UNIVERSITY OF HOUSTON

FALL/WINTER 2023

The New Space Race

As billionaires pursue other-worldly experiences, UH's space experts dive into how we are navigating a new kind of interstellar chase.

UNIVERSITY OF HOUSTON

FALL/WINTER 2023

LETTER FROM THE PRESIDENT

DEAR COUGARS AND FRIENDS,

Higher education has undoubtedly been the fuel that propels society forward. Horace Mann, a powerful advocate and pioneer of American public schools, described education as the great equalizer, the balance-wheel of the social machinery. Mann, who grew up in poverty and was largely self-taught, understood the impact of a high-quality education. He transformed the country's public-education system, espousing it as a catalyst for a better society, as a place where students from varying backgrounds should be embraced and have an education provided by well-trained teachers. While Mann's focus was on K-12 public education, it can be safely argued that his platform is what public universities stand on today.

As a public university, it's our duty to serve our community, nation and world through first-rate education, impactful research and innovations, and meaningful service. As you'll see in this issue, we're answering the call to duty by addressing some of our city and society's biggest issues and questionable ventures. For instance, does artificial intelligence pose a greater risk than benefit? Three University of Houston experts, including the director of the Bauer Human-Centered AI Lab, weigh in on page 30. And while space exploration is amping up with private industry entering the atmosphere, our pioneering space architecture graduate program is too. The program's director, Olga Bannova, discusses the feasibility of humans inhabiting space and the program's new augmented reality training on page 50.

On page 40, we uncover the intriguing history of Houston's bayous, while a UH researcher explains the potentially damaging effects of its shifting sediment. The breakthrough findings can guide policymakers, in Houston and around the world, to develop a more resilient city.

These and other captivating stories, like longtime CBS sports commentator Jim Nantz's moving tale on how UH set the trajectory for his legendary career and the profile on our work around the world, showcase the fulfilment of our purpose. At a time when people are questioning the value of a college degree, we're proving them wrong at every turn, changing lives with every step—for our students, for our community and for our world. And, to that I say, Go Coogs!

With warm regards,

Renu Khator
President, University of Houston

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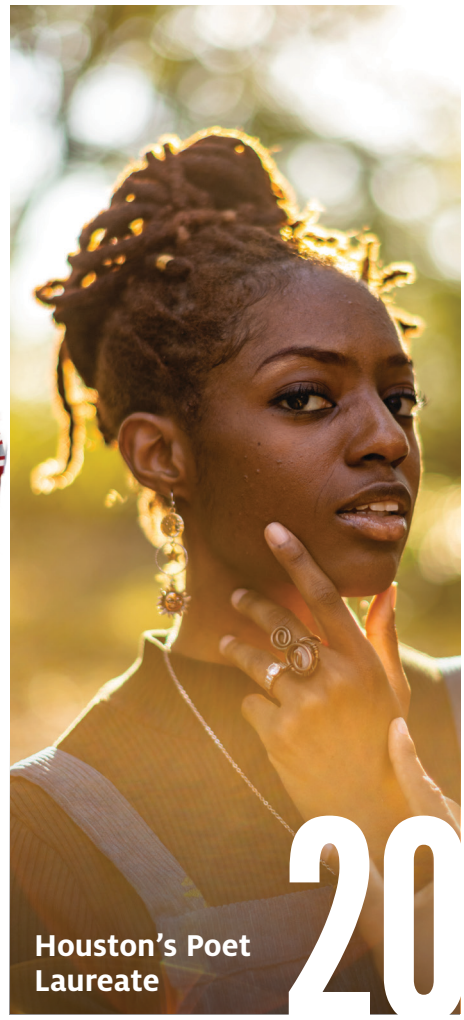

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UNIVERSITY OF HOUSTON

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THE BIG QUESTION

"What did you get your degree in, and what are you doing now?"

Spice up your daily scroll with tales of unexpected career twists and lifelong passions that were ignited at the University of Houston. We took to our official Facebook page to ask alumni the golden question: "What did you get your degree in and what do you do now?" The floodgates opened with over 2,000 Cougars sharing their academic roots and real-world exploits.

"Degree in Philosophy and work in what is basically Professional Negotiation. Logic classes set you up to be impenetrable."
William BJ Cruse ('05)

"BS in biology and then became an optometrist."
Nadia Rahman ('00, Ph.D. '05)

"Bachelor of Science in Psychology and I am a Global Mobility Consultant. I love my job!"
Kristen Burns ('11)

"I got my Bachelor of Art at UH and now I'm a ceramics professor."
Stacy Kuropata Jackson ('12)

"BS in psych with a minor in art history. I'm an attorney."
Lindsey Dionne ('06)

"World Cultures and Literature. Now I'm a recruiter."
Kaelyn Anaya ('18)

"BS in Anthropology and now I'm a public health consultant."
Lamar Polk ('05)

"BA in Political Science with a Minor in English. Currently a Tax Examiner Technician for the IRS."
Sharisse Alicia ('12)

"BBA & MBA. Now a priest. Go Coogs!"
Christopher Black Thomas ('88, MBA '04)

