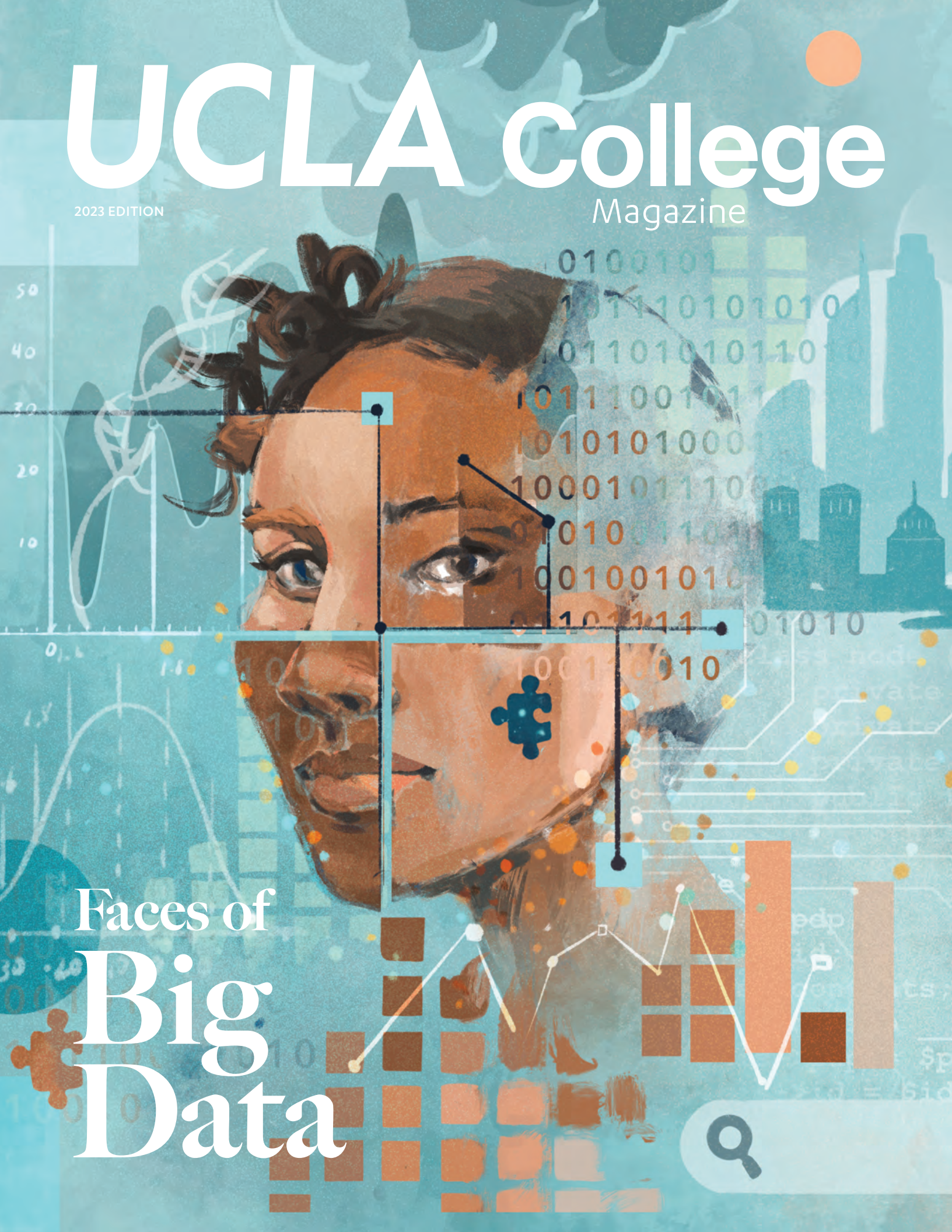


UCLA College

2023 EDITION

Magazine

Faces of Big Data





REED HUTCHINSON | GARCÍA-GARIBAY: ALYSSA BIERCE

A GLOBAL COMMUNITY

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As the world grows increasingly interconnected—socially, technologically, culturally, environmentally—the UCLA College remains a vital hub for cutting-edge research, education and service, as the following pages attest.

Our features in this issue showcase this Bruin-focused interconnection. They highlight how the visionary, interdisciplinary UCLA College community unites around challenges and opportunities to push knowledge forward, including navigating the era of big data with true equity and innovation, exploring the countless ways to study and fight viruses, and achieving far-reaching outcomes with the entire globe as a UCLA classroom.

We also welcome two distinguished new voices to the College's leadership team: Alexandra Minna Stern, dean of humanities, and Abel Valenzuela, interim dean of social sciences. In their brief tenure thus far, they have already proved to be phenomenal leaders, and we deeply look forward to this next chapter in the College's remarkable history.

Enjoy this issue and please consider connecting further with the College—your story is ours!

As a land grant institution, UCLA acknowledges the Gabrielino/Tongva peoples as the traditional land caretakers of Tovaangar (Los Angeles basin, So. Channel Islands).

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**"STUDYING ABROAD IN SPAIN WAS A
TURNING POINT—I AM PURSUING A
SECOND MAJOR IN SPANISH INSTEAD
OF ONLY A MINOR BECAUSE THIS
UCLA PROGRAM INSPIRED ME."**

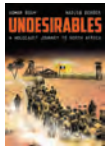
—MIA CONTI, CLASS OF 2023

HAVE CURIOSITY, WILL TRAVEL

All around the world, UCLA College students are living, studying and interning abroad—and learning to make a difference. See the globe through their eyes on page 21, at bit.ly/thinkingglobally and in this study abroad photo contest-winning image of a Granada sunset taken by environmental science major Mia Conti, class of 2023.



READING LIST



Undesirables: A Holocaust Journey to North Africa
by Aomar Boum and Nadjib Berber



What Sorrows Labour in My Parent's Breast? A History of the Enslaved Black Family
by Brenda E. Stevenson



UCLA's 2023 Guggenheim Fellows include **Michael Berry**, professor of contemporary Chinese cultural studies; **Prineha Narang**, Howard Reiss Professor of Physical Sciences; **Alex Purves**, professor and chair of classics; and **Michael Rothberg**, professor of English and professor and chair of comparative literature.

'TED' TALK

Courtney Chapman '22, who earned a B.A. in English, started her business in 2019 through TikTok. From jewelry to this one-of-a-kind *Ted Lasso* figurine, her work is inspired by pop culture characters close to her heart. Read more on page 17.



Miguel García-Garibay, senior dean of the UCLA College and dean of physical sciences, and **Min Zhou**, the Walter and Shirley Wang Professor of U.S./China Relations and Communications, were inducted into the **National Academy of Sciences**.

“Using the powers of the best that is in each of us ... not only can we be transformed, but we can transform.”

—REV. JAMES LAWSON

Civil rights icon and lecturer in the labor studies program at UCLA

The UCLA Labor Center will launch a fundraising effort this year dedicated to labor research, teaching and service for decades to come. UCLA recently named the labor center building in downtown Los Angeles after **Rev. James Lawson** to honor his commitment to racial, immigrant and worker justice.



After using various ursine monikers, UCLA eventually settled on Bruins in 1926. In this spirit, look for variations of the Bruin bear represented in the artwork in each of the three features in this issue.



COSMIC IMPACT



The UCLA Space Physics and Planetary Sciences, Applications, Communication and Engineering (SPACE) Institute held the inaugural SPACE Economy Forecast in May, a collaboration between the UCLA Division of Physical Sciences and the UCLA Anderson Forecast. Watch this vital glimpse into the industry's trillion-dollar future: bit.ly/SEFUCLA

LET'S TALK
SCIENCE

THE FUTURE OF REPRODUCTIVE HEALTH

As part of its ongoing “Let’s Talk Science” series, UCLA Life Sciences hosted an event with leaders of UCLA’s new Center for Reproductive Science, Health and Education. Meet the center’s new director, **Amander Clark**, on page 10, and watch the webinar at bit.ly/crshevideo

➔ To explore these and other stories in the *UCLA College Magazine* online, please visit college.ucla.edu/magazine

MORE THAN WORDS

**HELPING STUDENTS REALIZE
THEIR FULL POTENTIAL
LEVELED UP HER OWN**

San Francisco native Kate Green is the rare college student who relishes writing academic papers.

"I love citations," she admits.

When there's nary a footnote to format, however, she is happiest exploring magazine-style journalism—especially as editor-in-chief of UCLA's chapter of *Her Campus*, a national online student publication that focuses on college women's lives, stories, interests and issues.

"Writing is agency. It allows people to get their ideas out there, and it's democratic—anyone can learn, and with the internet it's easier than ever

to share," Green says. "I'm especially interested in seeing how Gen Z women interact with my writing."

Always sure that she would be an English major, Green was in her second year at UCLA when she added a community engagement and social change minor due to her interest in nonprofit work and advocacy. She deepened her involvement with both her major and her minor when she accepted a role as a UCLA Library peer research and writing specialist for the cluster course "Evolution of Cosmos and Life."

(Specialists like Green have completed a cluster course—a yearlong, collaboratively taught, interdisciplinary learning community available to entering freshmen only—and are hired to serve as advisors and assistants to first-years in the program.)

Green was inspired to take the role due to her own transformative clusters experience.

"I've never been very good at science, so it was amazing to see I could finish all my science requirements just by completing the cluster program," Green says. "What surprised me is how accessible they made the science and how much I loved it. I was no longer afraid of it."

As a student during the pandemic, Green completed her own cluster courses virtually, which led to one of her favorite Bruin learning experiences.

"During an astronomy unit, they had us go for a walk every night in our neighborhoods, wherever we were living at the time, and draw diagrams of the moon so we could track its progress and phases," she recalls. "I looked forward to it every night, walking with my mom and my little notepad, drawing the moon. It got me out of the house during a very dark time."

A lover of Jane Austen, taekwondo and vegan cooking, Green is considering working with a children's literacy nonprofit after graduation, but as she closes out her junior year, she's focusing on the cluster students she supports.

"I was worried they wouldn't reach out to me, since I'm not the professor, but I've already been getting emails and office-hour visits," she says. "They want to have movie nights and all these fun activities—they're really excited about the cluster program. That makes me proud, because I felt like I owed something to this great program, and I'm glad I can give back." [U](#)



LEADING AND LEARNING

SHE'S GUIDING FIRST-YEAR STUDENTS WHILE BLAZING TRAILS

It would be hard to top Makena Tinney's most memorable UCLA moment.

"All of us students got to handle actual human donor brains," she says. "It was really cool to see and hold this small thing—not more than three pounds—that's in charge of everything we think and feel."

Fittingly, this powerful lesson occurred in "All in Your Head? Brain, Bodymind and Society"—one of UCLA's yearlong, collaboratively taught freshman cluster courses that build community and curiosity while helping new students get off on the right foot. Tinney, an alumna of a previous cluster course in biotechnology, participated again her second, third and fourth years by supporting the program's students as a peer research and writing specialist through UCLA Library.

"I'm a first-generation Latinx student who didn't know much about college, so I wanted to be there for anyone who might be feeling lost or overwhelmed," Tinney says. "I'm proud to be a voice for students, to guide them to resources and to give them good strategies for success. I can tell them from experience, 'I did it. So can you.'"

A psychology major, Tinney was drawn to her field out of a desire to find the language for what makes us human—everything from how the brain works when we perceive color to what it's like to have a loved one with a serious mental illness. Her dream is to work in the court system as a forensic psychologist.

"This combines the two great goals of my life: to protect those who cannot protect themselves and to understand the criminal brain," says the true-crime junkie, who jokes that she's been watching *48 Hours* since



birth. "I am passionate about reforming law enforcement and the prison system and inspired by the inclusive, innovative directions the field of psychology is going."

When it comes to being a compassionate, nurturing Bruin—reflected also in her "tiny jungle" of dorm houseplants—Tinney has a deeply cherished role model.

"My grandfather used to work at UCLA as a student rep. Today, when we talk about campus, he'll tell me he's the reason we have Lucky Charms in the dining halls, because

he did a survey asking students what cereal they most wanted," she says. "Getting reduced fees as an employee was the only way he was able to take a few courses here. So it makes me extremely proud to go to UCLA and carry on his dream."

She hopes to spark this same feeling of pride in the younger students she counsels, and to make them feel at home.

"Something I like to say a lot is, 'You deserve to be here,'" Tinney says. "UCLA belongs to all of us." 



CHANGING THE NARRATIVE

BY MEETING CHALLENGES WITH CREATIVITY, SHE'S WRITING A BRIGHTER FUTURE FOR ALL

Doctoral candidate Jessica Lee always knew she belonged at UCLA—even if she had to chart a path here on her own terms.

"It was—and still is—my dream school, and I was gutted when I didn't get in for undergrad," she says. Undaunted, after transferring from Santa Monica College and graduating from UC Irvine, she reapplied at the master's level: "I told myself, if I get in I'm going to meet as many people as possible, take transdisciplinary courses across campus and be uninhibited in my search for community."

Realizing her dream, Lee earned two master's degrees from UCLA, one in African American studies and the other in English, and is now completing her doctorate in

English as one of UCLA's two UC President's Pre-Professoriate Fellows for 2022–23. The self-described bibliophile also received UCLA's Carolyn See Graduate Fellowship in Southern California & Los Angeles Literature in support of her work on groundbreaking science fiction author Octavia E. Butler.

Drawing on four novels by trailblazing Black women—Butler, Paule Marshall, Toni Morrison and Gloria Naylor—Lee explores Black women's lives on and off the page through the lens of the Black Atlantic by reimagining transatlantic slavery, principally the Middle Passage, in unearthing places of belonging, origin spaces and diasporic mobility, both physical and otherwise.

"African Americans or Black people occupy this limbo state. Even if unable to locate tangible, geographical sites of freedom, there's a type of psychic experiential and experimental freedom accessible when you're able to imagine other worlds," she says. "I can see myself in all of these novels' protagonists, and I'm sure there's a plethora of other individuals who can, too."

This vision to author her own story—and to help others do the same—inspires Lee's service as a peer mentor in the UCLA Center for Community College Partnerships, which helped pave her path to the UC system years ago. It also drives her work at a local community college, where as an adjunct faculty member she prepares her students to find their way to world-class institutions like UCLA—and to confidently chart their own course while uplifting others once they arrive.

Looking ahead, Lee is excited by the positions and possibilities awaiting her, whether she'll continue to expand the research and scholarship of the academy or pen a completely new chapter at the intersections of her biggest passions—fashion, travel, film and food—perhaps as editor-in-chief of a Condé Nast publication.

"I think scholars can do it all and have multiple interests," she says. "We can become educators, researchers and authors, but we can also push parameters. The skills that academia equips us with are limitless assets, and it's those possibilities that are most worth tapping into." [U](#)

RHYME AND REASON

IN THE POETICS OF HIP HOP, HE FINDS A CATALYST FOR SOCIAL CHANGE

Adam Bradley wouldn't be a professor or a writer, he says, were it not for his grandmother.

In elementary school, Bradley was very nearly held back when a teacher thought he wasn't learning to read quickly enough. "They told my family, 'Adam is the sweetest boy in class, but he's just not that bright,'" he says.

His grandmother, a beloved high school English teacher, quit her job to educate

him at home. She taught him to read in a matter of weeks—and nurtured his budding creative voice. "Some of the first words I ever wrote were poetry," he says. "She'd put a pad and pencil in my hand and tell me to go out in the yard and describe whatever my senses could find, whether that was the smell from her rose garden or the sight of an airplane cutting a contrail against the sky."

