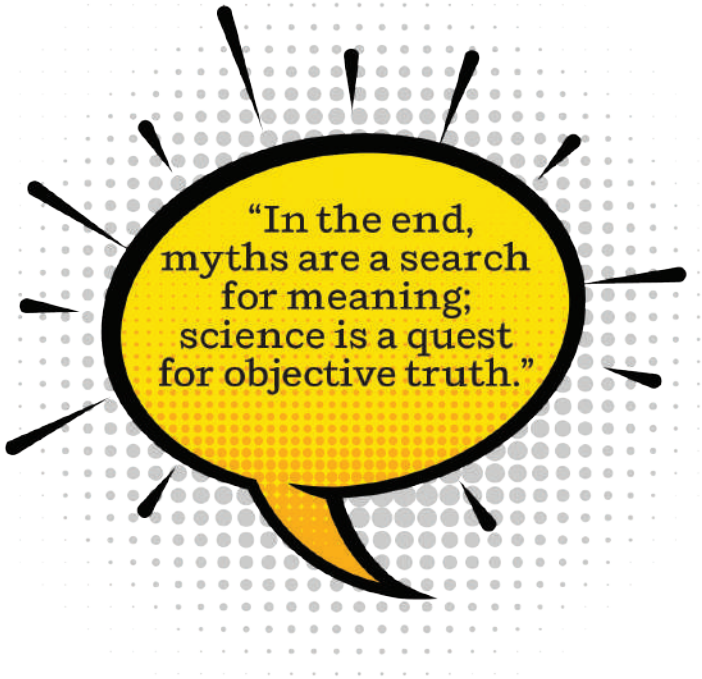


END TIMES

Scientists are also working to solve another cosmic puzzle: how the universe might end.

A central focus is dark energy — the mysterious, driving force behind the universe's accelerating expansion. Researchers had long believed this growth would continue indefinitely.

An alternative idea is emerging, although a formal scientific theory has not yet been developed. Dark energy may now be waning. If true, the universe's expansion could slow, then halt — and ultimately reverse. This cosmic contraction could culminate in an apocalyptic event that astronomers and physicists have evocatively dubbed the "Big Crunch."



The Dark Energy Spectroscopic Instrument at the Lawrence Berkeley National Laboratory in Kitt Peak, Arizona, which measures the effects of dark energy and the universe's expansion history, recently released data that supports this idea. Pardo notes, however, that confirmation will require similar findings from independent research teams.

The end of the universe isn't just a scientific question — it's long been a concern of religious and mythic traditions. Most don't view it as an event of perpetual annihilation. In spiritual teachings around the world, from Christianity to Hinduism to Zoroastrianism, a more hopeful theme emerges from doomsday stories — that of rebirth.

In ancient Norse mythology, for example, an apocalyptic event known as Ragnarök destroys the Earth, sun, moon — and even the gods. From this devastation, a new world rises, populated by just two human survivors.

If such an event were to come to pass, we can safely assume those two humans would once again set out to explain how it all began — and why. D

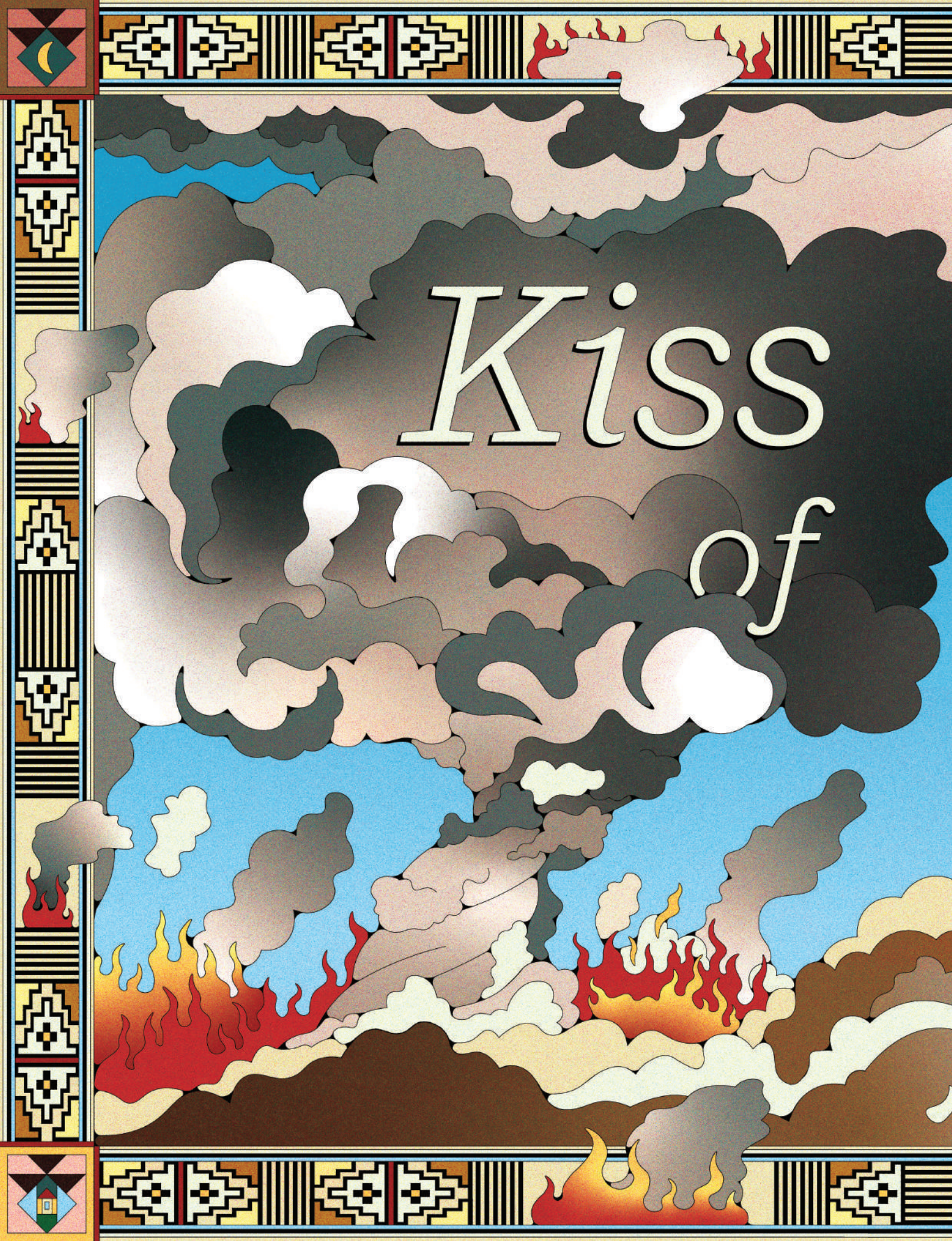
continuation of existence but without the transmigration of individual identity," says Jessica Zu, assistant professor of religion and East Asian languages and cultures.

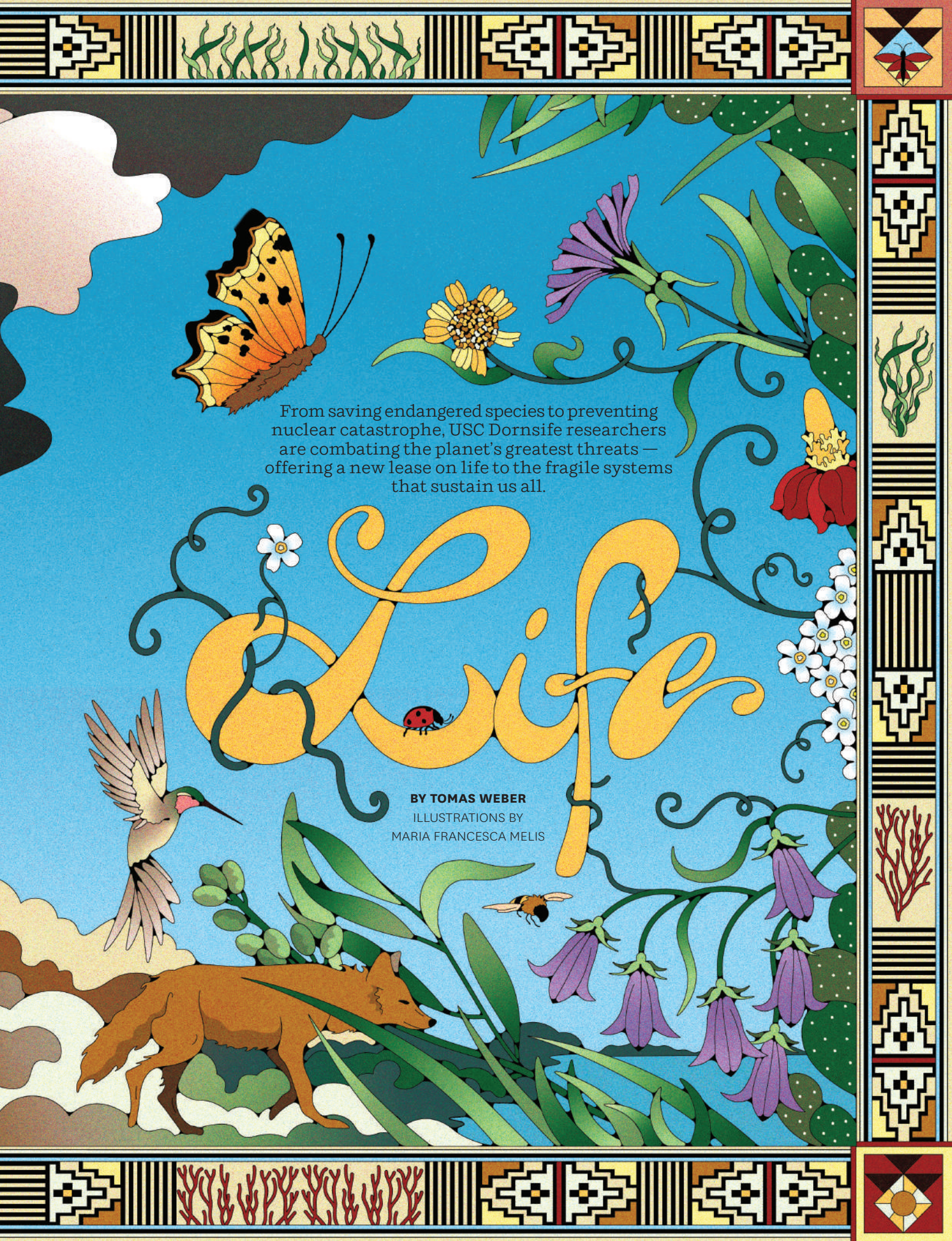
Religious teachings on the afterlife have evolved — sometimes dramatically. During the Reformation, for example, the Church of England rejected the Catholic doctrine of purgatory, a temporary place of suffering where impure souls are cleansed of sin before ascending to heaven.

This shift disrupted long-held Christian ideas around death and generated much anxiety for Elizabethan England, says Thea Tomaini, professor (teaching) of English. The era's unease is reflected in Hamlet's famous soliloquy, when he wonders, "What dreams may come / When we have shuffled off this mortal coil."

The human longing to transcend mortality continues to reveal itself in our enduring attraction to the illusion of eternal life. In the 20th century, cryonics promised bodily revival once technology caught up to the vision. Today, artificial intelligence fuels dreams of a transhumanist "cyber forever," where consciousness is uploaded to the cloud for perpetual existence, says Tok Thompson, professor (teaching) of anthropology.

And yet, freezers fail. Computers crash. Hamlet's "undiscovered country" may still await us all. —*M.C.*


Kiss
of



From saving endangered species to preventing nuclear catastrophe, USC Dornsife researchers are combating the planet's greatest threats — offering a new lease on life to the fragile systems that sustain us all.

Life

BY TOMAS WEBER

ILLUSTRATIONS BY
MARIA FRANCESCA MELIS

Last September, religious leaders, military personnel and nuclear scientists gathered at the University of New Mexico — just miles from the birthplace of the atomic bomb — to discuss protecting life on Earth from nuclear catastrophe.