CAMPUS BULLETIN

HOMECOMING THROUGH THE YEARS

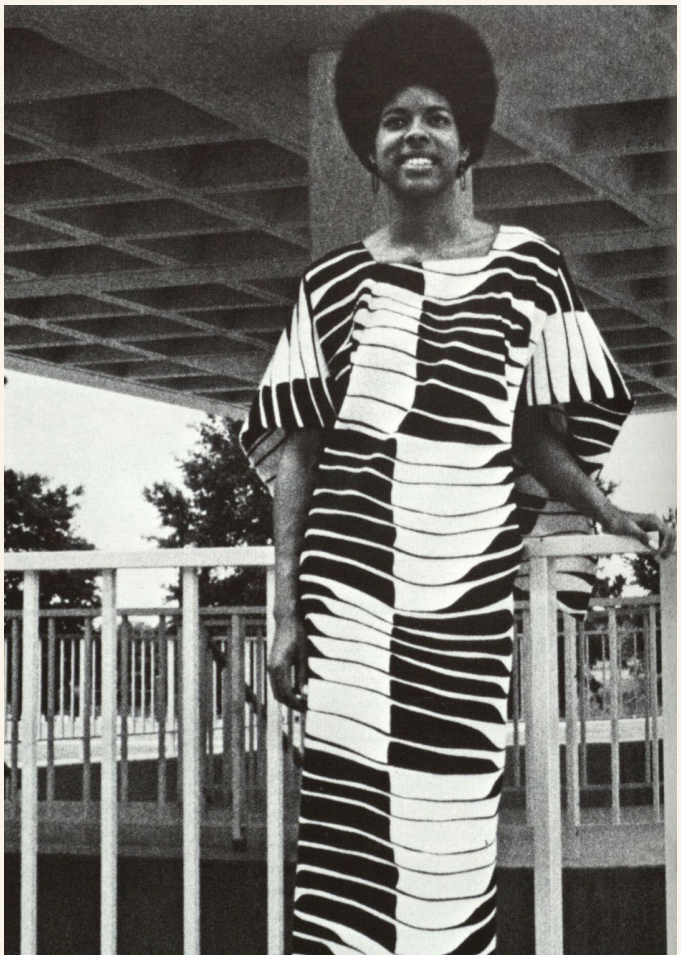
Traditions may have changed, but the Cougar Spirit remains the same.

1946

The University of Houston joins its first official intercollegiate sport conference, the Lone Star Conference, and plays its debut football game at HISD's Public School Stadium (later renamed Jeppesen Stadium) on Sept. 21. Later in the season, UH celebrates its first homecoming—dedicated to students and alumni who had served in World War II.

1950s

The homecoming heyday sees annual torchlit parades, pep rallies, street dances, downtown float competitions and a huge bonfire marking the week leading up to homecoming—and, of course, the iconic homecoming dance and crowning of the homecoming queen.



1968

Lynn Eusan is crowned the first African American homecoming queen at UH, making her the first at a predominately white university in the South. Eusan told the Houston Chronicle at the time, "This was the first time Black students on the campus have banded together and really been effective against overwhelming odds."

Seniors Jordan Booker and Jayce Ball represented UH in 2021 as Homecoming King and Queen.

2021

Seventy-five years after UH's first homecoming celebration, the event has evolved. Students now enter a variety of friendly competitions—like bed races or canstruction—a Spirit Cup competition to construct the best sculpture out of cans of food that are later donated to charity, or the talent show, Strut Your Stuff.

1996

To recognize 50 years of UH homecoming celebrations, Shasta and Sasha greet the court at halftime in bespoke crowns, and the Cougars prevail 56-49 against 20th-ranked Southern Mississippi at Robertson Stadium.

2023

Have a homecoming memory or photo you'd like to share? We'd love to see them, and so would your fellow Coogs! Send them to magazine@uh.edu.

TOPPING THE CHARTS

UH News of Note

SAVING COUGARS LOTS OF COIN

UH System Board of Regents earlier this year approved the Cougar Textbook Access Program. Projected per-semester **student savings this fall at UH could reach $5.4 million**, with a weighted average savings of a whopping $254 per student.

REVOLUTIONIZING ARMY DECISION MAKING

UH has been **awarded a $63.5 million contract** by the U.S. Department of Defense to help the Army make effective and timely decisions with a strong analytical foundation to gain dominance over adversaries today and into the future.

ROCKING SOCIAL MEDIA

By focusing on user-generated content, UH's social media has **soared from No. 70 in 2022 to No. 30** among Division I and Division II colleges and universities, according to the latest data from Rival IQ.

BIG NEW NAME

Memorial Hermann Health System stepped up their support for UH athletics and, in recognition, was awarded naming rights for UH's new Football Operations Center. The $130 million Memorial Herman Football Operations Center is **scheduled for completion in 2025**.

Colin Carr is a defenseman for the team.

COMEBACK KIDS

Celebrate the return of everyone's favorite heart-pounding, fist-pumping sport on ice.

Ironically, despite the climate, ice hockey was the University of Houston's first competitive sport.

Clearly, that fledgling team had something to prove. They showed up and showed out with an undefeated record their first season, leading their opponents with an average of 3-to-1 goals per match.

The 1941 yearbook staff called them "a fighting bunch of puck pushers."

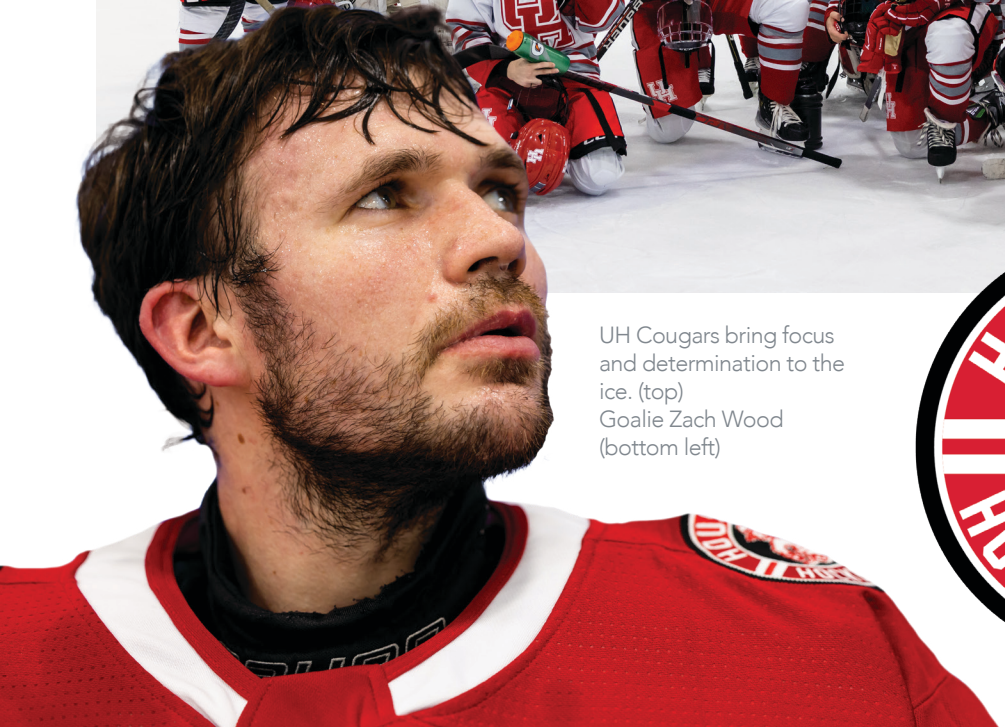
But despite the energy and finesse with which they entered the scene, the club was destined to flounder during subsequent decades—until now.