Today a Harvard-educated literary critic, bestselling author and professor of English and African American studies at UCLA, Bradley built his career as an authority on the 20th-century novelist Ralph Ellison while also exploring song lyric in popular music as an innovative and influential literary form, particularly within hip hop. His works *Book of Rhymes: The Poetics of Hip Hop* and *The Poetry of Pop* have been instrumental in this growing area of scholarly inquiry.

"Song lyric is a vital space for contemporary poetry," he says. "And hip hop offers us a means to engage with challenging issues—racism and classism, misogyny and homophobia, social justice and the promise of a multiracial American democracy—in a way where we're all bobbing our heads to the same beat."

Bradley explores this crucial space in the UCLA Laboratory for Race and Popular Culture, or RAP Lab, which he founded and directs. An interdisciplinary hub that invites scholars, students and community partners to spark critical conversations about society and politics, the lab is a key player in the UCLA Ralph J. Bunche Center for African American Studies' campuswide Hip Hop Initiative, which aims to establish UCLA as a center of gravity for hip-hop studies on the West Coast.

"It's exciting to work with colleagues here to envision what a hip-hop future could be, and to start building it right now," he says. "It's an opportunity I couldn't find on any other campus."

In all his work—at UCLA, as an arts and culture writer-at-large for *The New York Times' T Magazine*, and beyond—Bradley remains guided by the example set by his grandmother years ago.

"There's a continuity of practice on my part, and a dedication to craft, whether I'm publishing a profile on Anderson .Paak or writing about Toni Morrison," he says. "My entry point into this work is as a writer, first and foremost." [U](#)



DON LIEBIG/ASUCLA

UNITED WE STAND

THIS MENTOR AND MENTEE ARE MAKING A DIFFERENCE USING SCIENCE

Although the COVID-19 pandemic had the potential to unite us all via our shared, vulnerable humanity, instead, it largely exposed and exacerbated tremendous inequities. According to the Centers for Disease Control and Prevention, when compared to non-Hispanic whites, every other racial and ethnic group in the U.S. had an increased risk of infection, hospitalization or death.

UCLA psychology doctoral candidate Riley Marshall studies the way we talk about these COVID-19 racial health disparities and how they affect vaccination rates, looking to see if there's a link between health messaging from medical institutions and individual health behaviors. In particular, Marshall, who uses they/them pronouns, is working with their mentor Tiffany Brannon, assistant professor of social psychology at

UCLA, on a multi-study paper examining overlapping peaks of the pandemic and the Black Lives Matter movement.

"Our project examines potential connections between these two large-scale events," says Brannon. "For example, did the rise of anti-racist activism have consequences for the ways people were thinking about COVID? There's a lot of work that looks at how people are often the most cooperative when they're with similar others, but COVID is fundamentally a problem across all group lines."

Using data from multiple states, as well as news reports and Google search behaviors, Brannon and Marshall have found evidence that there is indeed a link between anti-racism engagement and lower vaccine hesitancy.

"It's really exciting to be on this project, where we're connecting theory to what we're studying as well as thinking about what can come next in terms of interventions," says Marshall, who won a Jenessa Shapiro Graduate Research Award in 2022. "It's one of the reasons I came to UCLA—researchers like Tiffany think in terms of the big picture."

Brannon and Marshall clicked instantly due to their shared tenacity when it comes to dismantling stigma and discrimination through science. In fact, the two were recently awarded a racial and social justice grant to combine their joint project with Marshall's individual research for a deeper dive into the intersection of anti-racism and COVID-19 behavioral outcomes and attitudes. Yet the noble scope and urgency of their work is not always reflected by the reality of how it may be received.

"We need science more than ever to speak to the problems in the world, but the misinformation out there can be deafening," Brannon says. "Scientists can play a role in actively combating this pushback with productive conversations, and I think it actually improves the science."

"This project is so deeply aligned with what got me—and Tiffany, too—into science in the first place: trying to address social issues that matter a lot, whether or not we've personally experienced them," Marshall says. "Good science is a long process, but neither one of us would ever give up on it." 

Tiffany Brannon
and Riley Marshall





LIFE'S WORK

HER ROLE AS DIRECTOR OF THE NEW CENTER FOR REPRODUCTIVE SCIENCE, HEALTH AND EDUCATION HAS WORLD-CHANGING POTENTIAL

According to the World Health

Organization, around 48 million couples and 186 million individuals face infertility globally—and yet, it wasn't until 2017 that the American Medical Association formally adopted a resolution to recognize infertility as a disease deserving of treatment.

"The decades before this impacted reproductive science research funding, diminished reproductive science-related content in higher education and created a socially unjust framework for access to infertility treatments," says Amander Clark,

an Australian-born American professor of molecular, cell and developmental biology at UCLA and president-elect of the International Society for Stem Cell Research.

To answer this vital need, the UCLA Division of Life Sciences has launched the Center for Reproductive Science, Health and Education, with Clark serving as its inaugural director. It will operate in partnership with the David Geffen School of Medicine at UCLA, the UCLA Jonsson Comprehensive Cancer Center, the Institute for Society

and Genetics, and the Eli and Edythe Broad Center of Regenerative Medicine and Stem Cell Research at UCLA.

"It's extremely important that a science-focused center like this be embedded in a number-one ranked research institution like UCLA, where it can reimagine how reproductive science is taught, broaden the pipeline for research training and increase the number of laboratories performing transformative research in this field," Clark says. "And the time is now—with changing policy on account of the Supreme Court, reproductive science research and education must be injected back into the system at all levels so that future policy decisions around reproductive wellness can be driven by science."

The center's work will include research into the reproductive and endocrine systems, contraception and infertility, pregnancy and pregnancy outcomes, as well as the social science of reproduction and reproductive interventions.

Plans are also underway for innovative outreach to high school students. This holistic approach is especially important with both global and American fertility rates declining as the age of first-time parents increases—and with interventions for infertility not covered by insurance in most U.S. states.

"Infertility affects all genders, races and ethnicities," Clark says. "We don't really understand why there are increasing levels of infertility today, but we should all care about this. Our fertility is what enables us to exist on the planet; if this is significantly compromised, you can imagine the consequences."

Always determined to become a scientist, Clark discovered her direction as a child when her father was diagnosed with testicular cancer, a disease of the reproductive organs that over her lifetime has gone from being a death sentence to having an extremely high cure rate. Ensuring that the new center makes a similarly concrete difference underpins her commitment to this work.

"I'm excited to transition from basic science to figuring out how this science can directly impact the people who need it most," she says. "This center will change the national and global conversation around these crucial topics, and I can't imagine a better place than UCLA for us to make it happen." [U](#)

WORLD OF WONDER

THEIR INNOVATIVE PROGRAM AWAKENS THE SCIENTIST WITHIN US ALL

In the right hands—namely, those of professor of Earth, planetary, and space sciences Jon Aurnou and postdoctoral fellow Jordyn Moscoso—science can be accessible and fun. Take Aurnou’s Simulated Planetary Interiors Laboratory, or SPINLab, which studies large-scale fluid dynamical phenomena that occur in and on planets.

“Jupiter has some of the largest atmospheric flow structures in our solar system. The surface structures that we see are organized into coherent, colorful bands and jets, which are driven by small-scale turbulent messiness in the planet’s interior,” Aurnou says. “We’re looking at how and why. Alternating jets of water don’t just organize themselves in your kitchen sink when you do your dishes, for example—so why don’t planets make messes when they are stirred?”

To get current Bruins as well as K–12 students and teachers excited about using science to explore fluid dynamics questions like these about the atmosphere, ocean and planets, Aurnou and Moscoso spearhead the popular program DIYnamics. It offers instructional videos, materials and do-it-yourself kit options—in multiple sizes, using materials ranging from Legos to turntables, and red food coloring to record

players—to give students and educators an opportunity to simulate planetary fluid dynamics at home or in the classroom by building and operating their own rotating tank experiments.

“Our hope for DIYnamics is to create tangible pathways for students to become engaged in climate dynamics,” says Moscoso, who helped found the Society of Gender Equity in Geosciences at UCLA as a doctoral student here in 2018. Currently on a National Science Foundation postdoctoral fellowship with joint appointments at UC Santa Cruz and the University of Southern California, she also studies the impact of wildfires on phytoplankton blooms in California’s ocean.

Moscoso and Aurnou have used DIYnamics to teach concepts of planetary fluid dynamics at UCLA and beyond, including at the national Earth Educators’ Rendezvous. The importance of this work goes back to where it began: As a graduate student one summer, Aurnou ran experiments with a rotating tank he found. The mesmerizing display shocked a distinguished faculty member, who couldn’t believe his eyes when he saw a visual representation of the theory he had studied for decades.

“A lot of times these phenomena are so big, it’s hard to wrap your head around what they even look like,” Aurnou says. “But if you can see it on your desk, control it, play with it, your imagination gets lit up. This is STEAM engagement we’ve designed to scale.”

A mainstay at UCLA’s annual Exploring Your Universe science festival and the subject of an official write-up in the *Bulletin of the American Meteorological Society*, DIYnamics has truly been a group effort that reflects its team members’ shared commitment to awakening the scientist within everyone.

“We want to make this accessible so people of all ages can make their own discoveries or just understand the world around them better,” says Moscoso. “Science is the language of discovery, and we want everyone to be fluent in it.” 



Jordyn Moscoso
and Jon Aurnou



HER CHEMICAL ROMANCE

SHE LOVES SCIENCE...AND ELEPHANT TOOTHPASTE

Laurie Tan's love affair with chemistry

began with Betty Crocker boxed cake mix.

"Growing up, I would bake a lot with my dad. After we mastered the box cake, we really thought we'd leveled up when we made chocolate chip cookies from the instructions on a package," Tan says with a laugh. "I was hooked watching the transformations in the oven. Baking is literally science, even though it feels like magic."

Although her powers are still limited by the laws of physics—at least for now—Tan's scientific prowess borders on the supernatural. Among many distinguished honors, the fourth-year chemistry major is one of UCLA's two recipients of a 2022 Goldwater Scholarship, a prestigious national award that supports future research leaders in the natural sciences, mathematics and engineering.

"As incredibly validating as it was to win—and I am so grateful to the UCLA Center for Scholarships & Scholar Enrichment for their support and guidance—I realized during the process how much progress I've made as a researcher," Tan says. "I've been in Professor Justin Caram's research group since I was a first-year, and it's been one of my favorite parts of my UCLA experience."

Fascinated by quantum science, Tan focuses her research on synthesizing semiconductor nanocrystals and understanding the mechanisms of the energy transfer.

"These materials are of interest to us because of their opto-electronic applications: they absorb and emit light in shortwave infrared, or SWIR," Tan says. "SWIR cameras can see through smoke and fog, so they have applications for detecting forest fires and improving plane cameras. The SWIR region of light is relatively underutilized—there are applications for solar cells and more that we're still discovering."

A leader outside of the lab as well, Tan is president of UCLA's Student Members of the American Chemical Society, where she discovered her love of teaching. Whether it's in person or online due to the pandemic, Tan always looks forward to leading demonstrations for kids of all ages at UCLA's free "science fair for all," Exploring Your Universe, where she uses fantastical experiments to teach key principles.

There's "oobleck" (pictured here, literally out of a Dr. Seuss book), made by mixing cornstarch and water, which serves as a gooey example of a non-Newtonian fluid, behaving as both a liquid and a solid. And, of course, "elephant toothpaste," where a combination of hydrogen peroxide, yeast, warm water and dish soap results in a dramatic exothermic reaction that creates a pachyderm-sized eruption of foaming bubbles.

"I love every chance we get to chat with kids about science and feed their curiosity, because chemistry is the coolest. It's wild to think that everything around us—and everything within us, too—is composed from the periodic table of elements," Tan says. "There's just so much to get excited about—chemistry makes me feel like a wizard." [U](#)



LIVING LANGUAGE

**HE'S ENGAGING WITH
AND WORKING FOR
INDIGENOUS CULTURES**

2022 brought a trifecta of important news for UCLA's Native American community. In addition to the announcement of both the University of California's Native American Opportunity Plan and UCLA's Native American and Pacific Islander Bruins Rising Initiative, UCLA's American Indian studies interdepartmental program was approved to become a full-fledged academic department.

"This has been a longtime goal. My only anxiety is that there's not exactly a playbook for how you transfer from being a program to a department," says Paul Kroskrity, who has chaired the program off and on for nearly 30 years and is currently the interim chair. "I'm ready to devote whatever it

takes. This represents a reprioritization by the university, and our faculty and students couldn't be more pleased."

Born in Brooklyn, Kroskrity is a professor of anthropology, specializing in linguistic anthropology and American Indian studies, who has been on the UCLA faculty since 1978 and working with the Village of Tewa of northern Arizona since 1973 and the Western Mono of central California since 1980. He began his career, however, thinking he would specialize in contemporary Chinese literature, exploring both its political and literary dimensions—until he enrolled in a life-changing linguistic anthropology course in graduate school at Indiana University.

"I took this class with Carl Voegelin, a very famous figure in the field of indigenous languages, where he brought in Shawnee speakers for us to transcribe," Kroskrity says. "He was amazed I could hear sounds that the other students weren't picking up. Between that and the fact that I had studied Mandarin, he recommended I work with the Tewa community."

Language documentation and revitalization have long been key to his work with the tribe, which has undergone a seismic shift from being a largely multilingual group to the youngest generations now learning their native tongue as a second language. Seeing this area of research, which seeks to document and revitalize endangered languages, become a global priority is extremely gratifying for Kroskrity—especially since it wasn't always the case.

"When I first started, very few students were interested in Native American languages, but now I'm seeing so many take an important interest in this urgent research, with many devoted to the possibility of working on their own heritage languages," he says. "I'm happy to do anything I can for communities to keep the parts of their culture that are embodied in language alive."

And, of course, this will call on all the varied talents, resources and potential Kroskrity sees at UCLA.

"The American Indian studies program has assembled an incredible faculty, probably the finest in the nation collectively, with remarkably gifted students," he says. "This is going to be a wonderful first year of departmentalization, but it's just going to be one of many." [U](#)

CITIZEN OF THE WORLD

WITH AN INTERNATIONAL FOCUS, SHE FIGHTS FOR HUMAN RIGHTS

Annabelle Werner has a certain *métier* for packing a suitcase.

Born in Alabama, the Army brat grew up living in Tennessee, Wisconsin, Kansas, Iowa, Pennsylvania, California and even Germany. In high school, she completed a service learning program in Laos, which inspired her to pursue international human rights opportunities at UCLA.

These pursuits coalesced into a pragmatic education on global governance and international development. She has volunteered at a community legal aid center in Tanzania, interned at an international justice nongovernmental organization in Switzerland, studied comparative judicial politics in France and interned remotely with a humanitarian NGO in Cameroon.

Ultimately, Werner felt most drawn to atrocity prevention and the rule of law, a focus she discovered after interning with the Global Centre for the Responsibility to Protect, going on to become a virtual student federal service intern with the Bureau of Conflict and Stabilization Operations in the U.S. Department of State. Accordingly, she crafted a unique triple major at UCLA, combining political science, international development studies and a self-designed focus in international human rights law.