Organized by the Institute for Advanced Catholic Studies (IACS), an independent research center based at USC Dornsife, the event, held in collaboration with the University of New Mexico, drew a uniquely diverse group: senior officials from recent presidential administrations, the head of the Los Alamos National Laboratory, local Indigenous leaders and "downwinders" — people exposed to radioactive fallout from weapons testing. Among the faith leaders attending were Archbishop Emeritus Joseph Mitsuaki Takami of Nagasaki, who lost family members during the 1945 atomic bombing of Japan; Cardinal Robert McElroy, the Archbishop of Washington; and Archbishop John Wester of Santa Fe, New Mexico.

"Our motivation was to reignite dialogue between serious thinkers about nuclear strategy and the ethics of nuclear weapons," says Richard Wood, IACS president, who was raised in the constant shadow of nuclear threat. Born in Los Alamos, New Mexico, home to the Manhattan Project, his father and brother worked at the National Laboratory.

The urgency was palpable at the forum. "People engaged in a new way," says Wood. "Some argued that deterrence is the right strategy, while others took the official position of the Catholic Church: that we urgently need multilateral, verifiable disarmament." With global tensions rising and nuclear arsenals expanding, the stakes for this dialogue have never been higher.

The nuclear strategy forum is just one example of how USC Dornsife scholars are working across disciplines to preserve life. Whether it's helping to prevent a nuclear apocalypse or restoring endangered ecosystems, they're identifying and combating some of our planet's most pressing threats with innovative science, practical policy and hands-on action.

RACE AGAINST EXTINCTION

For some species, the apocalypse has already arrived.

Seven years ago, marine biologist Carly Kenkel began transplanting hundreds of farmed coral specimens to reef habitats off the Florida Keys to study how they grow in natural conditions. But during the unprecedented Caribbean heat wave of summer 2023, she rushed to Florida — only to find 98% of her coral, and much of the surrounding reef, had died.

"A lot of sites were just devastated," says Kenkel, Wilford and Daris Zinsmeyer Early Career Chair in Marine Studies. "And in the Caribbean, whenever a reef is lost, it doesn't come back. This system has lost its natural capacity to heal itself."

In the wake of the catastrophe, many experts deemed Caribbean corals beyond saving, but Kenkel disagreed. Although the reefs can no longer recover naturally, she believed scientists could help by using pioneering techniques. "If we want to save the Caribbean reefs, our only hope is human intervention."

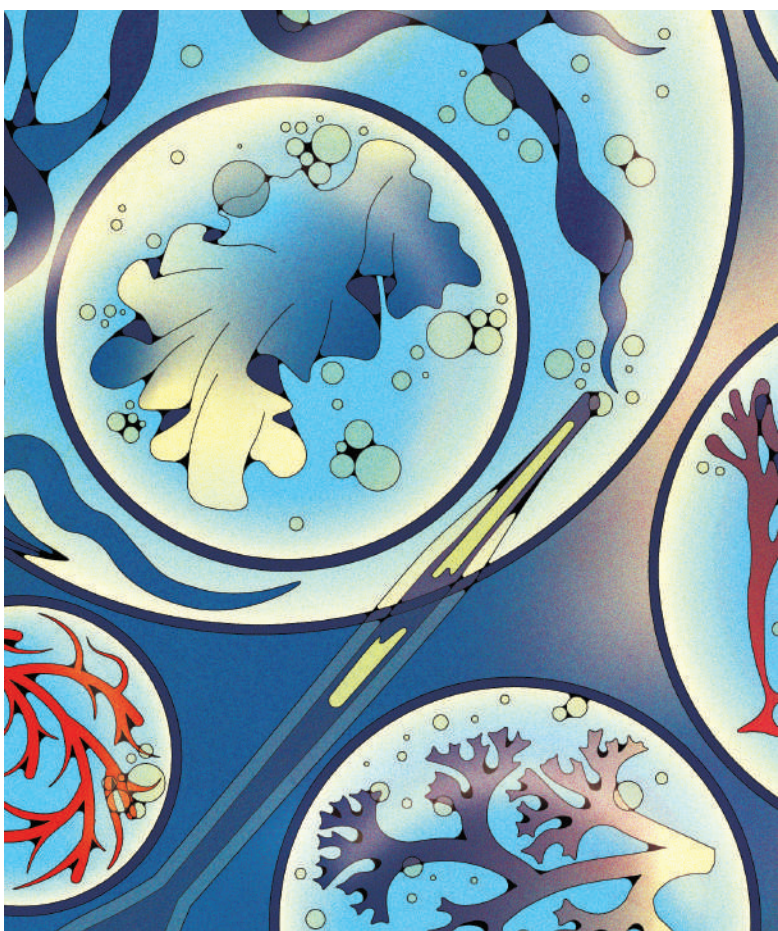
One of those novel methods is best described as IVF for coral: Scientists would freeze coral eggs and sperm for future use while banking living specimens in aquariums. This buys time while the world works to slow climate change. "It's a last-resort insurance policy," says Kenkel, associate professor of biological sciences. "But the biology is tricky. Spawning happens only once a year, so it's a race against time."

Kenkel and a team of coral scientists and conservation experts are pushing for an international biobank network to store coral genetic material and rapid-response teams to temporarily relocate coral during extreme heat events.

But coordinating action is no small feat. The Caribbean's coral reefs extend across more than 30 separate territories, each with its own regulations and priorities.

"From the coral's perspective, it's one interconnected system.

> "If we want to save the Caribbean reefs, our only hope is human intervention."



But from the human geopolitical viewpoint, it's much more complex," says Kenkel. Nevertheless, she's optimistic, citing a successful coral breeding program on Australia's Great Barrier Reef as proof that intervention can work.

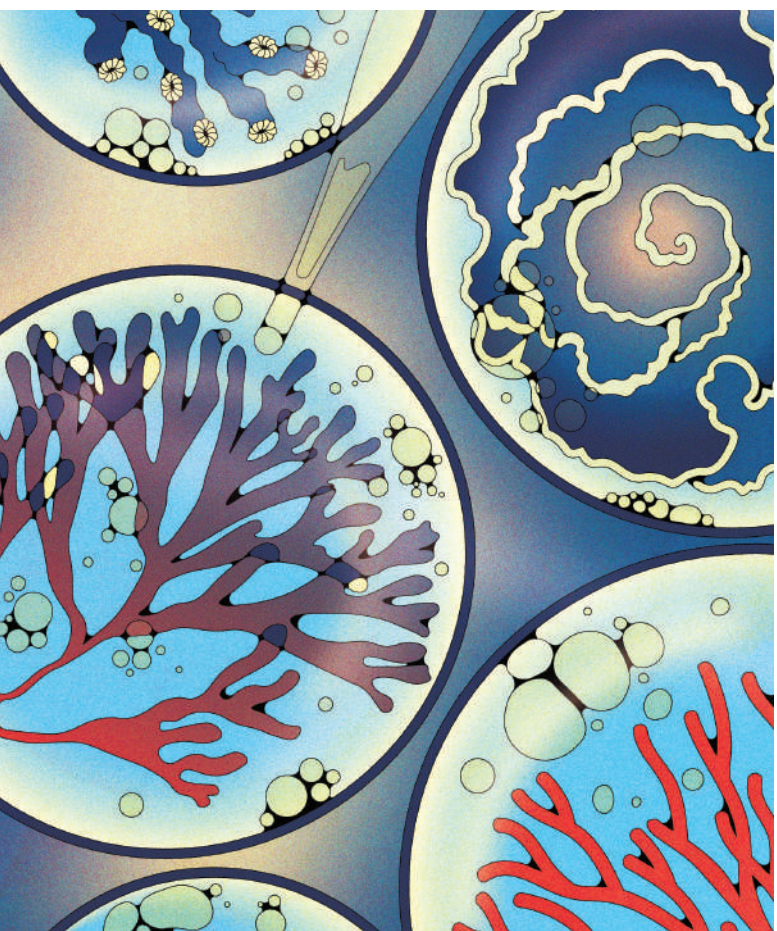
The Kenkel Lab is also researching why some corals can handle warmer waters better than others. Coral is a metaorganism — a partnership between the coral animal and the algae that feed it. By introducing more heat-tolerant algae, scientists can help corals adapt. "It's already happening naturally," Kenkel says, "but humans can speed up the process. It's the easiest lever to pull."

THE POWER OF THE OCEAN

Selectively breeding marine life isn't just good for biodiversity, it could also help fight climate change, restore polluted coastlines, support agriculture and open up a wealth of new business opportunities.

The waters off California's coast were once home to flourishing kelp forests. These fast-growing brown algae sheltered a teeming variety of marine creatures while absorbing megatons of carbon from the atmosphere every year. Kelp is also useful above sea level — its extract helps crops become more drought resistant, and the algae is used in everything from frozen foods to toothpaste and pharmaceuticals.

But kelp is sensitive to heat. When water temperatures exceed 70 degrees, it begins to die. Over the last decade, marine heatwaves have wiped out more than 90% of the kelp forests along a 200-mile stretch of the Northern California coast.



Biologist Sergey Nuzhdin has a rescue plan. In 2022, he founded Kelp Ark, a nonprofit kelp nursery and seed bank. The goal of this partnership between USC Dornsife and the University of Wisconsin-Milwaukee is to selectively breed kelp that can survive warmer waters and absorb more carbon from the atmosphere.

"If you planted wild kelp to absorb one gigaton of carbon, you would need roughly a million square kilometers," says Nuzhdin, professor of biological sciences. "But with kelp bred for higher carbon absorption, we estimate we would need only a fifth of that."

Nuzhdin envisions large-scale kelp farms off the coast of Los Angeles. Just five miles from Santa Monica, the Hyperion sewage treatment plant — one of the largest in the world — discharges treated wastewater into the ocean around the clock. The excess nitrogen fuels algae blooms, sickens marine life and pollutes L.A.'s beaches.

"If you put a kelp farm out there, it would suck up a substantial portion of that excess nitrogen from the wastewater," says Nuzhdin. "It would clean the water, make the beaches far more pleasant, help California agriculture — and turn a profit."

This year, though, Nuzhdin has an even more urgent task. In January, his team of Kelp Ark divers surveyed the murky waters off Pacific Palisades, looking for wildfire damage to kelp forests. What they found was an apocalyptic scene: Ash and debris had wreaked as much havoc on the underwater forest as they had on land.

Nuzhdin's race to stockpile genetic material from kelp and create more resilient varieties is on.

FIGHTING FIRE WITH NATURE

L.A.'s wildfires were fueled by a powerful accelerant: the city's hollowed-out ecosystem, says biologist and anthropologist Craig Stanford. In his new book, *Unnatural Habitat: The Native and Exotic Wildlife of Los Angeles*, he explores how fire-resistant native plants have been replaced by highly flammable non-native species.

"The single worst culprit in spreading L.A.'s January fires were the city's non-native palms," he says. "They catch fire easily, flames shoot up like torches, then jump to the next tree."

Stanford, professor of biological sciences and anthropology, lives just 300 yards from the Altadena power line suspected of sparking the Eaton Fire that devastated the historic L.A. County community. Miraculously, his neighborhood was one of the few in Altadena that was spared. "That was pure luck; the embers flew over our block in the strong winds and landed elsewhere," he says. But luck isn't a strategy. To limit future damage, Stanford recommends planting native trees such as oaks and sycamores, which can block airborne embers and resist ignition.

"In January, embers hit the crown of these trees, but didn't ignite them," he says. "That's strong evidence that native trees are essential. Exotic trees should be replaced with natives."

He is encouraged by L.A.'s growing native plant movement. More homeowners are replacing lawns with sages, salvias and California lilacs — plants that not only resist fire but feed native



bees. "If just one or two households per block in America made the switch," says Stanford, "we would create a mosaic that would be the largest national park in America. And it's slowly happening in L.A., which is great news."

Stanford's conservation work doesn't stop in Southern California. He also helps fight the lucrative illegal trade in turtles and tortoises — Earth's most endangered animal group. As chair of the Tortoise and Freshwater Turtle Specialist Group of the International Union for the Conservation of Nature, he works with law enforcement around the world to investigate and shut down traffickers.

"Because turtles and tortoises live so long, they're considered valuable investments in parts of Asia," he says. "Some fetch up to $100,000. That kind of high demand is wiping them out."