Today, the ice hockey club is making a comeback.

Keep up with the Cougars

Check out the UH Club Hockey team's schedule, purchase a team jersey and more at

houstonicehockey.com



UH Cougars bring focus and determination to the ice. (top)
Goalie Zach Wood (bottom left)

MAKING STUDENT HOUSING A HOME

Student housing introduced several wellness initiatives to help students thrive both on and off campus.

Would it surprise you to learn that the University of Houston ranks No. 3 in Texas for the number of students living on campus? Or that those students who choose to reside on campus not only enjoy an enriched college experience but also often graduate on time with stellar GPAs, outpacing their off-campus peers?

Living on campus isn't just about having a roof over your head. It's about networking with other students in specially designed pods, connecting directly with professors through the faculty-in-residence program and even accessing a student tutor right in your neighborhood. Student housing is the heart of a higher-education campus. It's what makes college feel like home.

With that in mind, UH is striving to make that living experience the best—and healthiest—it can be.

Student Housing & Residential Life (SHRL) is on a mission to redefine student living by bringing on board five dedicated professionals. Their aim? To ensure every student feels a deep sense of belonging, experiences holistic wellness and achieves monumental success. SHRL is joining forces with the Dean of Students office, Counseling and Psychological Services and University Health & Wellness to directly support residential students through new programming and one-on-one conversations.

A second initiative promises to entice students deeper into the heart of campus activities and student organizations and increase weekend and evening event opportunities. Led by a cadre of "Involvement Experts," this action plan focuses on connecting residents with opportunities and creating pathways for involvement.

HOUSTON
COUGARS

TURNING PINOTS INTO PROFITS

How the University of Houston is redefining the next generation of hospitality majors with a first-of-its-kind course in the Upper Gulf Coast region.

By Gabrielle Cottraux

Did you know?

The Conrad N. Hilton College of Global Hospitality Leadership is home to a state-of-the-art beverage lab. It is the only facility of its kind between the U.S. coasts. In fact, only a few universities in the country have dedicated facilities to research and evaluate wine.

The Spec's Beverage & Food Appreciation Laboratory provides Beverage Management students the perfect environment to expand their knowledge and expertise in this booming industry, which has become the fastest-growing and most lucrative sector in the hospitality industry.

Upsell, upsell, upsell. It's the first thing you learn in any job within the service industry, but the art of successfully getting diners to splurge on a bottle of wine is *hardly* a science. That is, unless you're a hospitality major at the University of Houston.

Led by Texas wine sales expert Chris Taylor, "Wine Appreciation" is a three-credit course offered exclusively to students 21 and older in the University's Conrad N. Hilton College of Global Hospitality Leadership. The class is the first of its kind in the greater Houston area to fuse chemistry and cabernet, turning students into experts on all things viniculture.

But students aren't in class to make wine. Instead, Taylor, the sole instructor and director of the Beverage Management Program and Fred Parks Wine Cellar, puts students in the lab where they discover global grape varietals, the styles of wine they create and the principles behind creating an elite food and wine pairing.

The course title is a bit tongue-in-cheek. While students don't get the opportunity to consume these wines in class, they do gain a comprehensive understanding of the ins and outs of the wine industry that will later allow them to appreciate their profits working in the hospitality sector.

See, the industry standard for profit margins of wine at restaurants and bars is around 70%, making it one of the most profitable offerings on the menu (yes, even above beer!). But right now, we're living in an age where just 26% of 18- to 39-year-olds identify as regular wine drinkers.

As evidenced by Taylor's 30-year career in the wine industry, beverage is one of the most important profit centers in hospitality. Between Millennials and Gen Z-ers, there's still a largely untapped demographic of potential wine enthusiasts out there, especially considering that Texas is already the second most visited wine region in the United States.

By helping students understand wine—arguably one of the most difficult and, in Taylor's words, pretentious beverages—he's priming his students to not only be the leading authorities on wine service but also to grow wine profits within the hospitality industry right here in the Lone Star state.

The course isn't just a practical decision for hospitality majors. As Texas Hill Country and its surrounding areas like Houston continue to boom with vino ventures, it promises to be a lucrative one, too.

One *class* is never enough!

Much like a fine dining experience, the University of Houston's hospitality students aren't satisfied with just one Wine Appreciation course.

Following high demand from his former students, Taylor will offer a second wine education class beginning in spring 2024. Global Wine Immersion expands upon the skills students learned in the introductory course. To qualify, students must have received a 'B' grade or above in Wine Appreciation.

Beyond wine pairing and selling skills, Global Wine Immersion students will learn how to store wine properly, understand the social responsibilities of wine service and get better acquainted with the properties of wine, like their region, suitability for aging or drinking, and possible faults.

Chris Taylor, associate professor and director of the Beverage Management Program and Fred Parks Wine Cellar.

THE FUTURE OF WEARABLE TECH

A sci-fi enthusiast makes her vision a reality.

Haleh Ardebili, Bill D. Cook Professor, department of mechanical engineering, "envisioned a science-fiction-esque future," one where not only people's phones and wristwatches were "smart," but also their clothes.