"I discovered through the College Honors Program that you could create your own major with a capstone project, and so I was able to tie together everything I was looking for," says Werner, who is the editor of a student-run foreign affairs magazine and helped launch a digital publication focused on migration and human rights. "I also applied to the Undergraduate Scholars Research Program, earned a \$6,000 scholarship and expanded the capstone to a yearlong thesis on the African Court on Human and Peoples' Rights. I even spent part of my summer in Arusha, Tanzania, the home of the African Court."

Juggling all this may seem overwhelming, but Werner is supremely

disciplined—a quality reflected in her commitment to supplementing her studies with her career as a UCLA athlete in both cross country and track and field.

"I just came from a workout practice at 7 a.m., and then we have weight training later, so my athletics definitely keep my routine structured," she says with a

laugh. "The experience challenges me to keep pushing myself, and it allows me to stay mindful each day."

Although she plans on gaining expertise in a particular region or conflict first through research or journalism, Werner's goal is to become an international human rights lawyer.

"My experience and education have shown me how the law can be used as a tool to help actualize human rights, and I want to be a part of that," she says. "One of the beauties of UCLA is that you are encouraged to channel your energy and curiosity into whatever unique area you're passionate about—and there are always people who want to help you get where you're going." [U](#)





VIR/US: Drawing inspiration across the UCLA College from living in a viral world, in every meaning of the word

by Jonathan Riggs | art by Clare Mallison

Whether it's the more than 100 million cases of COVID-19 or the 11 billion YouTube views of "Baby Shark," we live in a viral world, with literally more viruses on Earth than stars in the universe.

Literal or metaphorical, viruses and their spread can tell us a lot about our planet and ourselves. At the UCLA College, the viral—in every sense of the word—continuously inspires innovative work across the liberal arts and sciences for the benefit of us all. Here's a sampling.



A NEW PERSPECTIVE

For the first 25 years of his career, Bill Gelbart worked exclusively on theoretical physical chemistry and physics, focusing on liquid crystals, polymers and other "complex fluids" and counting on others to conduct experiments to test his theories. But the distinguished professor of chemistry and biochemistry had an epiphany 20 years ago.

"I thought, maybe a theorist trained in physical science could contribute to understanding biological systems and processes if there were an example simple enough," Gelbart says. "And what's the simplest thing that evolves? Viruses! They're very successful organisms and get the better of us, even if they're not technically alive and have 1,000 times fewer genes than we do."

And so, in 2003, Gelbart—with Chuck Knobler, now a professor emeritus—launched a new lab: the Virus Group at UCLA, where physical scientists use their unique perspectives and expertise to study viruses.

Among the team's promising experiments are vaccines for virus and cancer therapies that use the mRNA technology at the heart of the COVID-19 vaccines. A key is their lab's ability to synthesize virus-like particles "from scratch" for delivering mRNA to targeted cells, whether they be immune (antigen-presenting) cells for vaccines, or cancerous or virus-infected cells for treatment.



"We don't understand anywhere near enough about cancer as we would like, and there will always be mutations in our genes that we have no control over," Gelbart says. "Even so, we're learning all the time how to better deal with cancer, especially by turning the immune system against it. The same goes for viruses, even though they, too, are here to stay, mutating faster than any of their hosts." 

THE SECRET LIFE OF BIRDS

Birds, like viruses, exist on every

continent and link geographical areas across the globe through their travels; they also carry viruses themselves, some of which are transmissible to humans.

Ben Tonelli and Wilmer Amaya-Mejia, UCLA doctoral students in ecology and evolutionary biology, study birds to better understand infectious patterns.



Tonelli looks into the role migratory birds play in spreading pathogens, especially those that can infect humans, while Amaya-Mejia focuses on understanding how living in and moving between human-dominated environments from L.A. to Cameroon affects birds, their DNA and the diseases they carry.

As an undergraduate at Bates College, Tonelli created the first mathematical model to visually illustrate how migrating songbirds transport ticks south; according to the CDC, approximately 476,000 Americans are diagnosed and treated for Lyme disease yearly, with an economic burden of up to \$968 million.

"Birds carry lots of diseases, and climate change is disrupting when and where these birds are over the year," Tonelli says. "Changing patterns of migration will mean changing patterns of where these diseased birds are in time and space."

Having earned a three-year NASA fellowship in 2022 to continue his research,

Tonelli will study pine siskins—which frequently come into contact with humans, thereby increasing the risk of disease spillover from birds to livestock, humans or both.

"Most people see disease as something that happens amongst humans and envision solutions at the human level: vaccines, quarantines, etc.," says Tonelli. "It's really important to recognize there are other solutions—or at least mitigating steps—we can take at an ecological level to reduce the risks among us humans. In fact, these early steps may be even more effective."

While birds are of interest to Amaya-Mejia, his true passion lies in their parasites and diseases.

"The fact that there's a secret, wild world going on right inside the tiny hummingbird that flew by you is definitely the most fascinating part about them," he says. "For example, I've spent the last four years studying malaria, which originated in birds."



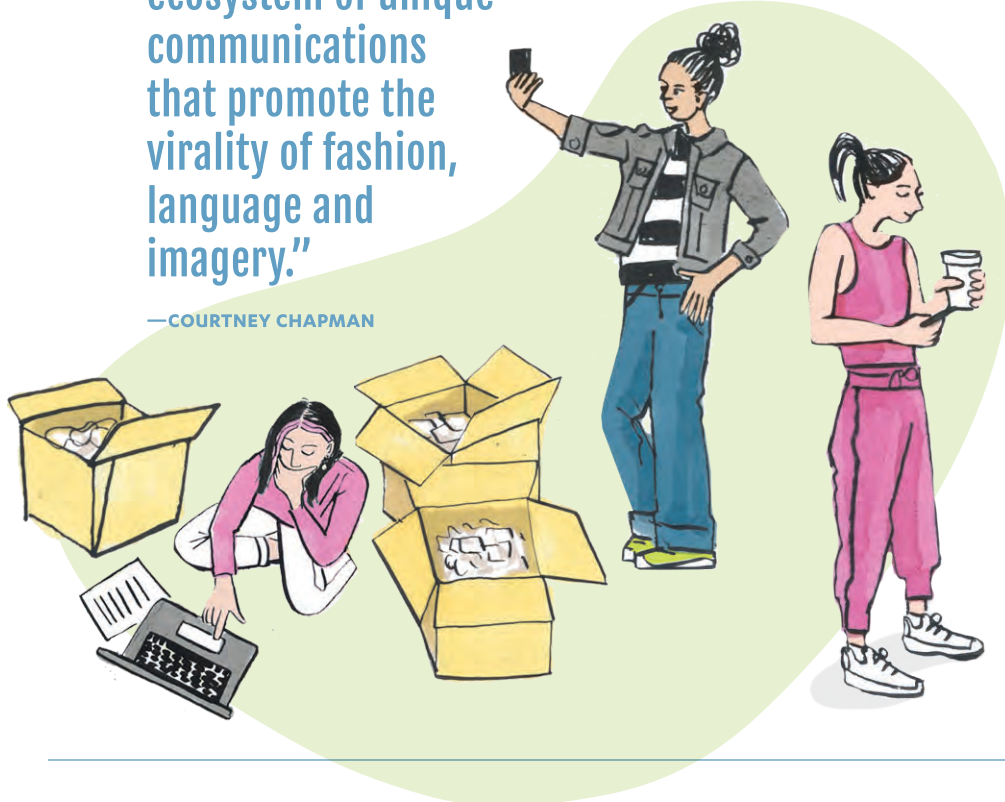
The way birds and their parasites have co-evolved tells a powerful story of natural balance reminiscent of viruses—and how delicate that balance can be as humanity's global footprint grows. This year, Amaya-Mejia earned a UCLA Institute of the Environment and Sustainability award to study the link between the increase in population of the dark-eyed junco in Southern California and urbanization and disease—specifically, the way that societal redlining has shaped viral and parasitic communities that co-exist with these birds.

His hope is that his work will empower the public to make choices that benefit us all, feathered or otherwise.

"Humanity's decisions will determine whether birds continue enjoying the complicated balance they have achieved, or if they lose it all due to havoc we set in motion, including overrunning the globe with viruses," Amaya-Mejia says.

"The internet has created an entire ecosystem of unique communications that promote the virality of fashion, language and imagery."

—COURTNEY CHAPMAN



"Any time you see a bird, remember that you have the ability to have a strong impact on the environment, both for their sake and ours." 

HATE IS A VIRUS

"Sadly, hate has been a persistent presence in human relations for millennia, and its capacity to spread like a virus has increased dramatically with the internet," says David N. Myers, the Sady and Ludwig Kahn Professor of Jewish History at UCLA. "We need to figure out ways to mitigate and dilute it."

Accordingly, in 2022, UCLA launched the Initiative to Study Hate, a three-year pilot program uniting scholars from nearly 20 disciplines across campus. Directed by Myers and housed in the division of social sciences, it serves as an umbrella for 23 inaugural social impact projects, including studying the erasure of Black histories and

spaces, the bias perpetuated by artificial intelligence and the effects of bullying and the criminal justice system on LGBTQ youth.

"This initiative is the most important work I've ever done; it's audacious, so much so as to invite skeptics," says Myers. "But it is exactly what we need to be doing at UCLA—leveraging our research excellence to confront big, tough challenges out there in the world. Hate is so pervasive as to demand that we do all we can to understand and defeat it. We have no choice." 

SOCIAL MEDIA'S PROMISE AND PERIL

"The internet has created an entire ecosystem of unique communications that promote the virality of fashion, language and imagery," says Courtney Chapman, a first-year graduate student in the UCLA Animation Workshop. "This never-ending sea of content that fluctuates in relevancy by the minute is so interesting, especially for someone like me, who utilizes this virality to make physical artwork."

A sculptor since the age of 8, Chapman was a UCLA undergraduate English major when she launched a business, CosmicFuss, via TikTok. Selling jewelry and other items crafted based on memes and viral pop culture moments—Jordan Peele's Monkeypaw Productions gave her a social media shout-out for her Nope cloud earrings—Chapman built a thriving company in her spare time. That first-ever TikTok she posted of her artwork earned 5 million views in two days; for the next month, every video she posted got more than a million views.

"It felt like I had hundreds of thousands of friends for a few weeks at age 18, but what happens when your moment fades?" Chapman says. "It took a lot of growth on my end to be OK with that shifting attention. I have to remember that these numbers should motivate and not consume me."

In the end, Chapman hopes her art capitalizes on the internet's viral power to unite rather than divide. The web's double-

THE REGENERATIVE POWER OF STORYTELLING

One of today's most timely works of literature was composed in the mid-14th century, according to Raphaëlle Burns, an assistant professor in UCLA's department of European languages and transcultural studies.

The *Decameron*, Giovanni Boccaccio's Italian masterpiece, concerns 10 young Florentines who tell stories as they self-isolate in the context of a terrifying plague epidemic they feel is profoundly reshaping—perhaps even ending—the existing sociopolitical order. This collection of novellas was composed in direct response to the then-recent Black Death, the most fatal pandemic ever recorded, which reduced the world population by as much as 200 million and decimated the city of Florence.

"Crucially, the heroes and heroines of the *Decameron* are overwhelmingly young. The text entrusts the question of what a new community, a community after the plague, should look like to the young," Burns says. "Thus, the text resonates in the classroom today not only because of parallels we can draw between the Black Death and COVID-19, but more specifically because it is a text that intends to empower

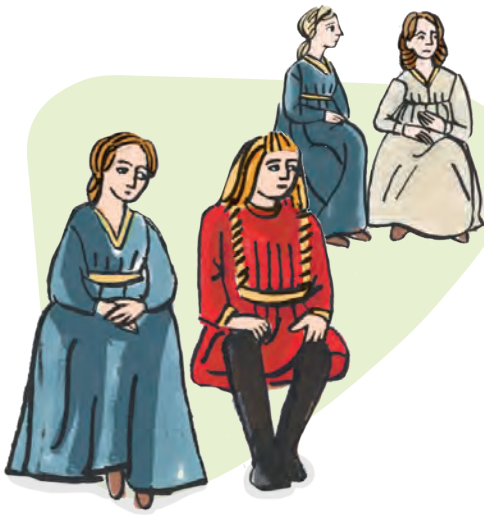
new generations and foster in them the optimism, generosity and responsibility needed to reimagine their world."

The power of these young protagonists lies principally in their ability to tell and interpret stories. In the preface to the *Decameron*, Boccaccio proposes storytelling as a therapeutic endeavor; in the text's conclusion, he suggests that stories—like a drug—are potencies that can either poison or cure depending on the circumstances of their telling and the audience's disposition.

"More than a book, the *Decameron* is an invitation to tell stories and to reflect collectively on them as the touchstone of every civic project," says Burns. "The ethics of civil conversation illustrated in Boccaccio's circle of storytellers responds to the potentially 'viral' effects of storytelling, and to the contagious dangers of collective panic, as an antidote—a kind of immune system available, if nurtured, to every city and every community." [U](#)

"Hate is so pervasive as to demand that we do all we can to understand and defeat it."

—DAVID N. MYERS



edged-sword nature also inspired Shanell Logan, a transfer student set to graduate this year from UCLA with a degree in sociology, to tackle an independent research project of her own devising.

While studying abroad at Cambridge, Logan realized many TikTokers used the platform for personal discussions about women's and reproductive health issues by sharing information about treatments, experiences and options—and that these discussions had a real-life impact on viewers' medical choices.

"I saw this connection even when the information shared wasn't accurate," Logan says. "We're not just looking at health care and medical issues here, but influential issues of how people obtain knowledge."

Impressed, UCLA Professor of Sociology Stefan Timmermans became Logan's advisor, helping her strengthen and formalize the project to continue and expand it after graduation.

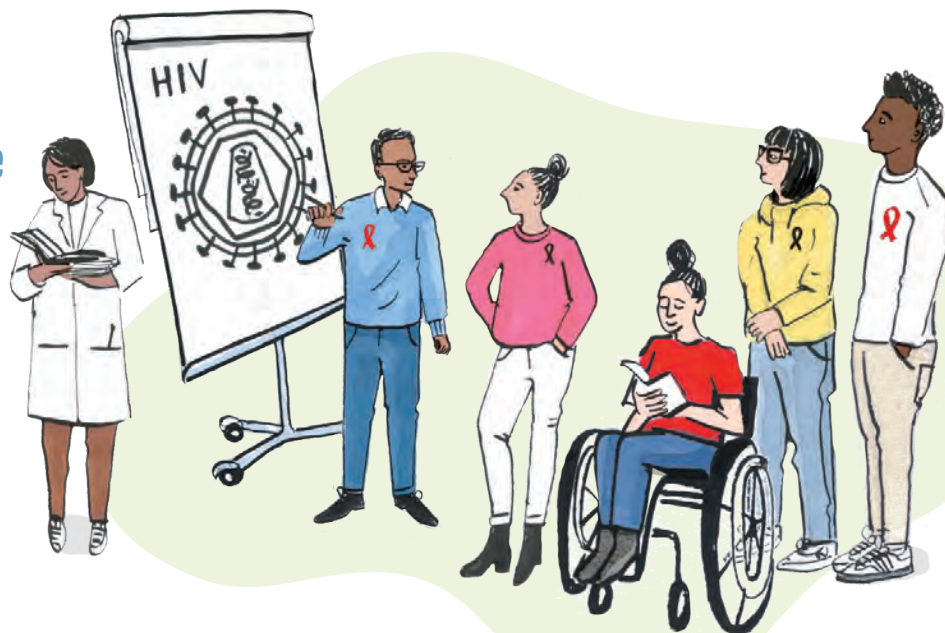
"I'm barely in the data collection phase, but an overall takeaway I'm seeing is that the medical profession needs to do a better job by anyone with a uterus," Logan says. "While there is definitely misinformation on social media, it's important to recognize the nuance where someone is earnestly trying to show their perspective and just has a gap in knowledge. My goal is to efficiently, effectively address that gap." [U](#)





“Viruses have taught us a ton about biology, but also about society.”