Still, Stanford remains optimistic. As a board member of the Turtle Conservancy — one of the largest nonprofit landowners in Mexico — he's involved in the creation of wildlife sanctuaries where USC Dornsife students can conduct field research. And he's seen sea turtles make an impressive comeback.

Twenty years ago, conservation groups helped end the sea turtle egg trade in some regions by hiring former poachers to work in ecotourism, introducing visitors to the wild animals they once hunted for cash. "Now, sea turtle populations in some areas are booming," he says. "Whether it's habitat protection, captive breeding or working with law enforcement, there are almost always solutions."

But even when conservationists manage to save a threatened species from the brink of extinction, Stanford says, researchers can't just pack up and go home. Ongoing monitoring is essential.

THE ROAD TO CONSERVATION

In the 1990s, the island fox — a cat-sized animal found only on California's Channel Islands — experienced a catastrophic decline and was on the brink of extinction. But by 2016, thanks to a famously successful captive-breeding program, the species was removed from the endangered list.

"It was one of the greatest conservation success stories ever and the fastest mammal recovery in the history of the Endangered Species Act," says biologist Suzanne Edmands.

But Edmands recently discovered a silent threat. After analyzing genetic samples from before and after the population crash, the professor of biological sciences found that the genetic diversity of the foxes had dropped dramatically.

"Despite all the celebrations about the population rebound, the genetics are even worse than they were before," she says. "That makes them highly vulnerable to disease and environmental change."

Edmands hopes her findings will lead to more rigorous monitoring of island foxes — and serve as a reminder that numbers alone don't tell the full story of recovery.

A FUTURE WORTH PROTECTING

Most people agree it's worth saving island foxes, coral reefs, sea turtles and kelp forests. But implementing nuclear disarmament? That's a harder sell. Many believe well-stocked nuclear arsenals are essential to global stability.

Still, the forum organized by IACS last fall offered a glimmer of possibility. Wood, the institute leader, says the gathering brought people together with starkly opposing views, yet a shared concern for humanity's future.

"There was deep disagreement in the room," he recalls. "It's a difficult moment in American culture for constructive public dialogue." But something shifted. Catholic thinkers, nuclear strategists and other intellectuals engaged respectfully and seriously with each other on one of the world's most existential threats.

"Sometimes," Wood says, "preserving life starts not with a breakthrough or a new discovery, but with listening, thinking and talking in good faith. I think that's the first step forward." D

BONUS: Download a sketch of the Channel Island fox illustration as a coloring page. Visit **bit.ly/Kiss_of_Life**

LIFE SAVERS

Ingenious medical innovations that have saved countless lives.



(a)
Tourniquet



(b)
Defibrillator



(c)
Heimlich maneuver



(d)
Narcan

(A) TOURNIQUET

In the fourth century BCE, Alexander the Great's army was among the first to use the tourniquet, saving innumerable soldiers from fatal bleeding. Twenty-five centuries later, uncontrolled blood loss remains the most common cause of death from traumatic injury. Tourniquets were originally fashioned from bronze and lined with leather, while the modern versions are usually made of nylon or rubber. Their function, however, has not changed.

(B) DEFIBRILLATOR

Ventricular fibrillation, an abnormal heart rhythm, was largely untreatable until 1947, when Ohio cardiac surgeon Claude Beck made history. During surgery on a 14-year-old boy, Beck applied an electric shock directly to the adolescent's heart, restoring its rhythm and saving his life. It was the first use of the experimental device, invented by electrical engineer William Kouwenhoven, on a human heart — and it paved the way for modern cardiac resuscitation. Today, if defibrillators are applied quickly, 70% of people experiencing cardiac arrest can survive.

(C) HEIMLICH MANEUVER

Thanks to American thoracic surgeon Henry Heimlich, the fourth most common cause of death in the United States — choking — is preventable. The first documented use of the Heimlich maneuver was by a retired restaurant owner in 1974. After reading a newspaper article about Heimlich's novel method for forcing trapped food out of the windpipe, Isaac Piha came to the rescue of a neighbor choking on a piece of chicken. To date, it's estimated the maneuver has prevented the choking deaths of more than 100,000 people.

(D) NARCAN

Opioid overdoses meant almost certain death until Narcan — an antidote for opioid poisoning — changed the landscape. Developed in 1961 by pharmaceutical researchers Jack Fishman and Mozes Lewenstein, this medication remained a little-used hospital treatment for decades. That changed in 1996 when a Chicago addiction treatment center began distributing Narcan to patients, turning it into a game-changer in overdose prevention. Today, it's estimated Narcan has saved millions of lives.

But today's powerful opioids are outpacing the antidote. Fentanyl, the deadliest drug in the United States, kills more than 100,000 people annually and can render Narcan ineffective. So, three USC Dornsife professors are working on a stronger version. Early laboratory trials have been promising. Clinical trials are the next step.

"A new, much stronger and longer-lasting opioid antidote could save people in severe fentanyl overdose cases where Narcan cannot," says Vsevolod "Seva" Katritch, professor of quantitative and computational biology, chemistry and pharmacology and pharmaceutical sciences, who is working with Vadim Cherezov and Valery Fokin, both professors of chemistry. "A stronger antidote would be a huge breakthrough," says Katritch. —*T.W.*

What's the Point?

Philosophers tackle life's biggest question — and offer some surprising answers.



BY TOMAS WEBER
ILLUSTRATIONS BY JOSIE NORTON

"So, what's it all about, then?"

a London cab driver once asked British philosopher Bertrand Russell. Perhaps thrilled to have one of the world's great thinkers in the back of his taxi, the driver seized the opportunity to pose a question as old as time itself: What does it all mean? But to his surprise, Russell didn't have a ready answer. "And, you know, he couldn't tell me!" the cabby later recounted.

You might think this is exactly the kind of question a philosopher, of all people, should have nailed. But the search for life's meaning is a thorny conundrum — especially for those who devote their careers to thinking about it. Philosophers often care less about answers and more about the right questions. Some even argue that "What is the meaning of life?" might not be a meaningful question at all.

"What do we even mean by 'the meaning of life,' anyway?" asks Stephen Finlay, an adjunct professor of philosophy who taught a USC Dornsife course of the same name for several years. Does it suggest a single, objective meaning that applies to everyone? And if not, should that leave us disheartened? Or is it possible that meaning varies — that different lives might hold different meanings?

Untangling these questions requires patience and careful thought. But for many students, engaging with them can be a profoundly transformative experience. "It's often the first time students have seriously confronted these questions," says Finlay. "But they are questions and ideas that, once contemplated, are never forgotten."



GRAPPLING WITH MORTALITY

Many students begin the course assuming that life will be meaningful if it has an objective purpose. But Finlay is quick to challenge that idea. To make his point, he plays a clip from the film *The Matrix*, illustrating how even a life with a clear, objective purpose can be devoid of any satisfying meaning. "Why are we here?" he asks. "Well, this movie provides an answer: We're being farmed by machines to provide energy. That's the entire purpose of our existence." Finlay pauses, then poses the deeper question: "So, do you feel that this information would give you an answer to the meaning of your life? Or would it instead suggest that your life is utterly meaningless?"

To push students further, Finlay opens the course with a discussion of death and suffering, asking them to consider what might happen to their bodies after death. Why so macabre off the bat? He explains that the idea of life ending with the body's destruction was a key reason 19th-century philosophers began questioning whether existence has any meaning at all. Two centuries later, Finlay says, jolting students out of their comfort zone remains a powerful way to alert them to what's at stake for them personally.

"How can life be worth living when we are going to die and all memory of us will eventually be obliterated?"

"Most students have never grappled with their mortality. A little bit of doom and gloom, even some shock and horror, is effective in waking people up to issues they're usually very comfortable ignoring," Finlay says. "How," he asks, "can life be worth living when we are going to die and all memory of us will eventually be obliterated?" This was Tolstoy's question. One of the first major writers in the European tradition to grapple with the possibility that life might be ultimately meaningless, the Russian novelist experienced a profound existential crisis in the 1870s. Originally an atheist, Tolstoy became consumed by the question of life's purpose — a question that, according to Finlay, "began to gnaw at him, eventually becoming an all-consuming blackness as he wondered: How can anything have any value if it's all going to crumble to dust and be forgotten?"

SHAKING THE FOUNDATIONS

While Tolstoy may have felt the weight of meaninglessness more than most, he wasn't alone. The 19th century was a time of deep existential unease, as advances in biology and geology began to shake faith in traditional religious teachings. The idea that humans had evolved from apes, or that Earth's history extended far beyond the Biblical timeline, raised unsettling questions about our place in the universe.

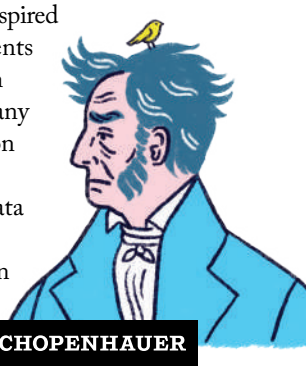
"Some of the anxiety stemmed from the rise of modern science, which revealed a vast cosmos and an immense timescale," says Ralph Wedgwood, director of the School of Philosophy at USC Dornsife and professor of philosophy. "We began to appear to be minuscule, insignificant — almost infinitesimal — fragments of the universe." Recent scientific breakthroughs — including the realization that our galaxy could contain billions of potentially Earth-like planets — have shrunk humanity's significance further still.

After a period of deep anguish, Tolstoy found solace in Christianity, placing his trust in religious tradition to restore meaning to his life. But other 19th-century thinkers, equally consumed by the question of life's purpose, couldn't find their answers in God.



NIETZSCHE

The German philosopher Arthur Schopenhauer, deeply influenced by Buddhism, believed the secret to a meaningful life lay in eliminating desire, which he saw as the source of all suffering. English utilitarian philosophers such as Jeremy Bentham and John Stuart Mill proposed a contrasting answer: The meaning of life, they argued, is to maximize pleasure and minimize pain. That philosophy later inspired contemporary movements like effective altruism, in which adherents — many of them based in Silicon Valley — believe we should use logic and data to determine how best to help others, and then devote our lives to that cause.



SCHOPENHAUER

HAPPINESS ISN'T THE ANSWER

Friedrich Nietzsche had little patience for the utilitarians. In this German philosopher's view, a hedonistic quest was not the purpose of life. "Mankind does not strive for happiness," he wrote — adding wryly, "only the Englishman does that." Instead, Nietzsche believed the meaning of one's own life must be invented, not discovered. French existentialist philosophers Jean-Paul Sartre and Albert Camus later echoed that view, arguing that life has no inherent meaning and that it's our responsibility to create one for ourselves.

"The existentialists thought that, if there is no God, then it's up to us to shape the truth about who we are," says Finlay.

The USC Dornsife philosopher embraces that existential outlook himself. Finlay firmly rejects the idea that life comes preloaded with some external meaning, waiting to be discovered. "As human beings, we try to impose artificial and false simplicity onto a

What it Means to Be Human

In the age of artificial intelligence, does the definition of humanity need a reboot?

Consciousness is often touted as the defining trait that distinguishes humans from our fellow animals. Yet, consciousness is an immensely murky concept. Despite centuries of inquiry, there is still no consensus on what it is, or even where it begins and ends. As Tok Thompson, professor (teaching) of anthropology, says, "Nobody's seen it, nobody's touched it, so how different is it from the mystical concept of 'the soul'?"

It's such an exasperating tangle that some philosophers call consciousness the "hard problem." It's not getting any easier.

Robust intelligence and language skills are generally considered core markers of consciousness, yet researchers are increasingly finding these traits among nonhuman animals. Artificial intelligence passes both those tests with ease. Does the definition of humanity need an update?

ALL CREATURES GREAT AND SMALL

The intellect of animals like dolphins and apes has long challenged our exclusive claim to consciousness. Dolphins call each other by name and can recognize themselves in mirrors earlier than human children can. Some apes make simple tools, similar to our own. And scientists recently discovered that bonobos may be able to recognize when humans are confused, stepping in to assist.