Spacesuits, uniforms, exercise clothes … "It seemed a natural next step," she says.

But for that to work, they'd have to be powered by the right kind of battery—one that's, well, stretchy.

Enter the first fabric-based lithium-ion battery. Ardebili and her team have created the first successful prototype after a breakthrough innovation: using conductive silver fabric as a platform and current collector.

This innovation will make batteries safer, since it won't require highly flammable liquid electrolytes, and will be much more conducive to bending, stretching and contorting.

At press time, the team is evaluating the commercial viability of the fabric-based lithium-ion battery as they optimize their prototype.

TWENTY-ONE STEPS FORWARD AND NO TURNING BACK

With a focus on academic accessibility, the University of Houston soars in the rankings of national universities—within striking distance of a top 50 spot on the list.

By Gabrielle Cottraux

UH RANKED

NO. 70

AMONG ALL U.S. PUBLIC UNIVERSITIES

AVERAGE SIX-YEAR GRADUATION RATE

↑ 16%

SINCE 2013

AS OF FALL 2022:

41% OF STUDENTS

RECEIVED PELL GRANTS

45% OF STUDENTS

1ST IN FAMILY TO ATTEND COLLEGE

In September, U.S. News & World Report published its annual list of 2024 Best Universities, ranking UH No. 70 overall among all U.S. public universities.

The report renders the Cougars as one of the fastest moving institutions. For context, the University earned the list's 91st spot last year.

It's a massive leap to be sure, but it's not the University's most impressive data point to come from the list. Back in 2013, the institution set out to boost its six-year graduation rates which, according to the publication, are now exceeding expectations. Over the last decade, UH's average six-year graduation rate has increased by 16%.

UH's strategy for success can be attributed to the institution's focus on not only making higher education more accessible to first-generation and at-risk students but doing a better job than other universities in making sure these students are successful.

As of Fall 2022, nearly 41% of the University's student body received Pell Grants, and this year, more than 45% identified as the first in their family to attend college. By investing in additional resources for these two demographics, whose numbers often fall behind the curve, UH's graduation rates for at-risk students are now on par with the average rate for all students.

"This significant leap underscores the excellence ingrained in everything we do at UH. We're committed to fostering an environment where dreams are realized and lives are transformed," says Diane Z. Chase, senior vice president for academic affairs and provost. "This recognition reflects our commitment to quality education and the transformative experiences we offer our students."

UH will not rest on its laurels anytime soon.

UH President Renu Khator indicates that while this massive jump is something to be celebrated, UH still has 20 more steps to go in securing a place among the nation's top 50 public universities.

"We haven't reached our apex, but we are getting better," Khator says. "It will not be easy, but our vision is clear, and we will continue to make our university better each day."

The University's motto underscores its ongoing commitment to supporting students and clinching that Top 50 spot: *In Tempore*. In time.

University of Houston students had the opportunity to work side-by-side with environmental and medical experts while traveling abroad.

EXPANDING HORIZONS

Summer study abroad programs give students a whole new perspective.

Sometimes, to solve a problem, you must look at it from a different angle. Or, from a completely different part of the world. That's what a cohort of University of Houston students discovered this summer as they scattered across the globe to tackle some of the world's biggest problems.

GALAPAGO!

A team of 26 students and four faculty members ventured out to San Cristóbal Island, the easternmost island in the Galápagos archipelago, to spend a month conducting research with scientists from around the world at the international research hub, Galápagos Science Center.

The trip was designed to foster both professional and personal growth. Field work included miles-long hikes across beaches, cliffs and lava rocks to find the elusive Galápagos lava gull, the rarest gull in the world with only 300-600 still in existence. Equally important: immersing themselves in the local culture and hearing the locals' perspectives on their changing environment.

HEALING HANDS

Ten first-year medical students from the University's Tilman J. Fertitta Family College of Medicine spent a week in Honduras, where roughly 80% of the population is without access to quality health care.

In addition to hands-on field experience, the trip gave students first-hand insights into how limited health care services and coverage affect under-resourced communities.

They worked closely with patients in the clinic and even accompanied faculty physicians on house calls throughout the village. One, in particular, involved a mile-and-a-half hike into the mountains.

"I think this experience reminded them of their purpose and why they're here," says the college's founding dean Dr. Stephen Spann. "It's something they'll remember the rest of their lives."

Fulbright & Gilman Scholars

UH's global learning opportunities are supported by prestigious scholarships, including the U.S. Fulbright Program and the U.S. Department of State's Benjamin A. Gilman International Scholarship Program. These programs foster meaningful cultural exchanges between locals and the students representing UH and the U.S. This year, eight students became Fulbright Scholars and 19 became Gilman Scholars.

DEPARTMENTS ›

HOUSTON'S HIDDEN GEMS

Architecture professor discusses Houston's little-known but most interesting buildings.

By Peter Simek

One can trace the history and character of a city through its buildings. Although Houston was founded in the 19th century, it rose to prominence during the 20th century when it became the hub of Texas' shipping and oil industry. We asked Stephen Fox, lecturer at the Gerald D. Hines College of Architecture and Design at the University of Houston, to select a few buildings he believes best reflect the dynamic story of this city once dubbed "the golden buckle of the sunbelt."

SHAMROCK HOTEL

Perhaps fitting for a forward-looking city, one of the buildings Fox highlighted is no longer standing. When it opened in 1949, the 18-story Wyatt C. Hedrick-designed Shamrock was the largest hotel in the United States. "It seemed to be the kind of embodiment of this exuberance at the time," Fox says. "It was both conservative but also had a slightly outrageous sense of architectural style."

A vintage welcome brochure from the Shamrock Hotel, the nation's largest hotel when it opened in 1949.

THE MUSEUM OF FINE ARTS, HOUSTON

By the 1960s and 1970s, Houston's civic patrons and boosters began looking outwards for inspiration and recognition. For the city's new art museum, completed in 1974, they tapped one of the most renowned architects at the time, Ludwig Mies van der Rohe. A pioneer of a modern architectural style defined by steel and plate glass, his elegant museum would foreshadow the emergence of Houston's mirrored skyline. "Mies inspired a whole generation of Houston architects," Fox says.