—OLIVER FREGOSO



SMALL BUT MIGHTY

The world’s deadliest animal by far is the mosquito; the World Health Organization estimates that illnesses passed by the insects—including those caused by the West Nile, dengue, chikungunya, yellow fever and Zika viruses—kill over 725,000 people a year and sicken millions more.

In her lab, Melody Man Hing Li, the Johanna F. and Joseph H. Shaper Family Chair in Microbiology and an assistant professor of microbiology, immunology and molecular genetics at UCLA, studies host-cell interactions of mosquito-borne RNA viruses with the goal of identifying both cellular and viral targets for antiviral intervention.

“We have been in an evolutionary arms race with viruses for as long as we know. An interesting story: In 1950, Australia released myxoma virus to wipe out the invasive rabbit species,” Li says. “Within a decade, the rabbits evolved resistance, including mutations in the interferon gene that allows them to better target the virus. As a result, rabbit numbers are on the rise again!”

Similarly, the idea of wiping out all mosquitoes or viruses would prove



impossible. In fact, viruses have played a critical role in human evolution and development; a significant portion of our genome consists of retroviral sequences, some of which have been coopted for new biological functions. For example, syncytin, the gene responsible for placental development, came from the insertion of a retroviral envelope gene that fuses cells together.

In addition, by studying mosquitoes, we have learned a lot about how sensory stimuli are perceived and processed—a recent study identified carboxylic acids in the skin as the reason some people are particularly appealing to mosquitoes.

A self-described “mosquito magnet” herself, Li is fascinated by the similarities between the insect and the viruses it can transmit—both seemingly so delicate, yet actually world-changing in their power.

“My sense of wonder for nature has been constantly renewed through the lens of viruses, as they have taught us so much about cell biology, immunology and evolution,” Li says. “Doing basic research in virology keeps me curious—it’s my lifelong passion.” 

TRANSFORMED BY A PANDEMIC

Anyone who baked bread, quarantined with family or engaged in crafts during COVID-19 saw a social sea change firsthand. According to work conducted by Patricia M. Greenfield, distinguished professor of psychology at UCLA, and her grandson, Noah F.G. Evers, a student at Harvard, the pandemic shifted our 21st-century societies closer to the ecology of the survival-oriented communities in which humans evolved.

The two found that this rise in subsistence activities echoed the historical evolution of intelligence—in times of need, practical and community-oriented social intelligence are valued more highly than abstract intelligence—which led to the creation of their “Model of How Shifting Intelligence Drives Social Movements.”

“We linked these cultural changes to Black Lives Matter, because people were acting collectively to support the Black community and carrying out direct action



on the street, rather than representing action more abstractly online,” says Greenfield. “Subsequently, we realized that these features also applied to the shared values of a very different community and their social movement: the January 6 attack on the Capitol. And our model has been further validated right here on campus and across the UC system, where we recently experienced a collective social movement involving the direct action of picketing in academia’s largest strike ever.”

Greenfield and Evers’ model also predicts that, as conditions move closer to pre-pandemic levels of “normal,” so will psychology and behavior—although the pandemic will have multiple future impacts. For example, individuals in their critical period for cultural learning (typically between the ages of 9 and 25) during COVID-19 are more likely to go on to create significantly more social movements, because they will have elevated levels of practical intelligence and collectivistic values.

The fact that these studies and work even exist is a tribute to the lasting impacts of COVID-19.

“Grandma and grandson working together during the lockdown is also in line with my theory,” says Greenfield, “that COVID moves us in the direction of family practices that were common during an earlier era.”

“My grandma and I strengthened our social bonds and became a lot closer through our research,” Evers adds. “And that’s our ultimate takeaway: When the world gets more dangerous—due to the threat of a global virus, for example—human psychology optimizes for strengthening social bonds and solving social problems.” 

LEARNING AND LIVING

“A lot of people today think that HIV is not a problem anymore,” says Oliver Fregoso, an assistant professor of microbiology, immunology and molecular genetics at UCLA whose lab studies the virus. “The reality is that if you are infected with HIV, it is there for life.”

Of the more than 84 million people infected worldwide since the beginning of the epidemic, only five have ever been reportedly “cured.” The nature of the virus makes the reality of developing a universal cure or vaccine—a desperately longed-for priority for more than 40 years now—an especially daunting challenge.

“I’m an optimist; I’d like to think in my lifetime we will find a way. There’s been great progress,” Fregoso says. “But I’m also a realist, and it’s going to require lots of continued research to ever get there. Seeing the pace at which we got a vaccine for SARS-CoV-2 is quite phenomenal.”

Fregoso and his lab study HIV and the viruses it’s related to, called lentiviruses; there are also about 40 nonhuman primates that have their own lentiviruses similar to HIV. Fundamentally, Fregoso and his team want to know how the virus replicates within a cell, how it spreads between cells and individuals and how it jumps from one species to another.

“On the most basic level, we want to know mechanistically: How do the proteins of the virus and the proteins in the cell interact to enable that to happen or inhibit that from happening?” he says. “And all the work that we do for HIV will also help as we face other emerging viruses.”

Ultimately, viruses present an opportunity for us to learn, both about them but also about ourselves. After all, our shared vulnerability links all life on Earth.

“Viruses have taught us a ton about biology, but also about society. Think about how eye-opening both the COVID and HIV pandemics have been,” Fregoso says. “It’s so important that we as scientists do a better job explaining what we know to the general public, and that we all respond to one another with compassion and the knowledge that viruses can impact and teach us all.” 





THINKING GLOBALLY

by Lucy Berbeo | art by Brave the Woods

Whether visiting another country for the first time or gaining wide-ranging perspectives on campus, UCLA's undergraduate students in all majors are receiving a truly global education. For many, this experience proves a turning point in their academic and future lives.

Each year, students can choose from approximately 180 study abroad programs offered through UCLA's International Education Office, which also counsels participants on academic, cultural and financial issues. Options span more than 40 countries and include faculty-led summer courses with UCLA Travel Study, hands-on work opportunities with the UCLA Global Internship Program and traditional immersion at partner universities in the UC Education Abroad Program.

"Through study abroad, our students learn not only about the world but about themselves—their passions, skills and abilities," says Adriana Galván, dean of the UCLA Division of Undergraduate Education. "They are future leaders in their fields, and the study abroad experience is often a first step on that journey."

Here are some stories of the entire world becoming the backdrop for a Bruin education.

AT HOME AND AROUND THE WORLD, BRUINS ARE LEARNING TO MAKE A DIFFERENCE



CAPE TOWN, SOUTH AFRICA

KIMIA MOHSENI

HOMETOWN: Tehran, Iran

MAJOR: Pre-med psychobiology

STUDY ABROAD PATH: UC Education Abroad Program

After losing my grandmother, I decided to pursue a career in medicine.

My grandmother passed a year after being diagnosed with cancer, but I saw how hard the medical team tried to help her, and at the very least, they were able to prolong her life and reduce her pain greatly. Because of that, I had the chance to spend more time with her. That's the main reason I'm pursuing medicine: I want to be able to give people a second chance when life does not, or at the very least, ease their pain.

In Cape Town, I interned at a nonprofit that educates young people about preventing STIs, HIV and teen pregnancy. The kids in our township didn't learn about these things in school—we were their main source of knowledge. But we struggled with attendance, so one day, I decided to plan a fun event with snacks and a movie to encourage the kids to come to our center. We expected only 30, but we had over 100 students that day! I was so happy to help educate them as well as create a memorable event.

Learning how cultural issues can affect health was important to me; in my career and life, I want to approach people of all backgrounds and cultures with respect. I also enjoyed learning about the country's history and seeing some of its natural beauty on weekly hikes with my South African friends.

I believe when we are placed in a new environment, we face challenges that can make us stronger and wiser. My experience in South Africa helped me learn new skills, increase my self-confidence and become a better version of myself overall. 



HO CHI MINH CITY, VIETNAM

BLADAM GOMEZ

HOMETOWN: Oxnard, California

MAJORS: Pre-law sociology | public affairs

STUDY ABROAD PATH: UCLA Global Internship Program

My goal is to become an attorney, so I'm exploring different areas of study to decide what kind of law I'll ultimately pursue. I chose this internship program because I wanted to see how workplaces can differ culturally in other parts of the world, and because I had never traveled outside North America. With the rise in technology and globalization, I think it's more important than ever to be exposed to other cultures and develop intercultural respect and understanding.

In Ho Chi Minh City, I interned for an international corporate law firm, helping with investigations; I also learned about new legal areas, including intellectual property. On one of our cases, a client was interested in opening a business in either Australia or in Vietnam, and my job was to help effectively persuade them to choose Vietnam. It felt meaningful working to boost investment in the economy of a country that has been overlooked by businesses in the past.

Some of my favorite memories are trying pho for the first time in Vietnam—the best pho I've ever tasted—and traveling to Halong Bay, a UNESCO World Heritage Site. I also enjoyed meeting a lot of new people from different parts of the world.

Through this experience, I gained more confidence that I want to pursue law—and I discovered that traveling is a passion of mine! For anyone considering study abroad, don't be afraid to step out of your comfort zone. I never thought I would be so far away from home, and now traveling is something I truly love. 



NANTES, FRANCE

CATHERINE CHARLES

HOMETOWN:

Chapel Hill, North Carolina

MAJORS:

Cognitive science | European languages and transnational studies with French and Francophone

STUDY ABROAD PATH:

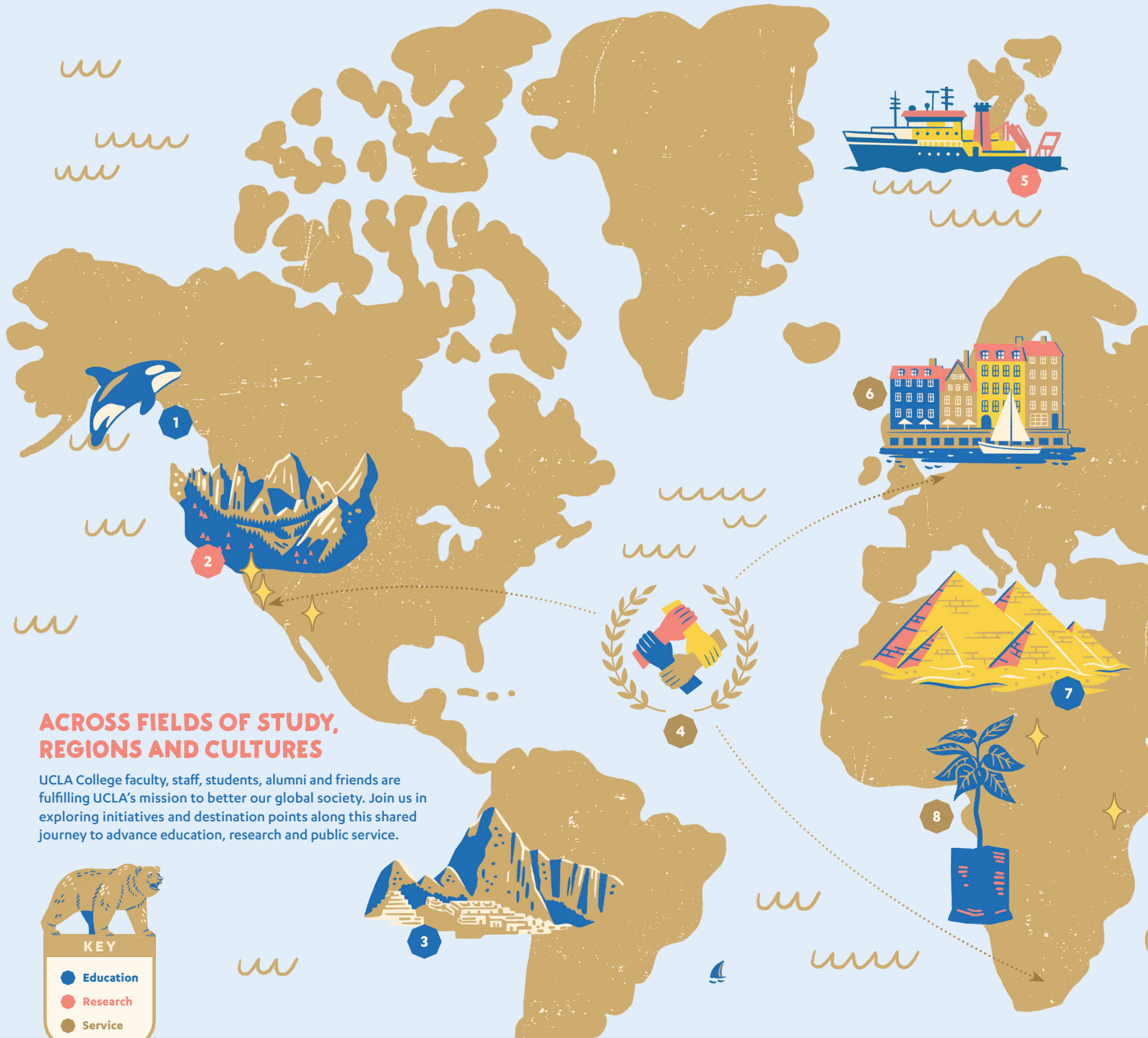
UCLA Travel Study

My love of French started in middle school, when I did a Belgian exchange program and was motivated to become fluent. I added cognitive science as a second major because I love its interdisciplinary nature, with concentrations in psychology and computer science; this major has also sparked my interest in coding and application development.

Given that climate change is one of today's most pressing issues, I was inspired to visit Nantes, a city known as a green capital of Europe. I learned that we can take amazing aspects from one culture and adopt them into our own—for example, many of Nantes' sustainability efforts would be easily applicable here in Los Angeles. I enjoyed our day trip to the salt marshes in the nearby medieval town of Guerande, where we saw the biodiversity up close and observed the ancient practice of salt harvesting.

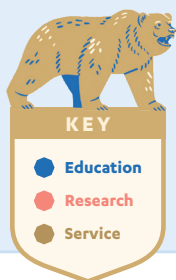
We learned about Nantes' history as well: at the height of the transatlantic slave trade, the city was a major slave port, a role it acknowledges today with the Memorial to the Abolition of Slavery. The memorial's interior was designed to resemble that of a slave ship, and as you enter, you can see the Universal Declaration of Human Rights and the word "freedom" written in over 40 different languages.

Language study allows you to build cross-cultural relationships, which are especially important in the rapidly changing cultural landscapes in the U.S. and abroad. I hope to continue to build such relationships here at UCLA and across other communities in the future. 



ACROSS FIELDS OF STUDY, REGIONS AND CULTURES

UCLA College faculty, staff, students, alumni and friends are fulfilling UCLA's mission to better our global society. Join us in exploring initiatives and destination points along this shared journey to advance education, research and public service.



1. LIFELONG LEARNING OPPORTUNITIES

Through UCLA Alumni Travel, Bruins can continue gaining new global perspectives by choosing from tours to Alaska, Peru, Thailand, Costa Rica, the Galápagos Islands and more, where they can learn about each destination's culture, history and local life.