Even less advanced organisms surprise us. A single-celled, brainless slime mold (*Physarum polycephalum*) can solve mazes. And growing research on animal intelligence continues to lead to startling discoveries, such as the distinctive personalities and capacity for play exhibited by octopi — traits that recently led the United Kingdom to reclassify the eight-armed mollusks as sentient.

Our own thoughts are also not entirely our own. The millions of microorganisms residing in our gut have been found to shape our mood. So do other organisms. Thompson is currently researching *Toxoplasma gondii*, a neurological parasite that infects about a third of the world's population and changes the temperament of its host.

"When I say, 'I think x,' this 'I' is composed of a vast chorus of agents," says Thompson, whose 2019 book *Posthuman Folklore* explores the meaning of "human."

CAN YOU FEEL IT?

Now, AI is adding a new level of complexity to defining personhood. AI has reportedly passed the Turing Test, once considered the gold standard for identifying robots. Large language models like ChatGPT have outperformed nearly 90% of human test-takers on medical licensing exams and the bar exam.

But is artificial intelligence truly intelligent? "There is a lot of dispute about how intelligent it is, whether it is *actually* thinking and reasoning," says Jake Monaghan, assistant professor of philosophy. "At least some models don't do arithmetic but oddly 'guess' at the solution to a long division problem. So, whatever is going on, it's very different from human cognition."

That's because AI doesn't think like we do — it *computes,* notes Thompson. True thinking is biological: billions of physical neurons and synapses processing thoughts. The same goes for emoting.

"AI can't feel because feeling is based on biological hormones like dopamine and serotonin. AI may — and often does — say that it 'likes' or 'loves' people, but this is a lie, told without a twinge of guilt," says Thompson.

THE HUMAN FACTOR

Paradoxically, artificial intelligence may help us better define what it means to be human. For all its supposed verisimilitude, AI frequently stumbles in its attempts to imitate us.

Its glitches and gaffes spotlight our distinctiveness. "AI slop" has already emerged as a catchall term for AI-generated content that fails to ascend to a human standard of artistry and wit. When Meta CEO Mark Zuckerberg recently pitched AI chatbots as friends, novelist Walter Kirn quipped in response: "But can they help you move a couch?"

Research by Jonathan Gratch, research professor of psychology, found that interactions with AI chatbots didn't improve a participant's overall sense of connectedness, although they did make people less motivated to engage with their friends.

"I suspect that AI will satisfy 'empty calorie' needs, such as convincing us how great and wonderful we are, rather than challenging us and helping us to grow," says Gratch, also a research professor of computer science at USC Viterbi School of Engineering. In that sense, AI spotlights the irreplaceable value of humanity.

For all its purported intelligence, AI does not have its own morality, culture or religion. All of what it offers was taken from humans, from thousands of years of collective creativity and scholarship. "AI gathers its sources from us. It is not better than us in this sense, it *is* us — with all our prejudices, errors and biases," says Thompson.

It also cannot grieve or demonstrate compassion, something both humans and animals do. Ultimately, we may find that humanity has far more in common with mice — which USC researchers recently discovered give their littermates CPR — than with the AI writing tomes about the mysteries of the stars.

Perhaps the Turing Test should be updated to consider whether one can cry without instructions to do so. It's an idea already advanced by Philip K. Dick, whose robot detection test in his science fiction novel *Do Androids Dream of Electric Sheep?* relied on emotional responses to sniff out machines from humans. Set in the year 2021, it wasn't too far ahead of the challenges we're facing in 2025. —*M.C.*

Headstart for Happiness

Eager to learn the secrets to achieving and maintaining happiness? USC students certainly are: They are flocking to Patricia George's popular discussion-based course, "Happiness: Research in Neuroscience and Positive Psychology." The course enables students to study the science of happiness while engaging each week in different activities proven by research to improve mood.

George, an assistant professor (teaching) of psychology, says that about 50% of our happiness is determined by genetic factors and another 15% by circumstances beyond our control. But she emphasizes an uplifting truth: 35% of our happiness is totally up to us.

"As a result, we should feel empowered to take control of our own happiness," she says. "By regular practices that focus on positivity, we can consistently improve our mood." —*S.B.*

5 EASY WAYS TO BOOST YOUR MOOD

1 **CULTIVATE SOCIAL CONNECTION** Whether it's a phone call, meeting for coffee, or a walk with a friend, spend time with people you care about. Strong social bonds are the most important factor in boosting joy and well-being.

2 **PRACTICE GRATITUDE DAILY** Name five things you're grateful for and reflect on why. "By consciously practicing gratitude, we retrain our brain to notice and appreciate the good in our lives" says George. That helps rewire our brains for happiness.

3 **MEDITATE REGULARLY** Meditation is another powerful tool for rewiring the brain, helping us stay calm in the face of negative events.

4 **EXERCISE OFTEN** Physical activity is more than a great way to burn off stress and manage negative emotions; it also releases endorphins and dopamine — chemicals that boost pleasure and well-being.

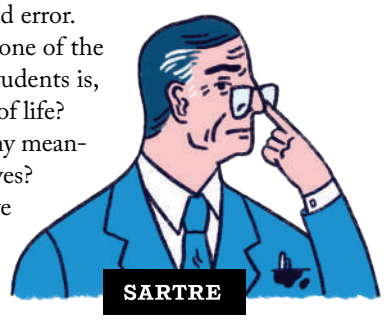
5 **PRIORITIZE SLEEP** Quality sleep is vital to our mood and cognitive functioning.

Scan here to discover more about Patricia George's course on happiness.

chaotic world," he says. But does that mean life is pointless? Not necessarily. "I'm not a raving nihilist," Finlay insists. Nietzsche, he believes, was on the right track. There can be joy in shedding illusions and facing reality head-on. "There's a joyful wisdom in being able to look the world in the eye, see it for what it really is, and say, 'Yes, bring it on. I want this.'"

It's an idea, says Finlay, that can feel exhilarating. If there's no single, objective meaning to life, we are free to shape our own. And while existence may not come with a built-in purpose, life can still hold many meanings — ones that resonate with us personally and offer feelings of happiness and fulfillment. From this perspective, pinpointing the meaning of one's life becomes a process of exploration, trial and error.

Finlay says that one of the questions he asks students is, "Why *the* meaning of life? Might there be many meanings for different lives? Might your life have different meanings at different times?"



WISDOM, KNOWLEDGE AND VIRTUE

Wedgwood, however, offers a very different perspective. He's more persuaded by the Ancient Greek philosophers, who, while they never explicitly asked about "the meaning of life," were interested in its purpose. And for thinkers like Plato and Aristotle, that purpose was clear: The aim of life is self-perfection — the pursuit of wisdom, knowledge and virtue.

"Some people think that sounds terribly self-centered," says Wedgwood. "But almost all the ancient philosophers who advocated some version of this view insisted that playing your part within the communities to which you belong is also a crucial element of self-perfection."

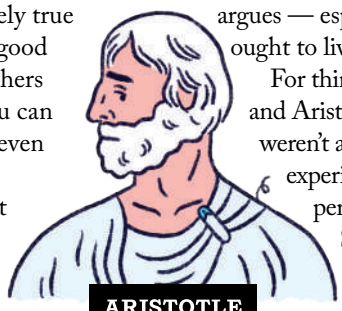
Wedgwood's perspective, he admits, is a "minority view." While many philosophers dispute the existence of a universal purpose to life, he insists there is an objectively correct answer to how we should live. He acknowledges the difficulty of determining what makes a life good, but he defends the view that it is possible to live an objectively good life — or an objectively bad one — and that some people fall short of their potential.

Humans, he argues, have certain capacities,



"There's a joyful wisdom in being able to look the world in the eye, see it for what it really is, and say, 'Yes, bring it on.'"

including the unique ability to reason. Realizing those capacities, he says, is what it means to live well. "Individuals definitely do find different paths through life, different experiments in living," he says. "But it's still objectively true that some of those paths are good and reasonable ones, while others are bad and unreasonable. You can have a view that accepts and even celebrates diversity in human beings while still holding that virtues — such as courage and fair mindedness — are fundamentally objective."



ARISTOTLE

THE DARK SIDE OF GREEK PHILOSOPHY

The Ancient Greek philosophers, in fact, did accept that different people might have different goals and capacities. But for Assistant Professor of Philosophy Merrick Anderson, that very idea points to an abhorrent aspect of Aristotle's legacy: his defense of slavery.

"Aristotle is notorious for having defended 'natural slavery,'" says Anderson. "What he meant by that is certain people are just born ill-equipped intellectually to figure out how to lead their own lives."

It's an odious idea. And yet, even if their values sometimes clashed with ours, the Ancient Greek philosophers were still asking the right questions, Anderson argues — especially about how we ought to live.

For thinkers like Plato, Socrates and Aristotle, those questions weren't abstract thought experiments. They were deeply personal and political. Socrates, after all, was sentenced to death for encouraging others to question traditional beliefs — a reminder that, in some eras, simply asking how to live can carry life-or-death consequences. "They were the first people to ask how we should live in a systematic way," says Anderson. "That is a major philosophical accomplishment, and it's something we owe to them."

NO EASY ANSWERS

So, the next time a cab driver asks Finlay the meaning of life, how will he respond? Like Russell, he might demur. His goal as a philosopher and teacher, he says, isn't to deliver easy answers. "Humans want to be able to boil things down to a simple idea," he says. "And the search for the meaning of life is partly a symptom of that desire for simplicity — the desire to understand things that are complicated."

Fundamentally, Finlay thinks the idea that there's a single, objective answer to how we should live is a comforting fiction. "How on Earth do you prove the existence of these 'meanings' of life?" he asks. "I don't think any philosopher has ever succeeded in providing any good evidence for them. It seems to me that what it comes down to is a strong desire for them to be true."

Instead of offering an answer, Finlay's goal is to encourage his students to wrestle with the question of life's meaning themselves. "The course gives them a palette of options," he says. Many arrive with what he calls a package deal — often shaped by a religious tradition — about what life is supposed to mean.

A Christian, for example, may believe that the meaning of life is to know and glorify God. Finlay never challenges his students' religious beliefs, and some may even leave the class with their faith strengthened, much like Tolstoy, who found renewed meaning through religion after a period of deep doubt. But ultimately, Finlay hopes that students walk away with something deeper: not an answer, but a readiness to ask better questions. "I hope they leave the course with a deeper understanding," he says, "so that when they face this question later in life, they are better equipped to explore their own answers." D



Buried





After a grueling descent into the crater of Costa Rica's Poás Volcano, pioneering geobiologist Karen Lloyd paused to catch her breath as she took in the dramatic beauty of the landscape, then turned to the local researcher next to her.

"So," she asked, glancing warily at the sputtering crater of acid at her feet, "what's our exit strategy again if this thing goes off?"

Alive

BY SUSAN BELL

"That's easy," he laughed. "Just turn around and admire the view. Because it's going to be the last one you'll ever see."

Fortunately for Lloyd and her colleagues, their research expedition to collect samples of subsurface life from the subduction zone around the volcano passed without incident.

But just 54 days later, the sputtering burst into a furious torrent of ejected boulders and the spectacular view disappeared, engulfed in a dark, mushrooming cloud of volcanic ash as Poás erupted in what was Costa Rica's most serious volcanic episode in more than 60 years.

For Lloyd, known for her groundbreaking work in microbial geochemistry, that moment eight years ago was more than a brush with danger — it was a reminder of the high-stakes environments her field depends upon to gain understanding of the deep workings of our planet.

Over the past two decades, that understanding has undergone a radical shift. Lloyd, Wrigley Chair in Environmental Studies and professor of Earth sciences, is part of a global group of scientists behind a major discovery that is transforming how we think about life on Earth. The scientists revealed the existence of a vast, previously hidden world of living biomass inside the planet's crust. This biosphere consists of active microorganisms, hundreds of millions of years old, that are thriving in extreme environments once thought uninhabitable.

As Lloyd details in her new book, *Intraterrestrials: Discovering the Strangest Life on Earth*, these subsurface microbes can survive in boiling water, acid — even bleach. Some can "breathe" rocks, metals or electrons. Some are hundreds of thousands of years old. All live in ways completely alien to us surface dwellers.