PROJECT ROW HOUSES

The tiny "shotgun" row houses in Houston's Third Ward exemplify the kind of workforce housing that defined the city's poor, segregated neighborhoods. But in the 1990s, artist Rick Lowe sought to transform a block of these homes to showcase the role they played in fostering strength and community. "Rather than disdain this working-class culture, Rick Lowe understood the power of those very modest and humble buildings to become a sort of icon that has emerged as a model of popularly based cultural institutions in American cities," Fox says.

BUFFALO BAYOU PARK CISTERN

Once an industrial building situated in a neglected cavern, the Buffalo Bayou Park Cistern has been preserved and transformed into a site for art installations. The transformation makes the cistern unique in that it shows, through architecture, the evolution of a city and its relationship to both public space and the natural world. "It was a building complex not constructed for public access and is technically obsolete, but it lends itself to incredibly exciting new opportunities and interpretations," Fox says.

Once disdained for being synonymous with the city's poor, Houston's Third Ward is receiving fresh appreciation, thanks to artist Rick Lowe.

HELPING HOUSTONIANS FIND THEIR voice

UH alumna Aris Kian is strengthening the community through the principles of poetry.

By Ania Hodges

At 26 years old, Aris Kian is Houston's youngest poet laureate and an ambassador for the city's culture and diversity. Here, Kian discusses the connective power of poetry and language and how she hopes to inspire Houstonians to use their voices to spark change, advocate for their needs and shape a new reality.

HOW HAS POETRY INFLUENCED YOUR COMMUNITY ORGANIZING?
In 2018, I joined CoogSlam on campus, and it was a lovely, brilliant space where community members and students gathered once a month to do open mics and slams. Through that space, we were sharing our story and community, showing up and speaking out. That level of bringing people together, hearing their stories and advocating for the individual and collective voice taught me so much about community organizing.

HOW DOES LANGUAGE STRENGTHEN A COMMUNITY?

So much of participating in this world is knowing you have the agency to do so, and poetry spaces advocate for that literally using language. Language is what allows people to feel compelled to express themselves, and not only to say, "This is how I feel," but also, "This is what I want," "This is what I dream," "This is what I imagine."

Language is one of the tools we have to communicate how we want to show up in this world, how we want the world to show up for us [and] how we want to show up for one another. This means so much to me, especially for young people who are just figuring out what they want and being able to advocate for themselves.

HOW DO YOU TAP INTO THE DIVERSE VOICES OF THE CITY?

Houston is very siloed—people are split by highways and segregated into neighborhoods—so, by design, it's easy for communities' collective power to be diminished. When I think about the spaces that I wish to cultivate, I think of multi-generational, -cultural, -lingual spaces that ensure accessibility for all so we can collectively think about what we need to thrive as a community, address individual issue areas, find the ones that overlap and seek greater understanding. One of the best ways to do that is by gathering over the art of language, expression and communication.

WHAT THREE THINGS DO YOU WISH TO ACHIEVE DURING YOUR TWO-YEAR TERM AS POET LAUREATE?

My long-term goal is to put on a full-scale multilingual, interdisciplinary art and poetry exhibition that thinks through power structures and Afrofuturism in Houston. I also want to introduce multilingual poems to different Houston libraries, workshops and community organizations that can appeal to and serve multilingual audiences. Thirdly, I'd like to spread the good word of abolition through poetry.

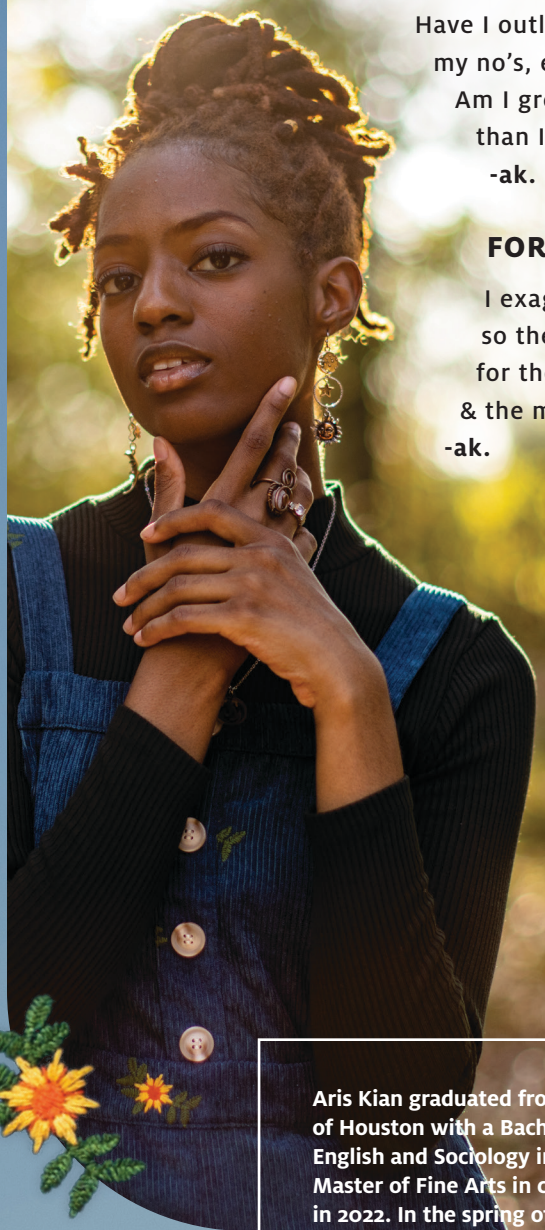
my words

QUESTIONS pt. 6

How do I like
to be held?
Who would I be
with an abundance of time?
Have I outlined
my no's, even to myself?
Am I greater
than I can imagine?
-ak.