2. FIELD RESEARCH IN THE SIERRA NEVADA

Undergraduates in the UCLA Department of Earth, Planetary, and Space Sciences travel to the remote White Mountain Research Center in the Sierra Nevada, known worldwide as an unmatched site for earth science education, to learn field geology with Distinguished Professor An Yin in the department's summer field program.

3. INDIGENOUS LANGUAGES OF THE AMERICAS

The UCLA Department of Spanish and Portuguese offers courses in Quechua, an indigenous language spoken by millions of people across the Andes. Learners gain deeper cultural knowledge through creative projects including translation, filmmaking, gastronomy, writing poetry, campus events and more.

4. DIVERSITY IN HIGHER EDUCATION RESEARCH COLLOQUIUM

Representatives from UCLA, Vrije Universiteit in the Netherlands and the University of the Free State in South Africa gather annually to advance social justice in higher education. Abel Valenzuela, interim dean of social sciences, and Charles Alexander, associate vice provost for student diversity, lead the effort at UCLA.

5. SCIENTIFIC RESEARCH UNDER THE SEA

Tina Treude, UCLA professor of marine geomicrobiology, conducts seagoing expeditions around the world, from the Arctic Ocean to the South Pacific. Students wishing to follow in her footsteps can start by collecting oceanic samples aboard the UCLA Zodiac, a Bruin research vessel.

6. KOMAR SHIDELER CENTENNIAL SCHOLARS STUDY ABROAD SCHOLARSHIP

Established in 2019 through the generosity of Ross Shideler and Kathleen Komar, and with matching funds from the UCLA chancellor's office, this award has made it possible for UCLA College undergraduates to study abroad in Denmark, France, Italy, South Africa, South Korea and Spain over the past two years.



PRITZKER EMERGING ENVIRONMENTAL GENIUS AWARD

Funded as part of a \$20-million gift to UCLA from the Anthony and Jeanne Pritzker Family Foundation, this \$100,000 annual award is given through the UCLA Institute of the Environment and Sustainability to innovative young champions for the environment.

2022

DYSMUS KISILU | Kenya
Entrepreneur whose business, Solar Freeze, protects the environment and supports small-scale farmers

2021

FARWIZA FARHAN | Indonesia
Founder of Forest, Nature & Environment Aceh, an Acehese NGO striving to protect the Leuser Ecosystem in Sumatra

2020

CLARA PRATTE | Flagstaff, Az.
Navajo sustainable business advocate who co-founded a company, Navajo Power, to benefit local communities on tribal lands

2019

HINDOU OUMAROU IBRAHIM | Chad
Indigenous rights advocate and coordinator of the Association of Peul Women and Autochthonous Peoples of Chad

2018

MIRANDA WANG | Menlo Park, Ca.
Co-founder/CEO of Novolooop (fka BioCollection), an invention that upcycles plastic waste to create new materials

2017

DAN HAMMER | Berkeley, Ca.
Co-founder of a nonprofit organization, The Earth Genome, that uses environmental data to transform decision making

7. PATHWAYS TO EGYPTOLOGY

With Howard University, the UCLA Department of Near Eastern Languages and Cultures launched a "Pathway to a Ph.D." pipeline program, co-led by chair and professor Kara Cooney and academic administrator Jonathan Winnerman, to increase representation of Black students in ancient Egyptian, North African and Western Asian studies.

8. THE CONGO BASIN INSTITUTE

The Congo Basin Institute, a joint initiative of the International Institute of Tropical Agriculture and UCLA, advances conservation and human development in Central Africa. Scientists including founding director Thomas Smith and senior research fellow Elsa Ordway seek solutions to the interconnected challenges facing the world's forested regions.

9. CLIMATE RESEARCH IN ANTARCTICA

Marilyn Raphael, professor of geography and director of the UCLA Institute of the Environment and Sustainability, and Aradhna Tripathi, professor, founder and director of the Center for Diverse Leadership in Science, are leading scientists and educators who have each conducted on-the-ground climate research on the Earth's southernmost continent.

10. SOUTHEAST ASIAN STUDIES

Within the Southeast Asian Studies major, launched in 2021 in the UCLA Department of Asian Languages and Cultures, students can concentrate in Filipino, Indonesian, Thai or Vietnamese language studies and gain cultural knowledge through coursework spanning the humanities, life sciences and social sciences.

11. JAPAN PAST & PRESENT

UCLA's Yanai Initiative for Globalizing Japanese Humanities and Waseda University in Tokyo are developing this new digital hub for interdisciplinary, international research in the Japanese humanities. The project benefits and facilitates communication among scholars around the world who work in this field.

12. THE DIVERSITY PROJECT

The Diversity Project, run in partnership with UCLA ecology and evolutionary biology professors Paul Barber and Peggy Fong with HBCU-UC and National Science Foundation support, aims to increase participation of underrepresented students in marine biology and conservation. Participants travel to the island of Mo'orea to explore marine science.



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KEEPING
THE FAITH
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HUMANITY
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Faces of Big Data

**How the UCLA College is harnessing a titanic
new engine of equity and discovery**

by Michael Agresta and Jonathan Riggs
art by Mimi Chao J.D. '09 / Mimochai Studio

Can an algorithm help improve outreach to prevent homelessness?

A new Los Angeles County program in collaboration with UCLA data scientists at the California Policy Lab is betting \$14 million that the answer is yes—the groundbreaking new Homelessness Prevention Unit uses predictive analytics to identify individuals most at risk.

Till von Wachter, professor of economics and faculty director of the California Policy Lab's UCLA site, explains how the data scientists painstakingly linked 500 different factors of previously siloed, anonymized client data from eight different county agencies. Individuals whose resulting risk profiles closely align with those of previous clients who have become homeless are flagged to receive individualized care from social workers housed in the new L.A. County prevention unit.

"We're looking for a needle in the haystack," von Wachter says. "We use a big data approach, machine learning. It's an ideal example of how cutting-edge data science research and the use of very, very large data sources can really make a difference on the ground and lead to something tangible."

The approach represents an epochal transformation in the way science, policy work and social inquiry at the UCLA College are changing the world in the era of big data. From fighting disease to predicting wildfires to calculating the true costs of mass incarceration, complex data science touches every discipline, animates vital new conversations and illuminates long-sought discoveries.

A Data-Driven World

In the past academic year, the UCLA Department of Statistics became the UCLA Department of Statistics and Data Science—but not because of any changes at the departmental level. Rather, the new name reflects increased recognition in an evolving world of the importance of data to everyone and everything. In this sense, the world has evolved toward the department's view.

"This is not some trend we're reacting to—we've been trying to learn from data since before data was big," says Mark S. Handcock, professor of statistics. "These questions have always existed, and we've always been exploring them."

The name expansion underscores the fact that these explorations transcend academic disciplines, adds Mario Bonk, professor and chair of the department of mathematics.

"This doesn't mean that statistics has the monopoly on data science," he says. "It just means that there are more opportunities for interdisciplinary collaborations on a wider, more impactful scale."

Proof positive: UCLA's data theory major, which was established in 2019 and spans math as well as statistics and data science. Now one of the most popular majors in either department, it is primarily intended for students who wish to gain a deeper understanding of the principles underlying data science so they can build tools, theories and processes to further the field.

"It's an innovative major that is very different from the cookie-cutter data science majors cropping up at universities all over the country. We've given it a more theoretical focus," says Mason Porter, professor of mathematics. "We've created a lot of innovative new courses for it, including data-driven modeling of complex systems, the societal impact of data and an 'Experience of Data Science' capstone in which students work on teams with data from an industrial partner."

In 2021, UCLA also established a social data science minor—created by Handcock—for students majoring in social science disciplines. The demand for such courses and expanded programming reflects the real-world need for graduates who can work with data—a need that continues to grow stronger.

"In all the rankings, like in *U.S. News & World Report*, statisticians and data scientists are at or near the top of the best jobs," says Hongquan Xu, professor and chair of the UCLA Department of Statistics and Data Science. "The job opportunities are just incredible. At our 'Data Theory in the World' seminar, people in the industry shared with our students that for every graduate in this field, there are at least five job offers."

It makes sense. After all, the applications of data and the synergy of math and statistics surround our society in every way possible. Take, for example, the attempt to successfully launch self-driving cars.

"This has only become possible by new methods that are able to process huge data in real time," says Bonk. "And everything that's under the hood consists of powerful mathematical methods."

That said, there is a tendency by the media and the general public to reduce these types of efforts, initiatives, research and breakthroughs to the simplest terms.

"I think that people use the term 'big data' without really knowing what they mean by it. People ought to focus on whether data is 'good,' 'bad,' 'ugly' or 'useful.' Any of these adjectives can apply to 'big data,' and any of them can apply to 'small data,'" Porter continues. "Rather than focusing on whether or not data is large, we should be focusing on analyzing data well and analyzing it responsibly with respect both to scientific rigor and to societal impact."

This thoughtful, grounded approach is especially important in light of how mighty a force data truly is.

"Data is the new electricity. It's moved from being seen as an incredible, magical thing that we can't possibly understand to something that we can at least observe in terms of its enormous energy and use," says Handcock. "And then, over time, we forget about the incredible power of it. We switch on our lights, our computers; everything just runs in the background."

"We're going through the same things with data—soon enough, we won't be talking about big data anymore," Handcock concludes. "It will just be part of everything that we all do."

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Rather than focusing on whether or not data is large, we should be focusing on analyzing data well and analyzing it responsibly with respect both to scientific rigor and to societal impact.

—MASON PORTER

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Public and Planetary Health

"I'm definitely very happy about this data revolution that's happening, where people are taking data analysis seriously," says Rick Paik Schoenberg, professor of statistics. "It's obvious both at UCLA and beyond."

He finds this true in both his teaching role and in his research, which has involved using data to create forecasting models for earthquakes, wildfires, crime and even disease.

For some of this work, he has partnered with Andrea Bertozzi, UCLA's Betsy Wood Knapp Chair for Innovation and Creativity, director of applied mathematics and distinguished professor of mathematics and mechanical and aerospace engineering. When the COVID-19 pandemic began, the two were asked to volunteer on a Los Angeles County Department of Public Health committee to forecast the number of hospital beds, personnel and equipment that would be needed per day.

"It was a remarkable time—thrilling but also scary—for us to see the mathematical modeling making an impact at that level," Bertozzi says, "because of the high stakes of what the county would decide after taking the information we provided into account."

Bertozzi and Schoenberg were able to get many graduate and even undergraduate students involved in this research. And the pair has continued to push forward, both together and individually, on other projects that use similar tools and approaches.

"I have a component of my research that involves sorting through large batches of data, sometimes incorporating active learning where a human is involved in the algorithm," Bertozzi says. "For example, we're working on remote sensing with scientists at Los Alamos National Lab, and they're interested in detecting surface water in remote areas like the Arctic. This is a big issue if you're looking at global warming—how can you take these data and predict where water and other resources will be?"

This type of research dovetails with work being done by Karen McKinnon, an assistant professor in both UCLA's department of statistics and data science and the Institute of the Environment and Sustainability.

"There has been an explosion of tools, most using open-source software, which reveal new avenues for data analysis. The challenge is determining which tool is the right one for the scientific question of interest," says McKinnon. "I am most excited about big data methods that have the potential to allow us to learn something new about the climate system. The most exciting future directions are at the interface of physics and machine learning, wherein physical constraints are used in tandem with purely data-driven models."

Using statistical methods to bridge the gap between simulations and observations can provide much-needed insight into better understanding how Earth's climate has already changed—and how it may continue to do so.

"Much of what we know about the environment is from measurements that we have taken across time and space, and statistics can help us make sense of this data," McKinnon adds. "Across the UCLA Division of Physical Sciences and beyond, there is a huge number of faculty using data to do interesting, cutting-edge work about climate science and human responses to climate change."

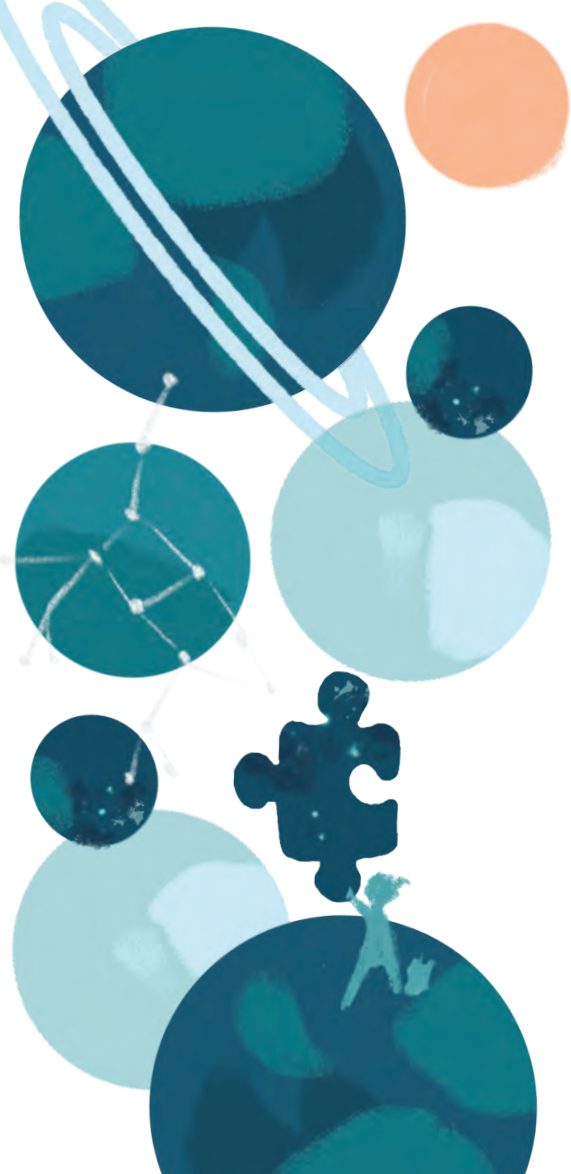
The eagerness of students to get involved in this field, and the potential they see in it to make a big difference for the future of the world, hits home with Schoenberg every day in his role as director of the department's master of applied statistics and data science program.

"We're getting more than 400 applications a year for this one program alone, our alumni are getting good jobs and a lot of companies are wanting to partner with us," Schoenberg says. "It's definitely an exciting time to be a statistician."



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—KAREN MCKINNON



New Frontiers

Besides the countless uses of big data in our daily lives, the concept stretches far beyond our planet.

"Space physics has so much satellite data and observations, it's getting harder to go through it in the traditional way," says Jacob Bortnik, professor of atmospheric and oceanic sciences as well as the faculty director of the UCLA Space Physics and Planetary Sciences, Applications, Communication and Engineering (SPACE) Institute. "You need something a lot more sophisticated to pick up subtle patterns, and machine learning and AI are exactly those kinds of tools."

Bortnik and his team use these tools so frequently, in fact, that he authored a how-to article in 2021 for *Eos* on using machine learning in Earth and space sciences. One of their main uses has been aiding Bortnik and his team in reconstructing 3D dynamic models of inner space—the area between the Earth's upper atmosphere and geosynchronous Earth orbit—to predict and respond to space weather, which can involve electromagnetic fields directly affecting the performance of technology in space and on Earth.

For example, in the last year, about 40 SpaceX Starlink satellites were impacted by a geomagnetic storm that resulted in them falling back to Earth in, as Bortnik puts it, "a spectacular billion-dollar display of light." And you don't have to be a billionaire CEO to be impacted; currents like these can also affect the lives of everyday citizens via power grids, internet cables, GPS and even credit card systems.