"Overcoming the challenges of sample contamination to find conclusive proof took years of painstaking work, but the evidence is now overwhelming," Lloyd says. "These deep-life microbes are real. They're alive and they have decidedly weird lifestyles — doing strange, fascinating things we're only just beginning to understand."

To hunt them down, Lloyd and her colleagues explore permafrost in the Arctic, hot springs in Iceland, rift basins in the American Southwest, and volcanoes in Costa Rica, New Zealand and the Andes. In these places, tectonic activity squeezes ancient groundwater to the surface — much as we might wring out a washcloth — creating natural laboratories for studying Earth's hidden biosphere.

Each location offers a different window into Earth's deep history, where materials are exchanged between the surface and the subsurface world. In New Mexico's rift basins, the ground stretches apart, pulling up ancient fluids. In Idaho, springs near old Yellowstone hotspots mark how the continent has drifted. Iceland, in contrast, sits atop both a spreading center *and* volcanic hotspot, producing a radically different subsurface chemistry.

SUBSURFACE SURVIVORS

Lloyd — a marine biologist by training whose work builds on the trailblazing research of USC Dornsife professors Kenneth Nealson and the late Katrina Edwards and Jan Amend — also explores microbial life thriving beneath the ocean floor. This research into deep sea sediments enables Lloyd to dive not just into the ocean, but into time itself, peering back to the dawn of life on Earth.

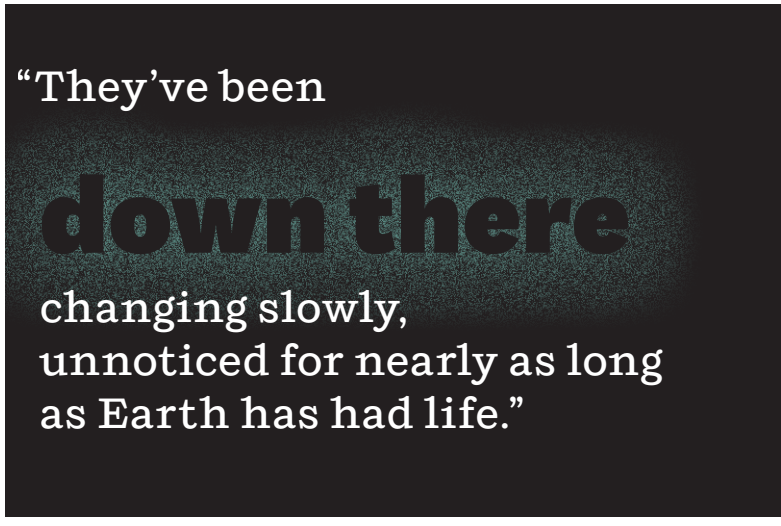
Her team uses drills, push cores and even submersibles to retrieve mud from the ocean bottom, extracting it in cores and slicing it into layers to analyze the microbial life within.

Deep-ocean mud might not sound too thrilling an environment, but to Lloyd it's a portal into a mysterious and exciting secret world.

Imagine, she says, being a microbe. You fall to the seafloor in a slow rain of organic detritus — dead plankton, river runoff, sunken particles. Then you're buried, grain by grain. You end up meters below the sea, where nothing much happens. For hundreds of thousands — sometimes hundreds of millions — of years.

"And you keep living for all that time," she says. "These are not lively lives. There's not enough energy down there to reproduce. But they persist — barely — metabolizing just enough to survive."

The implication is staggering — and not just because some of these single-celled organisms may have been alive for a hundred million years. Despite their similar appearances under a microscope, the genetic differences of these organisms are far more profound than any between humans and other visible forms of life on Earth.



PREVIOUS PAGE PHOTOGRAPHY: ISTOCK



THE LIFE BENEATH

On the surface, life displays dazzling diversity — from towering sequoias to luminous jellyfish, from scuttling ants to graceful giraffes. But even the most alien-looking organisms we can see are remarkably close cousins, evolutionarily speaking. "I look at my children and then at a jellyfish — clearly different species," Lloyd says. "But when we look at their DNA, we find that we only diverged from jellyfish a few hundred million years ago."

That may sound like a long time ago — but in evolutionary terms, it's a mere blink of an eye, particularly when compared to the timescale of subsurface microbes. They diverged from one another billions of years ago.

"There are 100 billion billion billion living microbial cells underlying all the world's oceans," Lloyd says. "That's 200 times more than the total biomass of humans on this planet. And those microbes have a fundamentally different relationship with time and energy than we do."

Another striking way that subsurface life forms differ from those on the surface of the planet — and from each other — lies in what they breathe.

"Most visible life on Earth either respires oxygen, ferments, or photosynthesizes — and that's it," says Lloyd. "But some species of subsurface life can 'breathe' every metal on the periodic table, including arsenic, while others breathe carbon dioxide. That's not something any visible life form can do."

To "breathe," in this context, means to harvest energy through redox reactions — chemical exchanges through which electrons are transferred. When those reactions are coupled to energy production inside the cell, it's called respiration. For microbes buried deep underground, oxygen often isn't even part of the equation.

Even more fascinating, metal-breathing microbes are not confined to one lineage. Just as diverse organisms on the surface have evolved to breathe oxygen, metal breathers appear on wildly different branches of the tree of life — a testament to life's adaptability and the evolutionary forces shaping it far beneath our feet.

"It makes perfect sense when you think about it," Lloyd says. "They've had 10 times more time to evolve in different directions. They've been down there, changing slowly, unnoticed, for nearly as long as Earth has had life.

"Now, the cutting-edge methods we are developing to study the subsurface have enabled us to discover that there are branches on the tree of life that we never knew existed until now — lineages of life that had gone undetected for billions of years," she says.

This realization reshapes our understanding of biology. It suggests that we've only scratched the surface — literally — of life on Earth.

PRACTICAL POTENTIAL

This extraordinary endurance isn't just biologically fascinating, it may have real-world applications. One of Lloyd's collaborators at USC Dornsife, Andrew Steen, associate professor of biological sciences and Earth sciences, is investigating whether protein-stabilizing microbes could help extend the shelf life of vaccines without refrigeration — a breakthrough that could revolutionize access to healthcare in parts of the world with limited resources.

Lloyd's trip to Costa Rica — which sits on a subduction zone — also helped solve a puzzle with implications for the climate: Why does carbon dioxide escape in massive plumes from the country's volcanoes, but only in tiny puffs from its hot springs?

Her team discovered that deep underground, microbes and rock reactions were converting the gas into carbonate minerals, locking it into rock before it reached the surface. That insight could inform carbon capture strategies. Instead of releasing CO_2 into the atmosphere, we could pipe it underground, where microbes would help turn it to stone. In some cases, with hydrogen present, microbes can even convert CO_2 into methane — creating a usable energy source, although with climate trade-offs.

From vaccine preservation and carbon capture to enzyme stabilization and insights into aging, Lloyd's research has far-reaching potential. But she's quick to point out that real-world benefits aren't her primary focus.

"I'm not looking for any particular solution or benefit," she says. "My goal is to push the boundaries of what we know to best provide for other people who *are* doing practical stuff. That's the promise of blue-sky research."

Still, her excitement about the possibilities is palpable. "If we can make such a big breakthrough from just one study, then imagine what else is waiting to be discovered down there?" Lloyd says. "This new field of geobiochemistry is going to have huge implications — maybe even predicting earthquakes or finding life beyond our planet."

It could even, she says, help us understand the origin of life itself.

"Life buried deep within the Earth's crust may seem irrelevant to our daily lives," she says. "But this weird, slow life may hold the answers to some of our planet's greatest mysteries — and challenges." D

PHOTOGRAPHY: COURTESY OF KAREN LLOYD

The Great Apes' Guide to Human Nature

In the great apes, an anthropologist finds compelling insights into humankind.

BY DANIEL P. SMITH



"We turn to the great apes to get an angle from a living creature into what our ancestors might have been like."

WHAT CAN CHIMPANZEES TEACH US ABOUT OURSELVES? A lot, says Craig Stanford, who's spent three decades studying the lives of our closest cousins.

Humans share upwards of 98% of their DNA with the great apes — gorillas, chimpanzees, bonobos and orangutans — and Stanford, a professor of biological sciences and anthropology, looks to the nonhuman primates for insights into human evolution and the origins of our behavior.

"People go to therapy to understand how their past influences their present and their future. I do something similar on a species scale," says Stanford, who arrived at USC Dornsife in 1992 at the invitation of the renowned primatologist Jane Goodall, Distinguished Emeritus Professor of Anthropology and Occupational Science at USC.

While careful not to position the great apes as "underevolved humans" — "They are their own species on their own evolutionary paths," Stanford says — he notes that by studying them, we gain insights into both our ancestors' lives and our own modern behavior.

"We turn to the great apes to get an angle from a living creature into what our ancestors might have been like, how they behaved and what they did with their lives — even simple things like how they moved," says Stanford, who is also a research associate at the Natural History Museum of Los Angeles County.

When Goodall first began publishing her work in the 1960s, the scientific establishment lambasted her for assigning chimps names like Fifi and Frodo. But chimps, as Goodall contended then and Stanford echoes today, have individual personas much as people do. Some are outgoing, trustworthy community members and innate leaders. Others are loners who prize status above all else.

"We recognize there's a basic template of their emotional and psychological state that is very similar to ours in many ways," Stanford says.

SOCIAL ANIMALS

Consider social bonds among chimps. Living in communities, chimps learn to navigate diverse and distinct social relationships across the multiple decades of their lives. A high-ranking chimp, for example, might use its power to support a lower-ranking chimp in limited ways, but it probably wouldn't throw its entire social capital behind a lower-tiered peer, something Stanford compares to the human political arena.

The social interactions of chimps provide a window into our lives, delivering insight into everything from the social hierarchies taking shape on the playground to the teamwork pushing corporate success to the altruism shaping philanthropic giving.

And what about the great apes' communication methods?

Little is known about early human communication because communication does not fossilize. But here again, the great apes offer us intriguing clues into a mysterious world. Bonobos, for instance, coordinate their vocal and gestural communication in ways similar to humans, a crucial component to their livelihood. PhD student Elizabeth Beachem, who is studying under Stanford, has spent her graduate years focusing exactly on this. These communication systems help the animals gain awareness of the world around them, make requests and send warnings.

"It's not as sophisticated as humans, obviously, but nevertheless something we would call a language," Stanford says.

OBSERVANT LEARNERS

Like people, the great apes also lean in to their acquired problem-solving skills throughout life.

Often by watching others, chimps learn to make tools. They use sticks to fish for termites and rocks to crack open hard-shelled nuts. Observation, innovation and adaptability ensure nourishment, of course, but also drive self-preservation and quality of life. It is much the same in modern society, where few invent anything new, but rather pivot and reshape past successes to fuel future progress.

The great apes learn to navigate complex physical environments as well, coming to understand their habitat like a seasoned forest ranger. Leveraging their spatial memory, chimps travel miles to find one huge fig tree in the month it's bearing fruit — or are at least smart enough to follow savvier chimps to the fig tree. It is another sign of the lifelong learning the great apes value, which then empowers calculated risk-taking and propels their overall well-being.

"When your survival relies on it, you must learn to adapt," Stanford says.

It's a lesson as true in the rainforests of Africa as it is in the boardrooms, classrooms and communities of modern human life. D

PHOTOGRAPHY: GETTY IMAGES/ PETR KOLB

the art of living

USC Dornsife writers, musicians and visual artists transform the raw material of life into creative works that illuminate, challenge and inspire.

BY MARGARET CRABLE



"Art is the proper task of life," wrote philosopher Friedrich Nietzsche, who believed that life's contradictions — beauty and brutality, joy and sorrow — acquire deeper meaning through creative expression.

That idea is exemplified by the work of six USC Dornsife-affiliated artists and writers, whose personal histories fuel their creative expression. One turns wildfire devastation into luminous paintings. Another sculpts memory from sugar, a third documents sacred rituals through the camera lens.

Across mediums and generations, each embodies a central truth of the humanities: Creativity isn't just a way to interpret life — it's a way to survive its challenges, celebrate its triumphs and understand its many mysteries.