FORESIGHT

I exaggerate my dreams
so they're big enough
for the both of us—me,
& the me I will become.
-ak.



Aris Kian graduated from the University of Houston with a Bachelor of Arts in English and Sociology in 2019 and a Master of Fine Arts in creative writing in 2022. In the spring of 2023, Mayor Sylvester Turner awarded her the title of poet laureate, the youngest ever in the City of Houston. Kian is also a digital content strategist for Code BLK and a narrative change and media manager for Houston in Action.

UNCOVERING FREUD, THE COLLECTOR

Classics professor's research changes what we know about the father of psychoanalysis.

By Tyler Hicks

As an undergraduate, Richard Armstrong read several of the Great Books of the Western World. While he revered Plato's "The Republic," one favorite stood out: "The Interpretation of Dreams" by Sigmund Freud. Armstrong was intrigued by his revolutionary thinking that still makes Freud the topic of conversation and debate, but Armstrong was even more interested in another aspect of the classic work.

"I was struck by how often Freud mentioned the ancient world," he says. "In the dreams book, he references how there's an ancient theory that dreams have meaning."

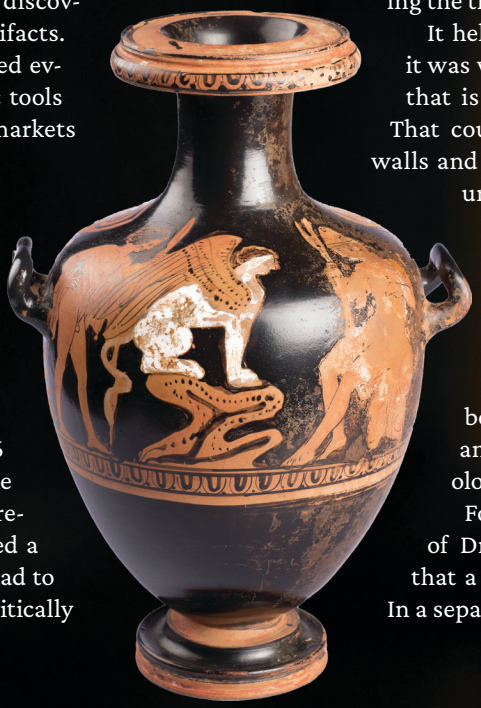
The future professor did some research and discovered Freud was an avid collector of ancient artifacts. He amassed his vast collection, which included everything from statues and busts to Neolithic tools and Egyptian mummy bandages, by visiting markets in Vienna, Salzburg, Florence and Rome.

"He was very interested in archaeology and sociology and anthropology, and I was fascinated by how those interests could have influenced his work," Armstrong adds. "Those things stayed with me for a while."

Armstrong is now an associate professor of classical studies at the University of Houston, and his interest in Freud's collection has only intensified. Following the publication of his 2006 book "A Compulsion for Antiquity: Freud and the Ancient World," Armstrong met fellow Freud researchers from London and Israel. They formed a collaborative network that would ultimately lead to "Freud's Antiquity: Object, Idea, Desire," a critically acclaimed exhibition that ran for five months earlier this year at the Freud Museum in London.

The museum is in the same Hampstead home in which the Freud family settled after being chased out of Austria by the Nazis. With help from Marie Bonaparte, the great grandniece of Napoleon, Freud's collection also made it to London. Eighty-five years later, the books and artifacts represent what Armstrong calls "a very dynamic period" in Freud's life. Specifically, the professor and his colleagues curated an objects-based exhibition that focuses on six distinct periods in the development of Freud's thought from the 1880s to the 1930s. The display also included a robust multimedia component, which featured videos, podcasts, photos of rare objects and a bibliography of suggested reading.

"This is the first exhibit in a while that looks at his collections, and it can be overwhelming, so we took a minimalist approach. We took a few items and paired them with moments of his development that help [the visitor] see what he was thinking while he was becoming the thinker we know today."



It helps that Freud's study remains as it was when he died, including his couch that is now synonymous with therapy. That couch is surrounded by book-lined walls and ancient statuettes, as well as figurines and tools from Freud's various hunts and connections. On the museum's second floor, artifacts are matched with key statements or memorable pieces from Freud's work. The result is a new understanding of both Freud's thought development and the close links between archaeology and psychoanalysis.

For instance, in "The Interpretation of Dreams," Freud presents a theory that a dream is an extension of a wish. In a separate letter reviewed by Armstrong

ANTIQUE PHOTOS © FREUD MUSEUM LONDON

and his team, Freud wishes he still had possession of a vase once special to him. Therefore, in an object-based discussion of Freud's thoughts on dreams, the curatorial team included an Estruscan pot: a symbol of the vase Freud wished he still had. That selection by Armstrong and his colleagues is emblematic of the exhibit's broader thesis. As Freud saw it, archaeology and psychoanalysis are both forms of excavation that, over time, reveal more and more about who people are and who they've been. He made this comparison even clearer in his "Interpretation of Dreams," the book that first ignited Armstrong's interest in Freud's thinking.

"I arrived at a procedure which I later elevated to a method," Freud wrote in the book. "The procedure of clearing away, layer by layer, the pathogenic psychical material, which we like to compare with the technique of excavating a buried city."

This unique exhibition lives on in the detailed digital complement curated by Armstrong and his colleagues, and the UH professor plans to continue his excavation of Freud's thinking. He is currently finishing a monograph on theory and theatricality, which will explore the resurgence of ancient drama popular on theatre stages in the late 19th century—and fueled Freud's interest in the story of Oedipus. He also has ideas for future exhibits, including one that focuses on Freud's interest in anthropology.

"Freud was deeply interested in the persistence of the past, which is a core tenet of psychoanalysis and archaeology," he says. "Archaeology is a pledge that antiquity is real. Here it is, with us."

UH'S PIXEL PICASSO

How many Lego bricks would it take to build the blaster from 'Blade Runner'? Ask this guy.