Another way to comb through massive quantities of space-related data is to empower citizen scientists to aid in its parsing. Jean-Luc Margot, a professor of Earth, planetary, and space sciences and of physics and astronomy, is also the lead researcher of the "Are we alone in the universe?" project for the UCLA SETI group, which allows interested community members from every walk of life to join in the search for extraterrestrial intelligence by classifying radio signals.

Similarly, Emmanuel Masongsong, program manager for UCLA's Experimental Space Physics Group, has joined forces with an international team to help launch HARP, or Heliophysics Audified: Resonances in Plasmas, where volunteers can help NASA scientists potentially discover plasma waves.

"HARP employs a simple web interface to make space weather more tangible, converting magnetic data into sound. It empowers students and the public to use their senses to pick out complex or subtle patterns in the noise, helping scientists to scour through decades of satellite observations," he says. "While analyzing real satellite data can be messy, having a hand in authentic NASA research is inspiring and exciting."

Describing the experience as an opportunity for these citizen scientists to respond to the "music" around Earth, Masongsong calls projects like these game-changers.

"By exposing people to the exciting dynamics of our space environment, HARP validates that anyone can make contributions to science," he adds. "We want to empower people to focus on what they feel is exciting or notable, since this broad array of experience is valuable for analyzing novel data sets."

Just as many on Earth are using big data approaches to better understand space, many are also using space-collected data to better understand conditions on Earth—and even profit from them. Bortnik mentions how a company imaging all the Walmart parking lots in the world for several weeks was able to build a model based on the cars and traffic patterns to predict net revenue—information that can be worth billions to hedge funds.

The challenge and opportunity of big data affect everyone in every field, he adds, from the recent Hollywood writers' strike (partly inspired by the studios' refusal to limit the contributions of AI-generated creative content) to what it ultimately means to contribute artistically and scientifically as a human.

"Everything is changing, and we're going to have to redefine the value-add that only humans can contribute," Bortnik says. "Students today have a ton of big challenges ahead of them, but they have more amazing tools and more data in real time than anyone ever thought was possible. Science is evolving, and data is the catalyst."

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We want to empower people to focus on what they feel is exciting or notable, since this broad array of experience is valuable for analyzing novel data sets.”

—EMMANUEL MASONGSONG

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A Celebration of Data

First held at UCLA in 2011, the annual DataFest competition sponsored by the American Statistical Association brings together undergraduates from schools across the U.S. to win awards and even potential recruitment by employers. Graduating senior Bruins on some of the winning teams at 2023 ASA DataFest shared why the competition—and the field—are so special.

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My biggest takeaway from DataFest was the need for creativity and storytelling when it comes to data. Even though we were all provided with the same data set, each group extracted something completely unique, yet somehow intertwined with the other groups.

—KATHY NGUYEN-LY, STATISTICS AND DATA SCIENCE, POLITICAL SCIENCE DOUBLE MAJOR

I have been very involved in the UCLA statistics community, so I was always curious about participating in DataFest, despite not having a major in the department. I firmly believe that our team's strength was the diverse perspectives we brought to problem-solving, based on our unique backgrounds. —ARMAN GHAZARYAN, BUSINESS ECONOMICS MAJOR WITH A MINOR IN STATISTICS AND DATA SCIENCE

My biggest takeaway from DataFest was that data science doesn't necessarily have to entail very complex modeling. Our team felt that modeling wouldn't answer our question, so instead we did a lot of counting and making data visualizations to illustrate our conclusions. Sometimes simpler is better! —AVANI KANUNGO, STATISTICS AND DATA SCIENCE MAJOR

As a language that cuts across cultures and nationalities, data science helps us bridge gaps in our understanding of each other and the communities in which we live. —LUCAS OPHOFF, STATISTICS AND DATA SCIENCE, POLITICAL SCIENCE DOUBLE MAJOR

With the exponential growth of data and recent developments in chat assistant AI, there is a growing demand for individuals skilled in analyzing and interpreting large data sets. I believe that people's interest in big data will certainly benefit my career, but it also means constantly learning the newest techniques to efficiently analyze and draw conclusions. —RYAN WALLACE, STATISTICS AND DATA SCIENCE MAJOR

I have enjoyed and appreciated how my major has incorporated consulting classes to better prepare us for real-life challenges in statistics and data science. On a more personal note, I have enjoyed being able to partake in a diverse community of data enthusiasts—especially at ASA DataFest! —SARAH ZHARI, STATISTICS AND DATA SCIENCE MAJOR

With the big data revolution, I am excited about the possibility of pulling data from diverse sources to solve complex, interdisciplinary problems. In particular, I believe this revolution can transform the health care industry in terms of speed, cost and insights.

—PAIGE LEE, STATISTICS AND DATA SCIENCE MAJOR, NEUROSCIENCE MINOR

Read more from these statistics and data science scholars at college.ucla.edu/magazine

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With Big Data Comes Big Responsibility

In recent years, social scientists, including UCLA's Safiya Noble (see sidebar on page 36), have raised the alarm that if we rely on big data for social and economic purposes without heavily regulating its use, we risk reinforcing inequities.

UCLA economics professor and California Policy Lab faculty director Till von Wachter, for his part, is highly attuned to the sensitive nature of the data his group works with.

Figuring out how to use highly personal data about, say, mental health treatment in a responsible, unbiased and farsighted way is a challenge that requires not just a commitment to justice but also expertise in law and data security. That complicated work is well worth it, however, with equitable research and policy as the goal.

"We've paid the fixed costs to create a legal framework, to have a highly secure IT infrastructure and to clean up the data," von Wachter says of the California Policy Lab, which has been in the headlines lately for unique data-driven studies of California's unemployment benefits system during the COVID-19 pandemic. "We also collaborate with our community advisory board for their insights on this work and we only work with anonymized data, all of which facilitates cooperation between agencies and researchers."

When it comes to big data, discussions of the science involved can sometimes get abstruse. Its impact, however, ranges from the individual to a global scale—take climate science.

Alex Hall, professor in the department of atmospheric and oceanic sciences and the Institute of the Environment and

Sustainability as well as director of the Center for Climate Science at UCLA, observes that his field was one of the first to embrace big data several decades ago. Without algorithmically assisted analyses of vast troves of data, scientists never could have developed accurate next-day weather forecasts—let alone climate models that predict conditions decades or centuries from now.

What's changed, Hall says, is the introduction of machine-learning analysis techniques. This data technology has made it possible to conduct new research, including his work on extreme precipitation events, one of the most catastrophic effects of climate change. Using artificial intelligence to detect changes in these phenomena, Hall's team tested whether leading climate model predictions of increasing precipitation extremes were accurate. They were: Storms-wise, the real world is behaving according to climate change projections.

"We're using machine learning to find pretty subtle signals that would otherwise be difficult to see," Hall says. "We're also experimenting with different ways to use AI to address the question of the distribution of wildfire risk and enable us to make skillful predictions."

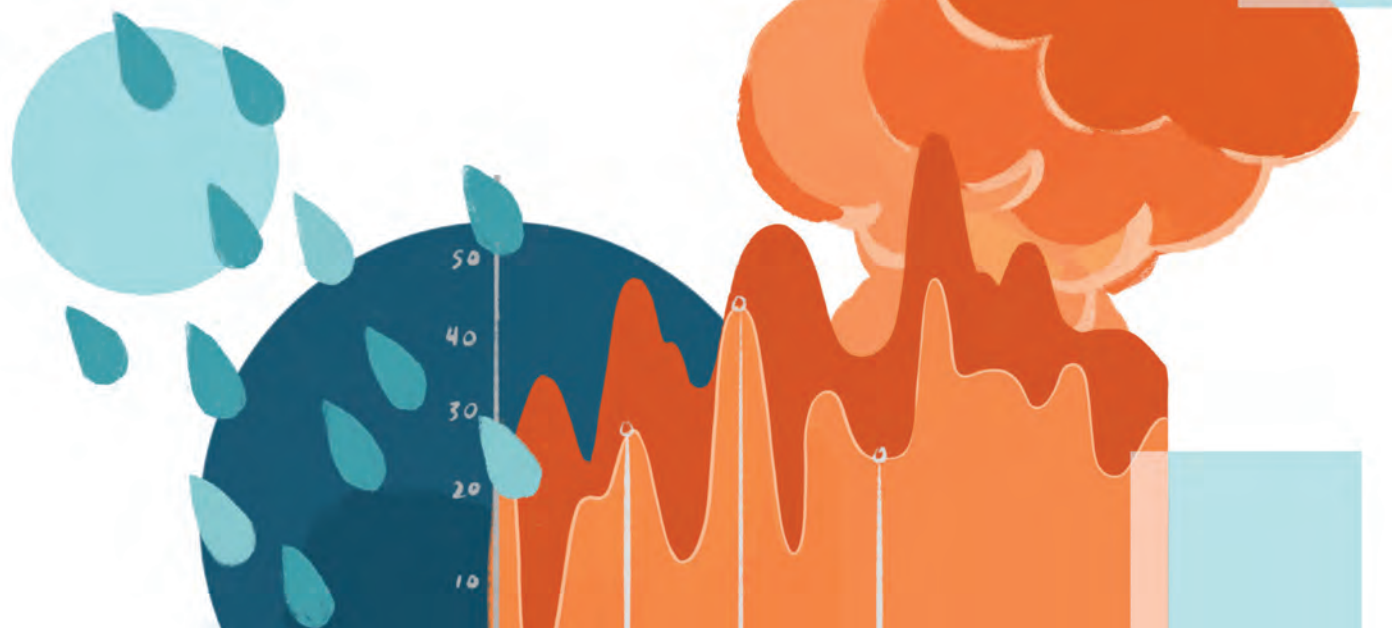
To tackle that and other research questions, Hall can count on legions of new trainees; in 2018, UCLA became the first U.S. college to offer a climate science major. After all, a grounding in climate science is synonymous with a strong education in handling big data.

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We're also experimenting with different ways to use AI to address the question of the distribution of wildfire risk and enable us to make skillful predictions.

—ALEX HALL

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Seeing the Bigger Picture

According to Juliet Williams, professor of gender studies and chair of the UCLA social science interdepartmental program, the intellectually galvanizing rallying cry in her field in recent years has been the insistence that data itself is social.

"There have been those who have heralded the advent of the age of big data as one that will enable us to transcend human bias," Williams says. "Finally, we'll have a more direct and pure access to the truth of how the world works, so that we can solve problems non-ideologically. But, of course, what has quickly been discovered is that big data as often as not mirrors the biases of the social world."

UCLA social scientists have been at the forefront of questioning big data practices in industry, government and finance, as well as generating new data science projects that serve equity and justice. One such example is the Million Dollar Hoods effort co-led by UCLA history, African American studies and urban planning professor (and MacArthur "genius grant" recipient) Kelly Lytle Hernández. Million Dollar Hoods aims to finally put an accurate price tag on mass incarceration by tracking, neighborhood by neighborhood, how much public money is spent locking up Los Angeles residents.

Professor of sociology and American Indian studies Desi Small-Rodriguez has also made headlines with her work on what she calls Indigenous "statistical erasure" through the U.S. census. Small-Rodriguez's research tells an instructive story of how state power is expressed through data collection and analysis and explores how the nations might someday achieve the goal of "data sovereignty."

One of the great promises of big data is that it can bring together previously siloed information for combined analysis by super-efficient algorithms. Ironically, however, the academic conversation around big data has itself long been siloed. Williams and her colleagues, including Darnell Hunt, UCLA's executive vice chancellor and provost and

former dean of social sciences, addressed this split with a new set of curricular offerings meant to bring data science, humanities and social science onto common ground at the UCLA College.

"We started to notice that students in fields like history, gender studies, Chicano studies and sociology had a very strong interest in social justice, but they weren't necessarily taking any statistics beyond the minimum," Williams says. "At the same time, we had lots of students in economics and political science who were getting very sophisticated quantitative and data-related training, but weren't necessarily being given the theoretical concepts, tools and frameworks to query the social origins and impacts of data."

Thus was born, in 2021, the UCLA Mellon Social Justice Curriculum, a \$5-million investment in expanded curricular offerings aiming to bridge the gap between social inquiry and data science. The grant has allowed for the hiring of five new faculty and the development of a freshman-year cluster course on data, society and social justice.

Williams, who serves as faculty co-lead for the initiative, and her colleagues are also working on a one-year data and society master's degree track and an undergraduate data justice scholarship.

"We want to make sure, as we're training 21st-century UCLA graduates, that they have the full repertoire of tools necessary to realize transformative change," Williams says. "We're recognizing that as much as you have to have fluencies in social theory, you also have to understand the basics of how statistics work. You have to be able to work with data sets, because that's increasingly the language in which public policy is being debated and formulated."

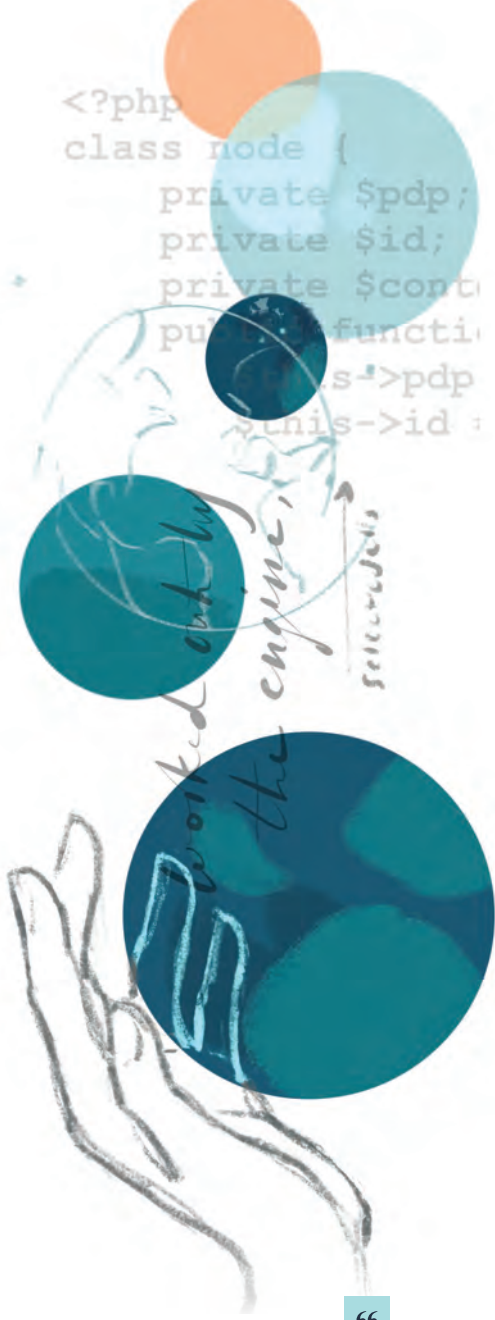


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—JULIET WILLIAMS

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It's really exciting to think about what is possible at UCLA and beyond when north and south campus collaborate.

—CHRIS JOHANSON

A Human Touch

The same is true when it comes to the intersection of big data and the humanities. In fact, Williams' Mellon faculty co-lead is Todd Presner, chair of the UCLA Department of European Languages and Transcultural Studies and special advisor to the vice chancellor for research. Presner is currently working on a book, *Ethics of the Algorithm: Computational Approaches to Holocaust History and Memory*, in which he examines the innovations made possible in the field via everything from natural language processing to machine learning to data visualizations.