THE ECLECTICIST

For Pulitzer Prize and National Book Award winner **Percival Everett**, writing novels is an excuse to indulge his avid curiosity. "I often become obsessed with a subject and then realize that a novel is brewing," he says. "I like discovery and, as I don't know much, the world is wide open to me. I like being confused."

That enthusiasm for variety, coupled with his humble approach, has shaped the unusually wide-ranging body of work by this Distinguished Professor of English. He's written a western, a murder mystery and a children's book. His novels have featured baseball players, Vietnam veterans, hydrologists and horse trainers. His most recent novel, *James* — which won the 2025 Pulitzer Prize for Fiction and the National Book Award in 2024 — is a retelling of Mark Twain's *Adventures of Huckleberry Finn.*

Everett is also a jazz guitarist, fly fisher and painter, with an exhibition of his artwork opening in Milan this June.

He and his wife, Danzy Senna, who is also a professor of English at USC Dornsife, were both finalists for the 2025 PEN/Faulkner Award — Everett for *James* and Senna for *Colored Television*. The couple are parents to two teens who are also skilled storytellers, prompting Everett to insist, with characteristic modesty, that he's "easily the least talented writer in our house."

THE DUALIST

Artist **Jessica Taylor Bellamy '14**, who majored in political science, describes her works as capturing "moments of awe and precariousness" — a duality she often finds in her hometown of Los Angeles, where beauty and instability live side by side.

The city feels as if it's in a permanent state of metamorphosis: Light shifts by the hour. Familiar sites give way to redevelopment. Wildfires reduce neighborhoods to ashes. "Each drive or walk becomes an act of witnessing transformation," she says.

Signifiers of these shifts — sunsets tinged with smoke, chain-link fences enclosing construction sites, palm trees on fire — appear frequently in her paintings and mixed-media work.

Bellamy is also drawn to the city's fading memories. She is the recipient of a 2025 Lightning Fund Award from Los Angeles Contemporary Exhibitions — a grant that will fund her new video series infusing L.A. history with elements of magical realism.

THE ALCHEMIST

For novelist **Deborah Harkness**, professor (teaching) of history, art imitates life — sometimes literally.

Her best-selling *All Souls* series of historical fantasy novels centers on Diana Bishop, a science historian whose latent magical powers reignite after she discovers an ancient manuscript. The story echoes Harkness' own experience: A scholar of the history of science and medicine, she was inspired to write fiction after reading a book she chanced upon at the airport in Puerto Vallarta, Mexico, that imagined magical creatures living among us.

Soon, Harkness began rising at 5:30 a.m. to write before teaching her classes. Her first novel, *A Discovery of Witches*, hit *The New York Times'* Best Sellers list in 2011. Five more best-selling novels followed, along with a popular television adaptation on which she served as an executive producer.

Harkness now has a large community of devoted fans invested in the adventures of Bishop and her scientist-vampire lover, Matthew Clairmont. The title of her latest installment, *The Falcon and the Rose*, was announced earlier this year.

Imagining what happens next for her characters keeps the ideas flowing.

"As long as the questions keep coming, the books will keep coming," she recently told *Elle* magazine.



PHOTOGRAPHY: JOHN DAVIS, WINDHAM-CAMPBELL PRIZES; CHAD UNGER; AUSTIN SANDHAUS



THE POLYMATH

Enrique Martínez Celaya, the first Provost Professor of Humanities and Arts at USC Dornsife, originally trained as a physicist. Today — in true Renaissance style — his work spans painting, sculpture, poetry and fiction.

This fall, Culver City's Wende Museum will feature his latest work: a sculptural recreation of his childhood home in Cuba, built from sugar. It's an homage to the country's staple crop and a nod to impermanence. "I rebuilt it as an act of resistance against time," says Martínez Celaya. "And by making it out of sugar, I acknowledged the fragility and ultimate futility of that resistance."

The work is titled *The Sextant*, after the sailor's navigational tool. For Martínez Celaya, the home his father built in Cuba has served a similar function: "Over 50 years after leaving our country of origin, the house is still guiding our journey as immigrants, shaping our understanding of our family and ourselves."



THE AMPLIFIER

Before he became Grammy-nominated musician **Aloe Blacc**, Egbert Nathaniel Dawkins III '01 majored in linguistics and psychology at USC Dornsife and communications at USC Annenberg School for Communication and Journalism. Even then, he saw music as a tool for social change — inspired in part by the civic engagement modeled by USC professors and programs.

Born in Southern California to Panamanian parents, Blacc grew up surrounded by salsa, merengue and calypso. He began writing hip-hop lyrics at age 9, played trumpet in grade school, and formed the underground rap group Emanon before penning the Trojan tailgate favorite "I Love USC" as a student.

After a corporate job layoff, Blacc pursued music full-time. His breakout hits, including "I Need a Dollar" and "The Man," earned international acclaim. Blacc's lyrics and vocal performance on "Wake Me Up," released by the late Swedish producer Avicii, helped the song achieve multiplatinum, chart-topping status.

Today, Blacc continues layering his lyrics with meaning to amplify civic and social engagement. His latest album, *Stand Together*, was produced in partnership with a philanthropic organization of the same name, with songs spotlighting ordinary people doing good work to uplift their communities.

"I hope it inspires my fellow artists to lend their talents to telling the important stories of real people doing real work to make our world a little bit better," he says.



"I hope it inspires my fellow artists to lend their talents to telling the important stories of real people doing real work to make our world a little bit better."

THE WITNESS

Since graduating in 2016, photographer and videographer **Christopher Scott Carpenter**, pictured here at a Holi festival in Uttar Pradesh, India, has crisscrossed the globe capturing humanity's unique traditions, celebrations and expressions of belief. His lens has documented a Navajo coming-of-age ceremony in the American Southwest, Vodou practitioners in Brooklyn, New York, and costumed revelers at the Venice Carnival in Italy and Día de los Muertos in Mexico City.

Carpenter's unusual dual degree — cognitive science from USC Dornsife and film and television production from the USC School of Cinematic Arts — provided the ideal foundation for his work. "Cognitive science explores human understanding — how we perceive the world and the narrative or social structures we employ to do so," he says. "I thought that was an excellent complement to film production."

The intersection of perception and storytelling inspired his latest project: a photo book documenting the modern religious revival happening across the United States. "In one of my cognitive science classes, we talked about 'great awakenings,' religious revivals that often occur around times of great social upheaval," he explains.

It's a pursuit with a personal connection for Carpenter, who was raised Mormon — a religion that arose during America's Second Great Awakening of the early 1800s. His new work extends beyond traditional beliefs. One stop on his tour? A UFO convention. D

PHOTOGRAPHY: KWAKU ALSTON; ZACH BELL; SHASHANK JAYAPRASAD

ALUMNI INSIGHT

Byte by Byte

Raised on a farm, **Kirk Stueve '03** learned early to value the stewardship of the Earth. Now he's combining his roots in farming with his USC Dornsife education to help shape a more sustainable future — one field (and dataset) at a time.

BY KATHARINE GAMMON



PHOTOGRAPHY: KATY ECKERMAN





"I have to be able to speak farmer

"I don't really have a career, and that's been my career," Kirk Stueve '03 says with a laugh. But the truth is more complex: The USC Dornsife alumnus has carved an unusual path that spans the digital realm of artificial intelligence, the people-focused world of consulting and the hands-on work of his family's Midwestern farm.

With a master's degree in environmental studies and geographic information science (GIS), Stueve works as a product scientist at a leading AI company where he develops remote sensing and artificial intelligence products for farmers. He also helps run his family's corn and soybean operation and mentors young scientists — cultivating crops, data and future leaders alike.

HIGH TECH, DEEP ROOTS

The family farm — "a classic northern Midwest farm, in the middle of nowhere" — has always been a touchstone in Stueve's life. The surrounding county has a population of about 3,000 people and its fertile soil — a gift from an ancient glacial lakebed — makes it one of the most productive and flattest places on Earth. "You can see for miles and miles," he says. "And there are a lot of fond memories there."

Stueve was driving tractors by age 5 and for a long time couldn't imagine a future beyond farming. "That way of life just gets etched into your mind," he says.

But in his 20s, Stueve felt ready for a bigger challenge. After earning an undergraduate degree in biology, he was accepted to USC Dornsife's master's degree program in environmental studies and GIS — a unique blend of environmental science, policy and geospatial data analysis. The chance to move to Los Angeles and experience life beyond the farm added to the appeal.

While Stueve missed the Midwest's changing seasons, he found inspiration in his studies. "They were a really cool blend of science, technology and policy, all centered on sustainability," he says. "USC Dornsife was the obvious choice, and it's still paying off in ways that I never expected." That includes helping him integrate different strands of learning, enabling him to nimbly pivot among his diverse roles — professor, mentor, scientist and farmer.

FARMING THE FUTURE

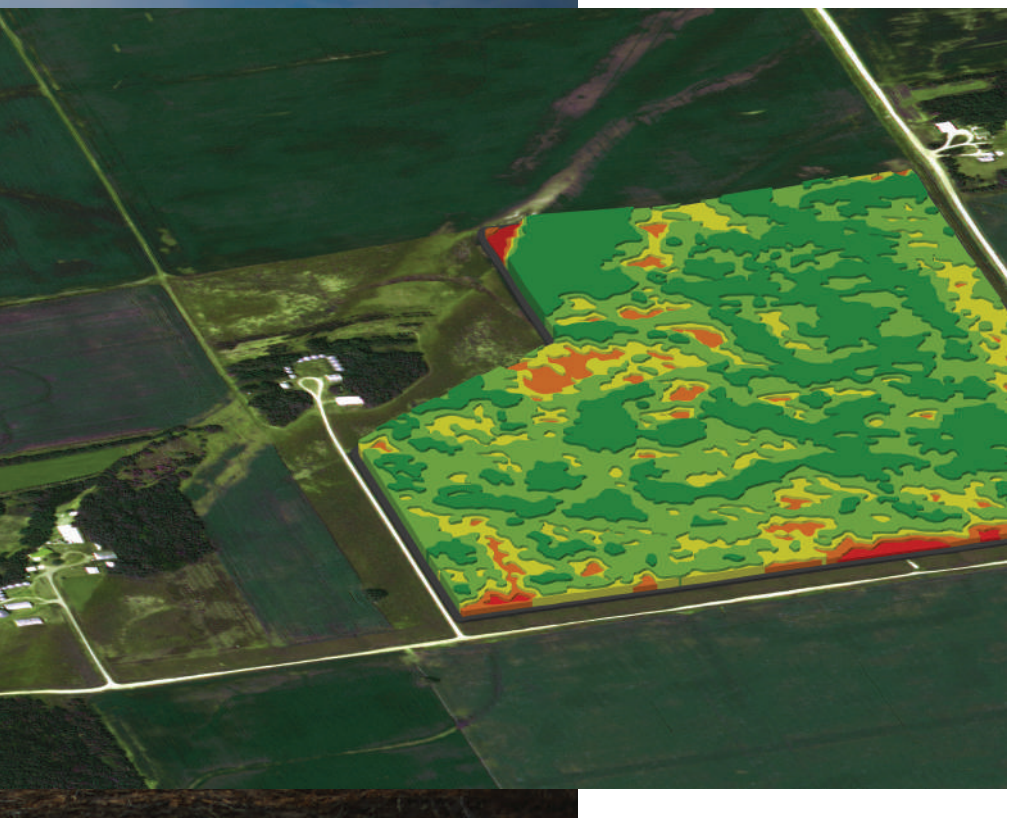
These days, Stueve works as a product scientist and consultant at Ceres AI. The Oakland, California-based agricultural technology company leverages AI and image recognition technology to help acquire, manage and insure farmlands while reducing environmental harm and increasing profits. The role is a great fit for Stueve's rare blend of on-the-ground agricultural knowledge and tech savvy. It also allows him to return home for two to three weeks each spring and fall to plant and harvest crops on his family farm.

"I'm a little bit of an anomaly there," he admits with a laugh. Straddling both worlds isn't always seamless, but it's given him a rare perspective — one foot in the cornfield, the other in the cloud.

Since sustainability is now baked into the goals of companies ranging from start-ups to multinationals, Stueve uses his expertise to help meet those ambitions. He says there's still a shortage of people who truly understand sustainability, economics, environmental science and cutting-edge technology like AI — let alone how to connect the dots between them.