By Peter Simek

Behind Gregory Jonason's desk in his Houston home sit rows of neatly stacked Tupperware boxes, each precisely labeled and crammed with small Ziploc bags filled with brightly colored Lego bricks. These aren't his children's toy storage bins, but rather a carefully assembled collection of modular blocks Jonason uses for his art.

Jonason has created a 6-foot-tall portrait of David Bowie out of Lego bricks as well as a pixelated portrait of Martin Luther King Jr. These stunning Lego creations are now sought after by collectors and have received extensive media coverage.

Jonason, who earned both his Master of Education and Doctor of Education at the University of Houston and is currently an enterprise systems application developer at the University, says his love of working with Lego dates back to his childhood. But it wasn't until he had a son that he rediscovered the medium.

When he began looking for his own Lego sets to build, he found a community of adult Lego aficionados called AFOLs—or adult fans of Lego—who took Lego-making to the next level. They traded Lego bricks through the website BrickLink. Reconstructed classic sets completely out of stray parts. And built their own original creations. Jonason was hooked.

Jonason began sourcing Lego bricks by the pound, using software to design and engineer his creations, and drafting original directions so his own creations can be remade and replicated.

"I wasn't buying sets," he says. "I'm a little different in that I like to pay my mortgage and have a happy wife and family. Lego is actually pretty expensive. I buy people's bulk collections off Facebook marketplace or Craigslist, meet up with them and get a huge tub of their childhood Lego or their kid's Lego they're cleaning out."

This kind of creative, meticulous work perfectly suited Jonason's multifaceted interest in art, engineering and computer science.

Jonason first arrived at the University in the early 2000s after starting his career working for startup companies during the dot-com boom. Throughout his 20-plus-year career with UH, he earned two graduate degrees while helping to shepherd the University's IT and e-learning systems through two decades of rapid technological advancement. He currently assists with developing the software that will help run all the point-of-sale applications on campus.

While Jonason's behind-the-scenes work has helped the University keep pace with monumental technological shifts, his Lego creations have helped him step into the spotlight. Some of Jonason's pieces have sold at auction. Others have been commissioned for locations around the city.

He is currently at work on his largest piece to date: a replica of a well-known Houston mural by the graffiti artist Gonzo247. To execute the 16-by-3-foot Lego mosaic, he is collaborating with a few other AFOLs on the build. The toughest challenge, he says, is creating a design that can stay together despite its weight—and without using glue.

For any casual Lego fan, the scale and ambition of the piece is mind-boggling. But like the rest of us, Jonason will get there the only way one can: one brick at a time.

"It's kind of meditative to do repetitive tasks that most people find boring," Jonason says of his Lego love. "It calms my mind."

Gregory Jonason received his Master of Education and Doctor of Education from the University of Houston. He has worked at the University for more than 25 years and is currently an enterprise systems application developer.

THE ART OF SAYING NO

Professor Vanessa Patrick's research shows that an empowered refusal allows us to live more authentically.

By Shawn Shinneman

Professor Vanessa Patrick has studied self-regulation for years, seeking to understand why we make the decisions we do. Somewhere along the way, she realized these decisions ultimately boil down to saying yes or no. Her research went down a new path, resulting in her book, "The Power of Saying No." She discusses her findings here.

WHAT DO WE STAND TO GAIN WHEN WE LEARN TO SAY NO?

The bottom line is everything is a tradeoff. When we say yes to one thing, we are saying no to something else. When we learn to say no, we learn to live more authentically. We learn to live and make choices that are much more aligned with what we care about, what we find meaningful and what gives us joy and happiness. And more importantly, it doesn't make us grumpy or resentful to the asker.

WHAT COMPELS PEOPLE TO SAY YES WHEN THEY'D PREFER TO SAY NO?

The reasons are threefold. One is that we care about our relationships with other people. We want to have friends—we want to be included. The second is that we are concerned about our reputation. And the third reason is that we never really learn. We are born with the ability to say no—toddlers are great at saying no—but then it's socialized out of us, and we never regain that ability.

IN YOUR BOOK, YOU TALK ABOUT "EMPOWERED REFUSAL." WHAT IS THAT?

Instead of saying, "I can't eat chocolate cake, I can't eat bread, or I can't eat pasta," say, "I don't eat chocolate cake, I don't eat bread, I don't eat pasta."

As soon as you say, "I can't," it sounds as if there's some external force stopping you from doing it, and in other circumstances, you would do it, which comes across as much less internally motivated. You get much more pushback from other people. When you say, "I don't," our research shows that it implicates our identity. It says that this is who I am—it's a long-term and stable stance.

By switching the language, you come across as much more empowered and self-persuasive.

WHAT ELSE DID YOU FIND INTERESTING IN YOUR RESEARCH?

I found that "no" is a gendered issue. There's systemic pressure on women to say yes, and women succumb to saying yes more than men do. So, I think it's important that women, in particular, recognize and build this skill of empowered refusal so that they can do stuff that's more aligned with their purpose.

> "By switching the language, you come across as much more empowered and self-persuasive."

Vanessa Patrick is the associate dean for research and professor of marketing for the University of Houston's C. T. Bauer College of Business. She also served as Fulbright Specialist from 2019-22 and is currently the lead faculty for the Bauer Executive Women in Leadership Program.

NEXT SEMESTER'S SURVIVAL GUIDE

10 tips from Cougar alums to help the next generation of students thrive.

Get a bike. It's far and away your best transportation option. Unlike a car, you don't need gas, driver's insurance or, best of all, a parking pass!

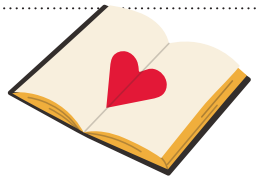
Clint Kirchhoff ('16)

Write down your deadlines for assignments as soon as you get your syllabus.