These approaches have also made a difference in work tied to the ancient world, according to Chris Johanson, associate professor of classics and chair of digital humanities. For example, in aristocratic Roman funeral traditions, mourners would portray multiple generations of the deceased's most notable ancestors, both real and mythological.

Johanson's RomeLab project developed reconstructions of these funerals and, using a searchable database of all known members of Roman society's elite known as the Digital Prosopography of the Roman Republic, as well as network graph visualizations of their family trees, Johanson and his students created visualizations for every aristocratic funeral that might have occurred during the entirety of the Roman Republic.

"RomeLab is just one microscopic example of how one can work with computationally actionable data in the humanities," Johanson says. "But it shows how these tools allow students to connect closer to the people and materials of the past than they could have otherwise."

This philosophy informs the division on a broad scale. For example, John Papadopoulos, professor of classical archaeology, history and culture, has incorporated light detection and ranging (LiDAR) data to create 3D models of an Athenian agora excavation project. And Ashley Sanders Garcia, vice chair of digital humanities, has used text mining and network analysis to recover the history of Algerian women who lived between 1567 and 1837.

Another exciting project involves work being done by Jessica Cook, a doctoral candidate in English writing her dissertation on how 19th-century mnemonics and poetry informed the conceptualization of modern computing, focusing in great detail on Ada Lovelace, the world's first computer programmer. To access Lovelace's archive—most of which is unpublished—Cook had to photograph all the papers in the archive and train an AI model to read Lovelace's Victorian-era handwriting and then transcribe it.

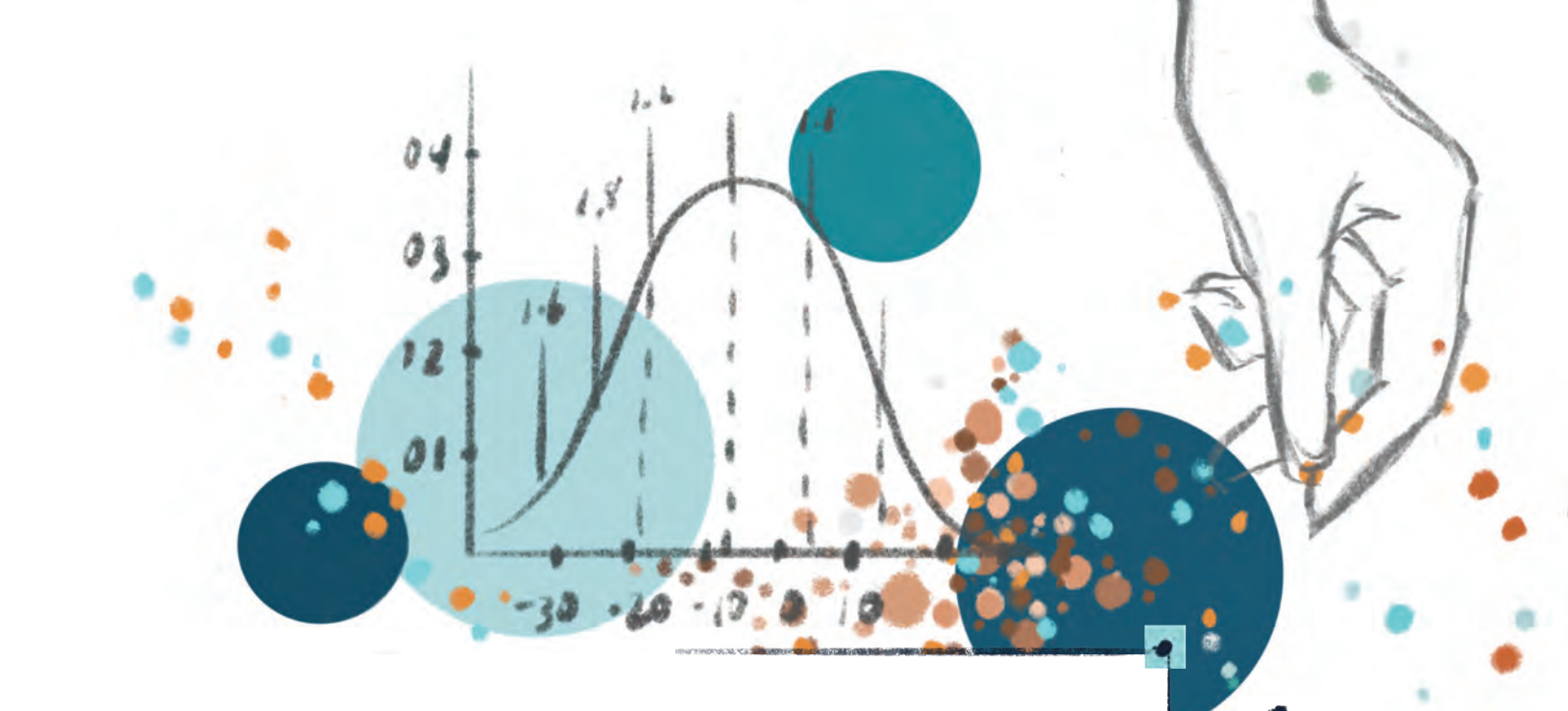
Cook's efforts have proved so successful that she is currently running her model on Lovelace's entire corpus of writing and will take similar approaches to the handwriting of Lovelace's important correspondents.

Arguably the most powerful takeaway is that this project will finally allow Lovelace's entire body of work to become accessible to researchers who can ensure she receives the rightful credit many of her male contemporaries have enjoyed for centuries.

"This kind of large-scale digital humanities endeavor is an exciting demonstration of how big data and AI have transformed the field of literary study," says Cook. "However, this particular project is especially poignant because Ada Lovelace's contributions to the history of computing were the genesis of the very AI technologies that make this research possible. If Lovelace had not produced the very pieces of writing that I am transcribing, it is possible that the modern computer as we know it may also not have existed."

Keeping the focus on humanity is key, these researchers agree.

"As much as technology has the ability to distance us from what it means to be human, it's also able to bring us much closer—to allow us to connect strands and stories of the human experience more efficiently than ever before," Johanson says. "It's really exciting to think about what is possible at UCLA and beyond when north and south campus collaborate."



Bench Science and Beyond

In the world of medical and biological research, likewise, there has been an overwhelming transformation of laboratory practices thanks to the advent of big data collection and sharing. Increasingly, biology research is done by analyzing publicly available data sets measured and deposited by any of the thousands of laboratories worldwide, says Alexander Hoffmann, professor of microbiology and immunology and founding director of the Institute for Quantitative and Computational Biosciences at UCLA.

"There is an increasing number of biologists who have never trained to hold a pipette, grow cells or stand at the lab bench," he adds. "But they are trained in computational algorithms and workflows, and they have biological knowledge. That's a huge shift in life sciences—we now have dry-lab scientists, in addition to the traditional wet-lab scientists."

Dry-lab science can indeed have a huge impact in the real world. Jingyi Jessica Li, professor of statistics, biostatistics, human genetics and computational medicine at UCLA, does work illustrative of the complex path of such lifesaving medical research in the era of big data. Li's expertise lies neither in the gathering of data from experiments nor the application of findings to medicines and therapies, but in the in-between step of deciding which algorithms are best for parsing which of the enormous data sets now available to researchers.

"My role in this whole long process is to ensure that the analysis is rigorous," says Li, "so we can give a proper confidence

level to the findings we observe so that we are not overly optimistic, or we don't miss important findings."

Recently, Li published a study that may revolutionize the way differential gene expression is examined. When scientists want to determine which genes are expressed differently by healthy and sick patients in the case of, for example, liver disease, they need a statistical algorithm to help them flag gene expressions worthy of further study.

Until recently, they've relied heavily on a statistical measure known as p-value, whose calculation, however, can be mysterious, dubious and error-prone for non-statisticians. Li's research shows that methods relying on ill-posed p-values are often deeply flawed, turn up false discoveries or miss relevant genes. Li has designed a statistical framework, known as "Clipper," that allows users to find differentially expressed genes using a new concept called contrast scores, which can be flexibly constructed using properly set up (experimental or in silico) negative control data, without relying on p-values.

Navigating these complexities in ways that are mutually intelligible to researchers working separately in dry labs around the globe is the path to achieving real medical breakthroughs in the big data era.

"How to distinguish signals from noise is the grand challenge in my field," Li says. "Statistical modeling offers a way to make data analysis more transparent and interpretable."

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How to distinguish signals from noise is the grand challenge in my field.

—JINGYI JESSICA LI

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Training the Next Generation

Li, with her research team, makes use of UCLA's leadership in the field of next-generation sequencing, a big data method for determining the sequences of DNA and RNA, often for research into genetic conditions and diseases. According to Hoffmann, UCLA has become a beacon for NGS research in part because the university excels in training young scientists in the analysis method. This is thanks largely to two projects Hoffmann oversees: the Collaboratory and the Bruins-In-Genomics (B.I.G.) Summer Research Program.

Led by molecular, cell and developmental biology professor Matteo Pellegrini and housed in UCLA's Institute for Quantitative and Computational Biosciences, the QCBio Collaboratory is a postdoctoral training program but also so much more.

"A broad UCLA community of scientists learn from the postdocs how to handle big data, how to analyze it, what the computational workflows are that are state of the art," Hoffmann says. "And when they are done taking the workshops and they apply their newfound skills to their data, they can engage the postdocs in a collaborative way for expert consulting."

This commitment to training has paid off in a big way for researchers at UCLA.

"The Collaboratory was initiated over 10 years ago, and it's had a tremendous impact," Hoffmann adds. "It's a key reason why UCLA has adopted NGS and other big data measurement approaches very, very rapidly, whereas many researchers in the field at other institutions have these data sets lying around that nobody knows what to do with. The Collaboratory has really been phenomenal in removing the bottleneck for analysis."

For UCLA, however, leadership in this field so crucial to future medical breakthroughs isn't about leaving other institutions in the dust. It's about sharing knowledge and skills to empower a diverse rising generation of scientists. That's the idea behind B.I.G. Summer, which is an eight-week summer institute in quantitative and computational biosciences that is open to applicants from UCLA and other institutions, often from underrepresented backgrounds. Successful applicants get free tuition and a living stipend to spend their summer learning and working on bioscience datasets.

"While we are pretty advanced at UCLA," Hoffmann says, "there are also lots of students, lots of talent, in other institutions that are still in the process of making that transformation."

When the next great breakthrough in curing genetic disease occurs, it will surprise no one if it happens at UCLA. But it also may well happen thanks to non-UCLA scientists who trained here for a postdoctoral year, or for a summer after graduating from a college in their home city. It may happen thanks to an applied biologist who used Li's algorithms—perhaps without Li or her colleagues even knowing it.

Such is the bold new universe of collaborative knowledge creation available thanks to big data, which is transforming so many aspects of scientific progress and of our lives. Will big data turn out to be too much for us to handle? Not at the UCLA College, where, when the data gets big, so do the solutions. [U](#)

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The QCBio Collaboratory was initiated over 10 years ago, and it's had a tremendous impact.

—ALEXANDER HOFFMANN

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A Voice for Data Justice

Professor Safiya Noble raises the alarm about big data practices that lead to big inequities



When some scholars write about the emergence of big data, they see potential for new cures, insights and beneficial social policies. Safiya Noble, a MacArthur fellow and professor of gender studies, information studies and African American studies at UCLA, is cognizant of those amazing possibilities, but she also sees great harms already taking place.

"In the big data economy that we're living in, there are thousands of data brokers buying and selling data about the public 24/7," Noble says. "And a lot of that data can often be used in discriminatory ways."

For an example, Noble points to the loan application process. It is illegal for financial institutions to ask questions about gender, race, ethnicity and similar identity markers.

"And yet, social network data can expose your race, your gender or any other protected class," Noble says. "Using that data in combination with an offer for a financial product would be discriminatory, but so many of these kinds of products just come into the marketplace without any oversight."

Recently, Noble has met with the Federal Trade Commission, Consumer Financial Protection Bureau and members of the U.S. Congress to discuss big data products that could be harmful to consumers. She has also been in dialogue with major tech firms about "How Search Engines

Reinforce Racism," the subtitle of her blockbuster 2018 book *Algorithms of Oppression*.

"There's no question that search companies like Google have studied my work and tried to address the concerns revealed through that research," Noble says. "Once the research is there, they have to contend with it, and many—but not all—do."

At UCLA, Noble recently formed a new research group, the Center on Race and Digital Justice, where she aims to shine a light on the ways data can be used to discriminatory ends and, in her words, "to advocate for the abolition of systems that are very dangerous and racially unjust in our society."

She is also involved in shaping the curriculum for UCLA undergraduates through the DataX initiative, which began in 2019 and where she took the reins in 2022. This highly interdisciplinary effort seeks to bring together everyone involved in data science at UCLA to share ideas, skills and commitment to justice and fairness in the use of data to address the most pressing issues facing society.

"If the DataX initiative is successful," Noble says, "any student going into a field that is data-intensive will leave UCLA thinking critically about the potential for social harm to communities and to individuals." 



BRUIN CONNECTIONS

Data paints a bigger picture that reveals as much about the individual as it does society as a whole, from the inspiration behind this feature's artwork to the discoveries made by doctoral candidate Jessica Cook. Read more about how she's using technology to conduct groundbreaking literary research that will reveal a more accurate and inclusive portrait of our world at college.ucla.edu/magazine

A LINGUISTICS LOVE STORY

THEIR GENEROSITY TAKES THE STUDY OF LANGUAGE TO NEW HEIGHTS

When Tom Bye graduated from UCLA with a Ph.D. in linguistics in 1976, he and now-husband David Bohne kept their celebration small—par for the course for the pair.

“When we met, we didn’t have much money, so we’d go out on Friday nights to a restaurant counter and order liver and onions—\$1.29, including a small green salad and roll,” Bohne remembers with a smile. “Neither of us much liked it, but it was the cheapest thing on the menu. Then we’d

get an inexpensive bottle of wine and talk for hours. We still haven’t run out of things to talk about.”

“Both of us are incredibly frugal,” Bye adds with a big laugh. “But it’s the reason we’re able to give it all away today.”

Among their generous gifts to support far-reaching initiatives, the couple has pledged \$2 million to the UCLA Division of Humanities to establish the Thomas J. Bye Linguistics Laboratory Program. Augmented by \$500,000 from the Humanities Division

Centennial Matching Program (made possible by the Kaplan/Panzer Humanities Endowment), the lab program will support innovative, interdisciplinary research—particularly in child language acquisition, one of Bye’s major interests.

“We are so grateful for the visionary leadership of friends like Tom Bye and David Bohne,” says Alexandra Minna Stern, dean of humanities. “Their remarkable example shines a light on our core mission.”

“Tom and David’s philanthropy has already seeded new lines of research by students and faculty,” says Megha Sundara, professor and department chair of linguistics. “And in the years to come, the Bye lab program will ensure that UCLA Linguistics continues its legacy of research and academic excellence.”

Managed by a faculty committee, the funds have already provided graduate students with summer research opportunities, enabled projects on everything from experimental pragmatics



David Bohne and Tom Bye

to phonetics, and supported graduate student participation in multiple workshops, including electroencephalography training and the California Meeting on Psycholinguistics.