"There's an urgent need, now more than ever, to find people who can bridge those divides," he says.

That bridge now extends to the next generation. Stueve has taught GIS, remote sensing and agroecology at a number of institutions, among them Saint Paul College and Johns Hopkins University. This year, he joined the USC Dornsife Mentorship Program,



and speak science."

where he is helping students find meaningful ways to help solve global environmental challenges.

Stueve's mentee, global geodesign major Shivi Anan, says he's opened her eyes to emerging career paths in geospatial technology and provided hands-on learning opportunities that have shaped her academic and professional aspirations.

"Thanks to Kirk, I've discovered a new application of geospatial technology that could be a promising career path for me," she says.

CULTIVATING CROPS AND CODE

Stueve's use of AI and precision technologies is helping make agriculture more environmentally friendly while boosting yields. His passion for land stewardship runs deep, shaped by a lifetime on the family farm where sustainability was a daily practice, not just a goal.

The developed world is not doing a very good job of growing food sustainably, he says. "The quickest way to propel us in the right direction is to leverage the latest science and technology to grow and do more with less. The latest advances in these fields have given us an unprecedented opportunity to change the world in a positive way that I don't think anybody thought was possible even five years ago."

One part of the solution, Stueve explains, involves using technology to identify the most productive areas for farming. This helps reduce pressure on environmentally sensitive lands — including those that provide habitat or clean water, or are vulnerable to wind erosion, runoff and other damage that can pollute waterways and threaten downstream ecosystems.

As part of this effort, Stueve collaborates with the University of Minnesota's Precision Agriculture Center to secure joint research grants and conduct farm-scale research trials. While most agricultural research relies on small test plots — often just 50 or 100 feet long — Stueve's work spans full-scale fields, sometimes hundreds of acres. He and his partners use Ceres AI thermal imaging from planes and remote sensing from satellites to test sustainable practices at scale, with the goal of reducing costs, boosting yields and minimizing environmental harm.

PRESERVING THE PAST

Stueve's commitment to his community runs deeper than soil — it's rooted in heritage. In the rural Midwest where his family owns land, small farms are increasingly being bought up by large conglomerates, erasing not just homes but histories. "I can think of seven, eight, nine different families within a few miles of the farm where I grew up that are no longer there," he says. "The houses are gone — in some cases, totally demolished."

So, when Stueve and his wife had an opportunity to buy a historic 1895 dairy farm in Chisago County, Minnesota — just across the state border from their home, a 140-acre farm outside Somerset, Wisconsin — they jumped at the chance. Though the buildings were in disrepair, the couple restored them and leased out the house and surrounding 17 acres, preserving both a piece of local history and a way of life.

TALKING DIRT AND DATA

Stueve deftly bridges the divide between science and agriculture — whether he's swapping stories over a beer with a local farmer or is deep in discussion with tech executives. "I have to be able to speak farmer and speak science," he says.

Despite practicing both "dialects" for years, it's not always easy. "Some farmers think I'm crazy," he says. "But they say that in a nice way because they're Midwestern." Still, he welcomes the challenge. "It keeps me excited to this day, just trying to straddle that divide." D

ALUMNI NEWS

1960s

Thomas Barrack Jr. (BA, political science, ’69) was confirmed as the new U.S. ambassador to Turkey.

1970s

John Miles (BA, history, ’77) retired as a lieutenant colonel after 31 years in the U.S. Army, National Guard and Army Reserve, having served in Vietnam and the Gulf War.

John Richardson (BA, interdisciplinary studies: drama, literature, ’77) wrote an article for *Esquire* that later inspired the film *Sing Sing*, nominated for three Oscars in 2025.

1980s

Colin Coulson-Thomas (MA, international relations, ’82) received an education award from the Bharat Bhagyavidhata Mahatma Gandhi Foundation at the House of Lords in London for over 30 years of service in education and health care.

Richard Downie (MA, international relations, ’83; PhD, international relations, ’95) was named president and CEO of the Los Angeles World Affairs Council & Town Hall.

Fernando Guerra (BA, political science, ’80) was honored by Los Angeles County Supervisor and Chair Pro Tem Hilda Solis for his 40 years of service to education, political scholarship and the Latino community at Loyola Marymount University.

Paul Krekorian (BA, political science, ’81) retired as president of the Los Angeles City Council. During his tenure, he spearheaded the city’s goal to transition to 100% renewable energy.

Ellen Mulholland (BA, English, ’85; BA, journalism ’85) retired from teaching after 34 years to pursue a writing career. She recently signed with Howland Literary Agency.

1990s

Jennifer Bransfield (BA, political science, ’96) was named one of the top 28 executives selected for the 2025 Daniel Burnham Fellowship by Leadership Greater Chicago. She is CEO and general counsel of Chicago Neighborhood Initiatives.

Christina Mardsen (BA, history, ’94) has been appointed a UCLA scholar-in-residence in the Race in the Global Past through Native Lenses program, which is supported by a Mellon Grant.

Arthur Ochoa (BA, history, ’90) was appointed co-chair of the Pacific Council on International Policy board of directors, advancing diverse perspectives on global affairs in California.

Karen Zarsadiaz (BA, history, ’94) was promoted to director of communications for the Los Angeles County Department of Mental Health.

2000s

Nicole Asao (BA, political science, ’06) was highlighted in the Women We Admire’s list of the Top 50 Women Chief Revenue Officers of 2024.

Tammy Bruce (BA, political science, ’02) was named spokesperson for the U.S. Department of State.

Kizziah Burton (MPW, ’09) won the $20,000 Montreal International Poetry Prize for her poem “Portrait of Me Incensing the Mushrooms Channelling Demeter.”

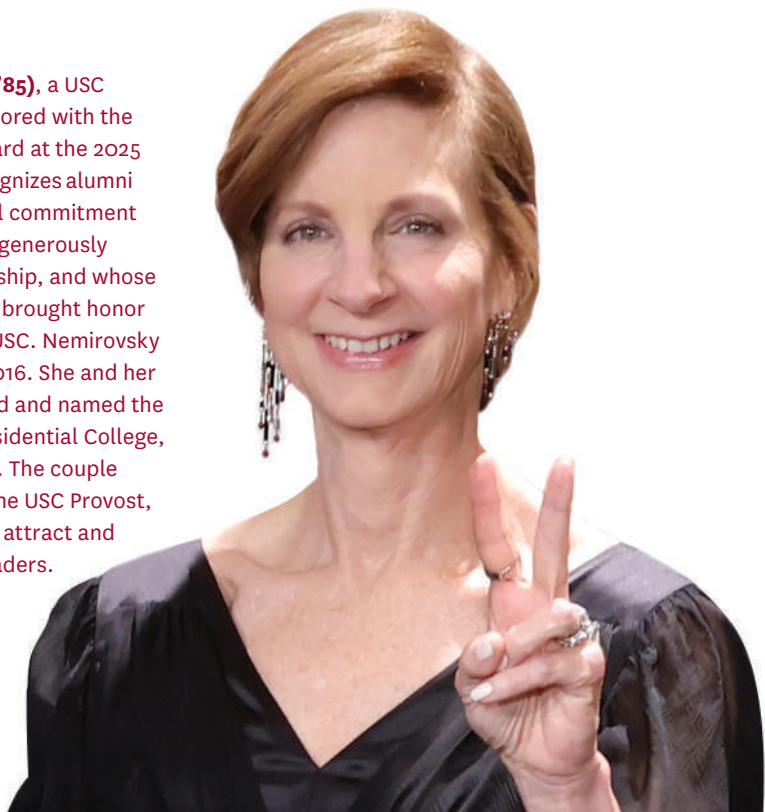
Jordan Carr (BA, German, ’08) competed on an episode of *Jeopardy!* on Dec. 17, 2024.

Price Karr (BA, international relations, ’08) was promoted to senior vice president of investor relations at Wynn Resorts.

Alison Morales Kerr (BS, environmental studies (biology), ’08) was promoted to senior director of community health at the Florida Department of Health. She also received the Boston Congress of Public Health’s 2024 40 under 40 Public Health Catalyst Award.

Heidy Vaquerano (BA, political science, ’04) an entertainment and sports law partner at Fox Rothschild, was named one of L.A. Business First’s 2024 Women of Influence.

Shelly Nemirovsky (BA, English, ’85), a USC Trustee and philanthropist, was honored with the Asa V. Call Alumni Achievement Award at the 2025 USC Alumni Awards. The award recognizes alumni who have demonstrated exceptional commitment to the university and community by generously giving their time, energy and leadership, and whose outstanding accomplishments have brought honor and recognition to themselves and USC. Nemirovsky has served as a USC trustee since 2016. She and her husband, Ofer Nemirovsky, endowed and named the new Shelly and Ofer Nemirovsky Residential College, which opened at USC Village in 2017. The couple also created an endowed chair for the USC Provost, ensuring the university continues to attract and support accomplished academic leaders.



$15M Gift Fuels Sustainable Energy Research

Massoud Arvanaghi (PhD, chemistry, '82) and his wife, Ferial Arvanaghi, have donated $15 million to the USC Loker Hydrocarbon Research Institute at USC Dornsife. The institute pioneers new chemistry-based approaches to mitigate global warming.

The gift will greatly expand the institute's ability to develop sustainable energy storage solutions by establishing three endowed funds supporting graduate students and postdoctoral fellows. Massoud Arvanaghi conducted research at the institute as a PhD student and postdoctoral fellow.

The donation honors USC Dornsife researchers Surya Prakash and the late George Olah, winner of the 1994 Nobel Prize in Chemistry, who were instrumental in Arvanaghi's journey after immigrating from Iran in 1978 to pursue his doctorate.

The Arvanaghis married in 1993 and soon purchased the small food company where Massoud worked, transforming it into a multimillion-dollar business before selling it in 2016.

"I came here as a graduate student with nothing," says Arvanaghi, crediting Olah and Prakash for helping him adjust, find work, and navigate visa and residency challenges.

"I'm really trying to give something back," he says, " a thank you to everyone at USC who gave me the opportunity."



2010s

Christina Biffle (BA, sociology, '12) received the 2024 Humanitarian Award from the Canopy Housing Foundation for her relief efforts in western North Carolina following Hurricane Helene.

Melvin Dilanchian (BA, English, '17; MA, strategic public relations, '21) and **Lena Tavitian (BA, economics, '19)** co-founded Project Yeraz, a career and leadership accelerator supporting L.A.'s Armenian community.

Leena Ibrahim (PhD, neuroscience, '16) was honored as a laureate in the L'Oréal-UNESCO for Women in Science Middle East Regional Young Talents program for her groundbreaking neuroscience research.

Andrew Kozlovski (BA, international relations, '18) co-created Drafted, a hiring platform that uses AI matching to connect job seekers and employers.

Aaliyah Qureishi (BA, psychology, '18) appeared in season 2 of the Amazon Prime Video series *Bandish Bandits*.

2020s

Eleanor Jiwon Kim (BA, narrative studies, '21) graduated from the University of Denver Sturm College of Law, passed the Colorado bar exam and is completing a clerkship at the Colorado Supreme Court.



Ego Nwodim (BA, biological sciences, '10) was honored with an Alumni Merit Award from the USC Alumni Association. The awards celebrate individuals whose remarkable professional or personal accomplishments have brought recognition to themselves and the university. A comedian, writer and producer, Nwodim, who is best known as a long-standing cast member on *Saturday Night Live*, gave the USC Dornsife commencement speech in 2022.

Have a professional achievement to share?

Scan below for your chance to win a $50 USC Bookstore gift card.

Are you a member of a multigenerational Trojan Family? Scan below to get in touch.

NEMIROVSKY AND NWODIM PHOTO BY GREG GRUDT; ARVANAGHI PHOTO COURTESY OF MASSOUD ARVANAGHI



PATHWAYS

Kate in Paris and London

KATE MCCUTCHEN '04 CREDITS HER FRENCH DEGREE WITH ENABLING HER TO FORGE A GLAMOROUS INTERNATIONAL CAREER, WORKING FOR A-LIST COMPANIES WHILE LIVING IN PARIS AND LONDON. **BY SUSAN BELL**



Raised in small-town Texas, Kate McCutchen's first overseas trip — to Paris at age 15 — sparked a passion for international life. Two years later, she left the Lone Star State and set out on a journey that would take her to Paris and London, building a global career with major tech, finance and luxury retail brands.

"None of this would have happened if I hadn't done my B.A. in French at USC Dornsife," she says. "It's a priceless asset that's provided the foundation for my entire career."

Describing herself as "an accidental French major," McCutchen says she switched majors several times before realizing her love for France was at the heart of what she wanted to pursue.The payoff? Huge. "My business French class was one of the most valuable classes I ever took. I still use what I learned in that class to this day," she says.



After graduating, McCutchen's love of travel and all things French led her to take a job with Air France as a check-in agent at Washington-Dulles International Airport. A year later, she took the plunge and moved to Paris to earn an MBA at the prestigious international business school HEC — and never looked back.



ILLUSTRATIONS: CARMEN SEGOVIA



A Paris internship with Apple led to a role at the company's European headquarters in London, where she shared a flat in a converted church. She later joined Samsung for two years, then relocated to Luxembourg to work for Amazon.



She held senior roles at Amazon Media Group and mobile payment company Square in the United Kingdom, later leading European operations for luxury luggage brand Away. In 2022, she became chief marketing officer of private investing startup Seedrs before taking on her current role leading international marketing at location-sharing app Life360.



McCutchen now commutes to London two days a week from the bucolic Yorkshire town where she lives with her British husband (they met — of course — in a pub) and their beloved Basset Hound, Brisket.

Acknowledging that her life story has "all the beats of a good rom-com," McCutchen says, "If you plotted a movie about my fabulous career, a French degree might seem like an unlikely starting point. But I wouldn't be where I am today if I hadn't majored in French at USC Dornsife."



CREATIVE WRITING CONTEST

make room

BY SHANDELA CONTRERAS

when i moved / from my parents' house / to my own / I took selena / the movie / a dvd / with jlo's face / the bean bag / my cousins laughter / still lingering in the fabric / the one they'd claim as their own / with no blankets left to share / i took the tilapia / red snappers / fresh from the sea / though i had no refrigerator / yet to keep them cold / i took the bicycle / i bought in / topanga canyon / with its blue lights / wrapped around / each wheel / but it's never felt the kiss / of pavement / never seen the darkness / of the streets / never caught the light / of day / it hasn't even touched / the ground / beyond / the gravel beside the lot / where it was born / you don't need it / my parents tell me / but I have / to carry / these things / with me / everywhere I go / the memories folded in / the weight of them a comfort / and you can / it can't be discarded / won't be left behind / write them into the depths / of poem / you do that / right? / and give them / to someone else / so they may find / comfort in the borrowed / they'll find / they were never alone / that what we carry is never lost / but passed along / even time / even words / our parents breath / and everything / worth / having gains / when given / when we make / room / for more always comes.

Scan to hear Shandela Contreras read her winning poem.



ABOUT THE WINNER

A South Los Angeles native, **Shandela Contreras** is a senior studying creative writing at USC Dornsife and occupational science at USC Chan Division of Occupational Science and Occupational Therapy. She started writing poetry in third grade and is a graduate of USC's Leslie and William McMorrow Neighborhood Academic Initiative, a rigorous college access and success program.

Her poem was inspired by the recent Los Angeles wildfires, which destroyed the homes of several close friends.

"It was born out of my meditation on the fires, which took so much from this beautiful city and its people," she says. "I reflected on the fact that, in life, there is always more to come. More could be anything: more joy, more kindness, more to give to others — more purpose. In this poem, I wanted to offer that possibility, that hope."

A POWERFUL VOICE

As a California Youth Poet Laureate Ambassador, Contreras has performed at venues such as Sacramento's California Volunteers College Corps launch with California Gov. Gavin Newsom, Los Angeles Master Chorale's "I Believe" concert in Walt Disney Concert Hall, New York City's Lincoln Center, and Paris' 2024 Cultural Olympiad Sport + Poetry Games where she was a Los Angeles poet delegate.

AUTHOR

Contreras is the author of the chapbook *Mellow Ballads, that move your bones* (2021) and the collection *Every Beautiful Pen Bleeds Through* (2024).

WHAT'S NEXT?

Following graduation, Contreras plans to pursue careers in the publishing industry and as an author while finishing a master's degree in literary editing and publishing at USC Dornsife.

FROM THE JUDGES

"With her poem 'make room,' Shandela Contreras explores not only the depths of memory but also the depths of creative expression, which often draw from the same deep well. In just a few spare lines, she delineates the longing inherent in growing up, and the ache of what we keep and what we leave behind."

DAVID ULIN, PROFESSOR OF THE PRACTICE OF ENGLISH

ENTER THE NEXT CREATIVE WRITING CONTEST

Get inspired by the theme of our next issue — "Family" — and submit your entry by **Sept. 15** to win a chance to have your creative writing published in *USC Dornsife Magazine*. Open to alumni and students of USC Dornsife, the contest is judged by Dana Johnson, chair of English and Florence R. Scott Professor of English; David Ulin, professor of the practice of English and editor of USC Dornsife's literary magazine *Air/Light*; and Susan Bell, editor-in-chief of *USC Dornsife Magazine*.

The recipient of more than 45 awards for excellence, the magazine is distributed to over 80,000 alumni, faculty, staff, parents and friends of USC Dornsife.

SCAN BELOW FOR DETAILS

PHOTOGRAPHY: MAYARI STUDIO

56 what if ... ?

Aqueducts Could Power and Preserve California

CALIFORNIA HAS A 4,000-MILE NETWORK OF AQUEDUCTS THAT TRANSPORT WATER THROUGHOUT THE STATE. WHAT IF THAT SYSTEM COULD BE ADAPTED TO CONSERVE THE WATER THAT RUNS THROUGH IT AND GENERATE RENEWABLE ENERGY TO MEET THE STATE'S GROWING DEMAND FOR POWER? USC DORNSIFE IS AT THE FOREFRONT OF AN INITIATIVE TO DO JUST THAT.



THE CHALLENGE

As climate change intensifies, California faces more frequent and severe droughts, while also striving to meet its ambitious goal of achieving 100% clean energy by 2030. With much of the state's water transported through open-air aqueducts, evaporation claims an estimated 63 billion gallons annually — water that could otherwise support communities, ecosystems and agriculture.

At the same time, the transition to renewable energy requires innovative solutions that don't compete for land needed for housing, farming and conservation.

THE VISION

USC Dornsife's Public Exchange (PX) is leading the California Solar Canal Initiative (CSCI), a collaborative effort to explore how covering aqueducts with solar panels could help solve two major challenges at once: reducing water loss from evaporation while generating clean energy.

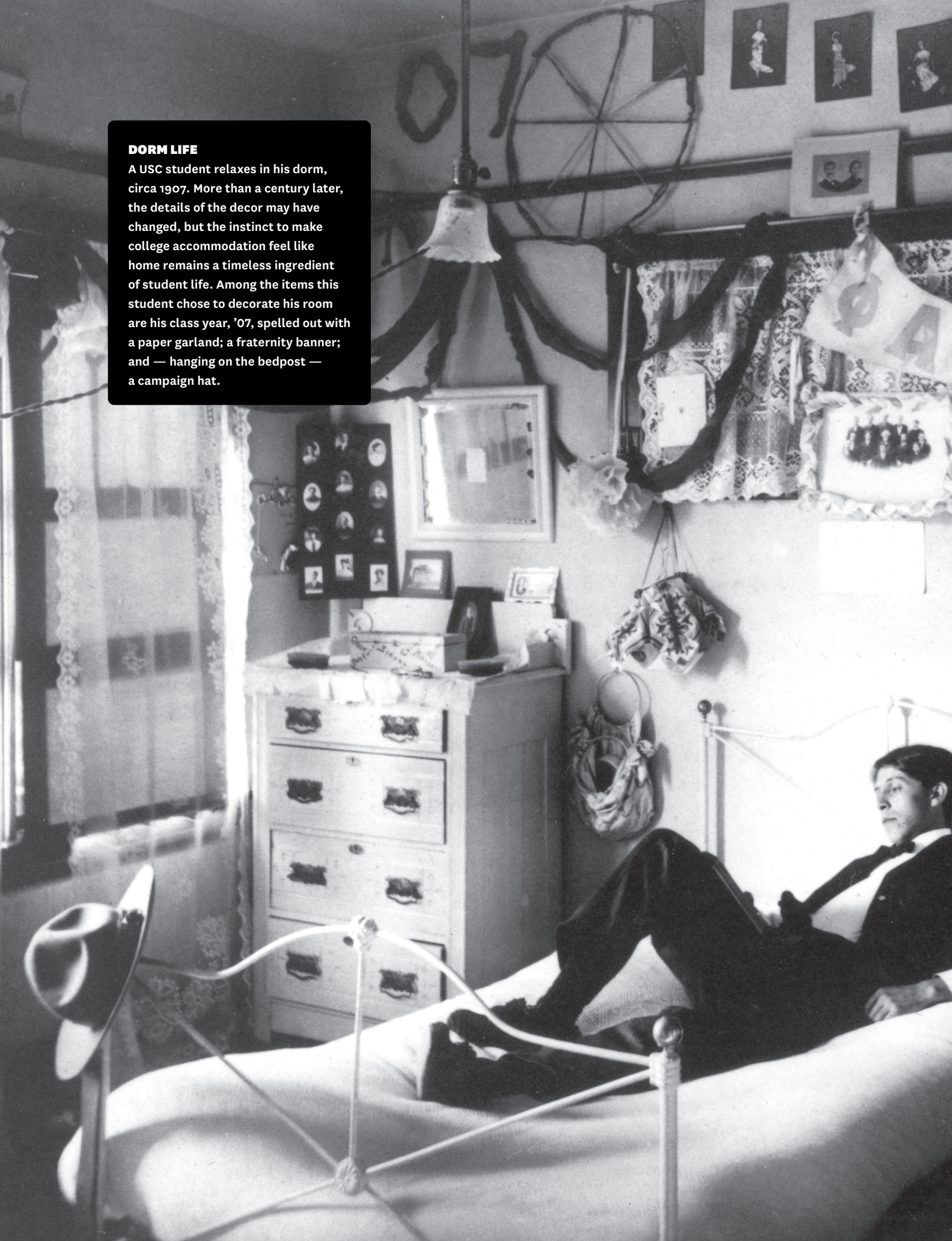
Bringing together experts from seven universities, nonprofits, government agencies and the private company Solar AquaGrid, the initiative is developing the strategies and decision-making tools needed to make large-scale implementation possible. By tackling policy, economic and environmental hurdles, CSCI is laying the groundwork for a future where California's aqueducts don't just deliver water — they help power the state.

THE IMPACT

Covering California's aqueducts with solar panels could conserve enough water to irrigate 50,000 acres of farmland while generating clean energy to power up to 10 million homes.

With a pilot project now underway in the Central Valley, PX's leadership is helping transform this vision into reality. If successful, other regions could replicate this model, setting a new standard for sustainable infrastructure and marking a pivotal step in the fight against climate change.

IMAGE: COURTESY OF SOLAR AQUAGRID; HISTORIC PHOTO COURTESY USC DIGITAL LIBRARY, UNIVERSITY ARCHIVES COLLECTION



DORM LIFE

A USC student relaxes in his dorm, circa 1907. More than a century later, the details of the decor may have changed, but the instinct to make college accommodation feel like home remains a timeless ingredient of student life. Among the items this student chose to decorate his room are his class year, '07, spelled out with a paper garland; a fraternity banner; and — hanging on the bedpost — a campaign hat.

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Point / Counterpoint
Immortality: Promise or Peril? Scholars debate.
Page 16

Bang! Goes The Universe
From solving cosmic puzzles to exploring cosmogenic myths, how humans explain life's origins.
Page 20

Kiss of Life
By combating Earth's greatest threats, researchers offer new hope to the fragile systems sustaining us all.
Page 24

What's the Point?
Philosophers tackle life's biggest question.
Page 30

Buried Alive
The deep Earth is teeming with weird, secret life we never imagined existed.
Page 36