"The Bye Linguistics Laboratory Program has also allowed new hires like myself to integrate into existing psycholinguistics collaborations in ways that allow us to expand and experiment," says Laurel Perkins, an assistant professor of linguistics who studies how young babies acquire the structure and meaning of their first language. "These resources have broadened the scope of the research that both our faculty and students are doing."

Bye initially began his study of linguistics because he enjoyed the challenging nature of the discipline, which inspired him to start by earning his master's from UCLA in 1972.

"I've always been fascinated by second language acquisition, partly because I spent my junior year in France and sometimes really struggled," Bye says. "So that intrigued me and helped focus my interest."

Bye also credits a mentor, Sandra Thompson, then a professor of linguistics at UCLA, for inspiring him.

"I was lucky enough to be chosen by Tom to be the chair of his dissertation committee," says Thompson. "Tom's research showed that when children give directions—say from their school to their home—they consistently assume too much knowledge on the part of their listeners; this was both an original discovery and a significant contribution to the field of psycholinguistics."

After earning his doctorate, Bye chose a linguistics-adjacent career path in the K–12 arena. When the couple moved after Bohne, a Berkeley grad, was offered a job in the Bay Area, Bye accepted a position as a civil rights consultant for a federal agency charged with helping school districts develop effective programs for English learners. He later served as a K–12 administrator and, in the 1990s, formed an education consulting firm and authored commercial English as a Second Language programs for Prentice Hall and McGraw-Hill Education.

UCLA was never far from their thoughts—in fact, Bye is a member of the dean's advisory board for the division of humanities. So when the couple started to think about their legacy, Bye fondly remembered his time as a "baby Bruin" and the satisfaction he's found ever since in the UCLA community.

"David likes to joke that I'm a meddling old coot, but I can't help it—whenever something's going on, or not going on, that I can help with, I get personally involved," Bye says. "It's fun to roll up my sleeves and contribute to UCLA in as many ways as I can."

And so he and Bohne have built vibrant, enduring relationships across the UCLA College, especially when it comes to talking linguistics shop with professors and students in the department.

"We are grateful to Tom and David and think the world of them. It's especially been a joy to get to know Tom, work with him and see how deeply he cares about the research and the people doing it at UCLA," says Jesse Harris, associate professor of linguistics, who studies how adult speakers of a language rapidly decode speech and texts. "This is more than a crucial financial gift—Tom and David's deep intellectual curiosity and engagement show an inspiring investment in the human impact of our work." 



A GENEROUS BEGINNING

I have a UCLA tumbler that says, "Discover where the humanities will take you." They have taken me on a wild adventure where I get to combine my love for languages with technology. I graduated in 2017 with a degree in linguistics; today, I'm a software engineer at Tenyx, a 10-person speech recognition startup.

At UCLA, I made lifelong friendships with professors and classmates, and was able to turn my passion for language and fascination with puzzles and pattern recognition into a career I love. I also took an Honors Collegium course that completely reshaped my world view: "Philanthropy as Civic Engagement."

In this course, we as a class were given \$100,000 provided by local donors to allocate among three Los Angeles nonprofits. We started with 50 organizations, and the nonprofit I selected, Foundation for Women Warriors, made the final three. Our class ultimately funded one of the country's first veteran-specific educational day care programs.

I wouldn't be where or who I am without UCLA, and so I began donating as an undergraduate and continue on today. It was only a few years ago I was a broke college student—I know how grateful I was for "little" things like \$250 scholarships, the Humanities Career Panel Series or free lunches at events. I also donate my time to current students; this is my third year in the UCLA Alumni Mentor Program.

Even if fiscal contributions aren't in your budget right now, you can give back to UCLA in creative ways. Never underestimate the ripple effects caused by one person doing one small, good deed!

—ANGIE HOWARD '17



Michael and Cathy Casteel '68

A GARDEN OF GENEROSITY

THE COMPASSIONATE FORESIGHT OF UCLA COLLEGE DONORS IS MAKING AN ENDURING DIFFERENCE

As a famous quote attributed to Audrey Hepburn goes: “To plant a garden is to believe in tomorrow.”

“That’s certainly how we feel about helping future generations of students—it’s like planting a garden,” says Cathy Casteel, who graduated from UCLA with a bachelor’s degree in English in 1968. “There’s no limit to what these students could accomplish or where they could go, and knowing that today we can help level the playing field and increase opportunities for tomorrow is a wonderful feeling.”

That’s why she and her husband have been such thoughtful “gardeners,” giving \$100,000 in 2016 to endow the Cathy D. and Michael A. Casteel Centennial Scholars fund for students in the department of English, augmented by a \$50,000 match

from the UCLA Centennial Scholars Match Initiative. In 2022, the couple committed \$250,000 to endow the Cathy D. and Michael A. Casteel Undergraduate Scholarship in the UCLA College Division of Undergraduate Education, with an additional \$50,000 current-use pledge to support the purpose of this scholarship.

“We are both firm believers in higher education and supporting the wonderful institutions we graduated from,” says Michael Casteel. “We want more students to have the transformative experience a place like UCLA can provide.”

The first in her family to go to college, Cathy Casteel grew up in Los Angeles and chose UCLA on the recommendation of a trusted high school English teacher. She made the most of her time on campus,

working in the UCLA bookstore to make ends meet, never missing an opportunity to explore the libraries and soaking up the culture, knowledge and excitement of a busy undergraduate experience.

Both in school and beyond, she credits her UCLA humanities education with helping her become an empathetic, engaged citizen of the world—and one who is determined to ensure that others can share similar journeys in perpetuity.

To this end, the Casteels generously expanded the impact of their scholarships by blending each with an estate gift to make the greatest impact both immediately and long term. They made a bequest of \$1 million to strengthen their undergraduate education scholarship, and they have designated their centennial scholarship in English as a beneficiary of their charitable remainder unitrust to ensure their legacy endures.

“You can’t take it with you,” Michael Casteel says with a smile, “and that has guided our giving.”

Cathy Casteel agrees.

“I’ve been so moved talking to the student recipients of our scholarships and of others—we are happy to trust Dean Adriana Galván to put this money to the best use,” she adds. “It’s very exciting to know we can help so many students reach their full potential who might not otherwise have had the chance.” [U](#)

SPACE FOR GRATITUDE

Investing in what students can and will accomplish for the benefit of all inspired Bryan Horning, who graduated from UCLA in 1975 with a Ph.D. in space physics. Concerned about the sustainability of life on Earth, he sees space exploration as key to the survival of humanity.

“There are so many questions of physics, astrophysics and planetary and space science we don’t understand yet, but we need to before we can get where we need to go in terms of finding resources on other planets,” he says. “It may take a few generations, but I believe science can lead to extraordinary solutions.”

And so he committed an irrevocable testamentary pledge of \$3.2 million to establish the Bryan L. Horning Endowed Fund in Physics and Astronomy as

well as the Bryan L. Horning Endowed Earth, Planetary, and Space Sciences Fund to support undergraduates and graduate students alike.

It's a topic that's fired his imagination his entire life—Horning grew up loving television shows like *Space Patrol* and *Rocky Jones, Space Ranger*, began writing biographies of astronomers and physicists while he was in high school, studied under the renowned planetary science professors Robert McPherron and Gerald Schubert as a doctoral student at UCLA and retired from a successful aerospace career of his own in 2012.

"UCLA gave me the opportunity to study important subjects I loved with incredible professors," Horning says. "I'm proud to give back to further the future work of students who will make the breakthroughs we as a planet still so desperately need." 

AN ARTIST'S EYE FOR THE FUTURE

Although Brooklyn-born Jules Brenner only attended UCLA for a short time, he always appreciated the experience. The university and its community made a lasting impression on him, a true Renaissance man who served in the U.S. Army and went on to work as an underwater photographer, writer, and film and mystery novel reviewer—and to make an indelible mark on the silver screen.

In Hollywood, Brenner rose through the ranks to become an acclaimed director of photography and cinematography, earning credits on a wide range of projects, including the influential Cheech & Chong film *Up in Smoke*, the modern horror classic *The Return of the Living Dead*, the Stephen King vampire miniseries *Salem's Lot* and the cult TV favorite *MacGyver*.

In 2019, he published his autobiography, fittingly titled *Shooting Stars: A Movie*

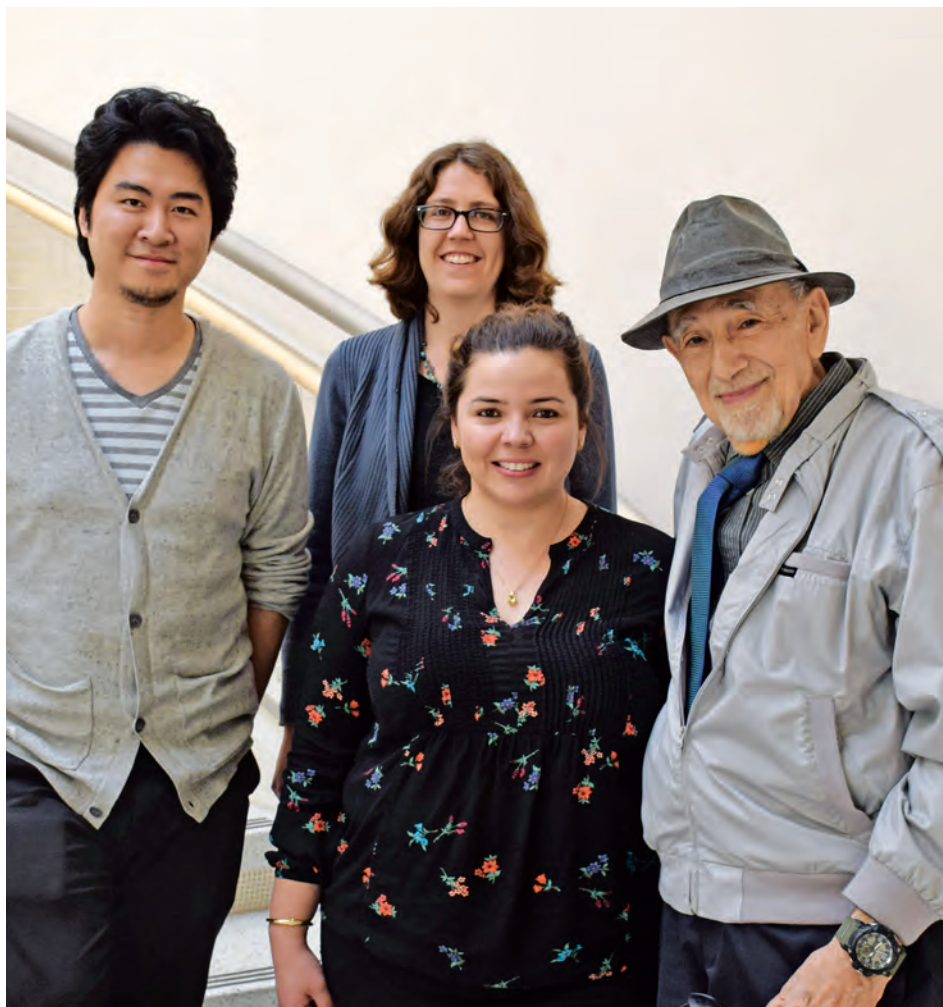
Industry Memoir, filled with countless colorful anecdotes of a life in film. On the jacket copy he highlighted a few of his most vivid memories, including how he "met (and shot) Paul Newman, got fired by Kirk Douglas, lit Donald Sutherland as Christ, got kissed by Geraldine Page and speared a fish for lunch with Cheech Marin."

Before his 2021 death, Brenner had circled back to UCLA. Inspired by the impactful work being done in the division of life sciences to further humanity's ability to cure diseases, he funded the Jules Brenner Scholar's Achievement Award in Molecular Biology and was considering making a bequest for an endowed chair. Although he died before he could finalize such an additional gift, his thoughtful planning did not go for naught.

In late 2022, the Jules Brenner Revocable Living Trust gave a \$2.13-million gift to establish the Jules Brenner Endowed Chair in Molecular, Cell and Developmental Biology, the first endowed chair in the department.

"Jules was very proud of his time at UCLA and the university's consistent leadership in cutting-edge research and scientific discovery," says Steve Oakley, the trustee. "Jules would be humbled and proud to have his name associated with the academic excellence fostered by UCLA and the department of MCDB."

The trust will also fund a \$100,000 endowed Jules Brenner Scholar's Achievement Award supporting graduate students in the Molecular Biology Institute at UCLA, ensuring that Brenner's visionary compassion continues to take deeper root—and flower—endlessly. 



Jules Brenner (right) with Jules Brenner Scholar's Achievement Awardees Lulan Wang (2016), Courtney Young (2017) and Aimee Flores (2018).

To plant your own garden, contact:

UCLA Development
(310) 794-2345
gifts@support.ucla.edu

Office of Gift Planning
(800) 737-8252
giftplanning@support.ucla.edu

**Anyone who has been directly impacted by the recent**

generation of California wildfires can't help but feel a visceral connection to our climate and the life-altering impacts of its current cataclysm. I've spent my entire life engaging with our natural landscape, appreciating its incomparable diversity, being nourished by its peerless beauty.

All those values are placed at risk now; many of our most precious assets have incinerated already. Supporting research into the nexus of climate and wildfire is simply a practical, tangible way of expressing my commitment to confront and investigate the issues in play with this crisis.

That's why I gave the gift of a postdoctoral position for UCLA's Climate and Wildfire Initiative. I am committed to UCLA's various environmental missions. To me, giving back to UCLA is just a natural way of giving back to the mountains that have given me so much. UCLA is where I learned to think. Everything that mystifies us deserves answers, and UCLA taught me how to find them, or at least how to initiate the quest.

I know there are a multitude of academic areas that are completely beyond my ken. That's an entirely good thing. A great academic institution should challenge our capacity to maintain focus. Selfishly, I confine my support to areas that are somewhat familiar to me, ones I can keep in focus, adjusting my perspective as new knowledge demands. All Bruins should be proud to support the academic missions that once excited them, and hopefully still do.

—HOLLIS LENDERKING '71

“THE SCIENCE KEEPS ME GOING.”

—Andrea Ghez



© NOBEL PRIZE OUTREACH. PHOTO: CLÉMENT MORIN

TO INFINITY AND BEYOND

When Andrea Ghez won the 2020 Nobel Prize in physics for the discovery of a supermassive black hole at the center of our galaxy, she was prevented from receiving her award in the typical fashion by a very earthbound phenomenon—the COVID-19 pandemic.

At the end of 2022, Ghez, UCLA's Lauren B. Leichtman and Arthur E. Levine Professor of Astrophysics and director

of the Galactic Center Group, was among the guests of honor celebrated at an in-person ceremony in Stockholm, Sweden, during Nobel Week.

Keeping a storied tradition alive, Ghez signed a chair at the Nobel Prize Museum and joined in the festivities, never losing sight of the curiosity that has driven her entire career.

"It amazes me every time we go to the telescope to think, 'Here is this light that we're capturing that's been on a journey for 26,000 years,'" she says. "The science keeps me going." 

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"AS A PROUD BRUIN, I AM DEEPLY HONORED

to be delivering the UCLA College keynote address for the class of 2023," says Randall Park '97, sharing memories of his journey from English major, UCLA theater innovator and UCLA UniCamp volunteer to Hollywood superstar. "In my humble opinion, there is no one better to connect with these young minds than me: a 49-year-old man who is not on social media and still listens to Wham! My hope is to inspire, uplift, encourage, stimulate and other synonyms for the word 'inspire.'" 