Brenda Berber ('13)

Don't compare yourself to the intelligence of others. You're talented in your own unique way, and you made it this far for a reason. Don't doubt your skills because you think a lot of people are "smarter" than you. Make good friends and ask for help if you need it. Your mental and physical health will carry you far if you take care of that. Best of luck and Go Coogs! :D

Ramón Sabillón ('14)



Pick a major that you like; don't go in for money or because "everyone else is doing it."

Umer Hasan ('14)

RUB SHASTA'S PAW FOR LUCK BEFORE FINALS.

Ludivina C. Gabriel ('17)

Enjoy being around people you know and like often. It's a special and unique time you won't get again.

Blaine Rogers ('17)

Communicate with your teachers! Don't be afraid of being in touch with them and ask for help if you need it.

Cecilia Duarte ('18, M.A. '20)

KNOCK OUT THE RESEARCH PAPERS EARLY.

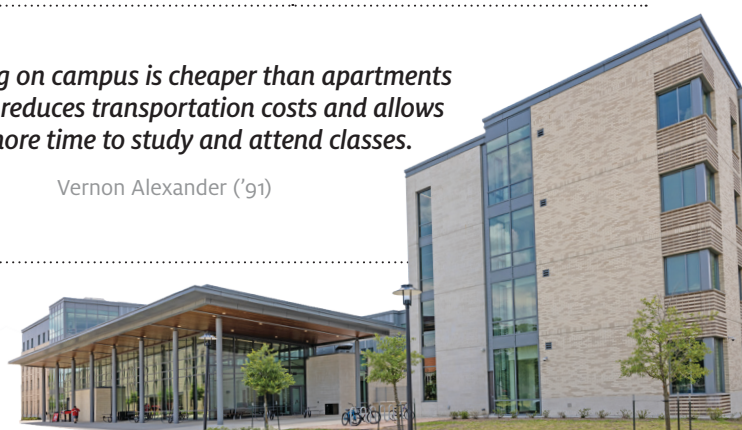
Ron Burke ('98)

JOIN A SORORITY YOUR SECOND SEMESTER, NOT FIRST.

Lorie Alcazar ('14)

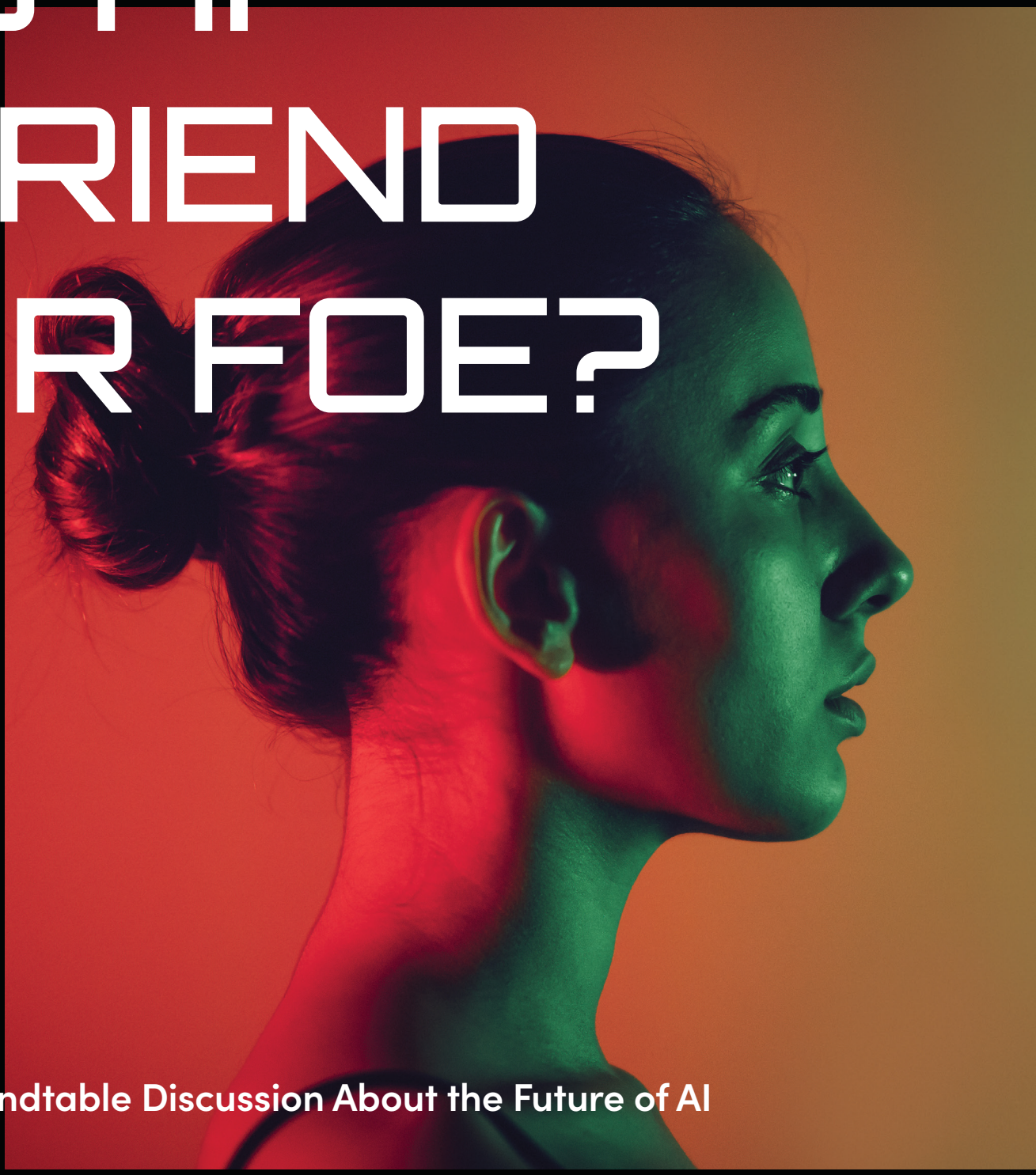
Living on campus is cheaper than apartments and reduces transportation costs and allows more time to study and attend classes.

Vernon Alexander ('91)



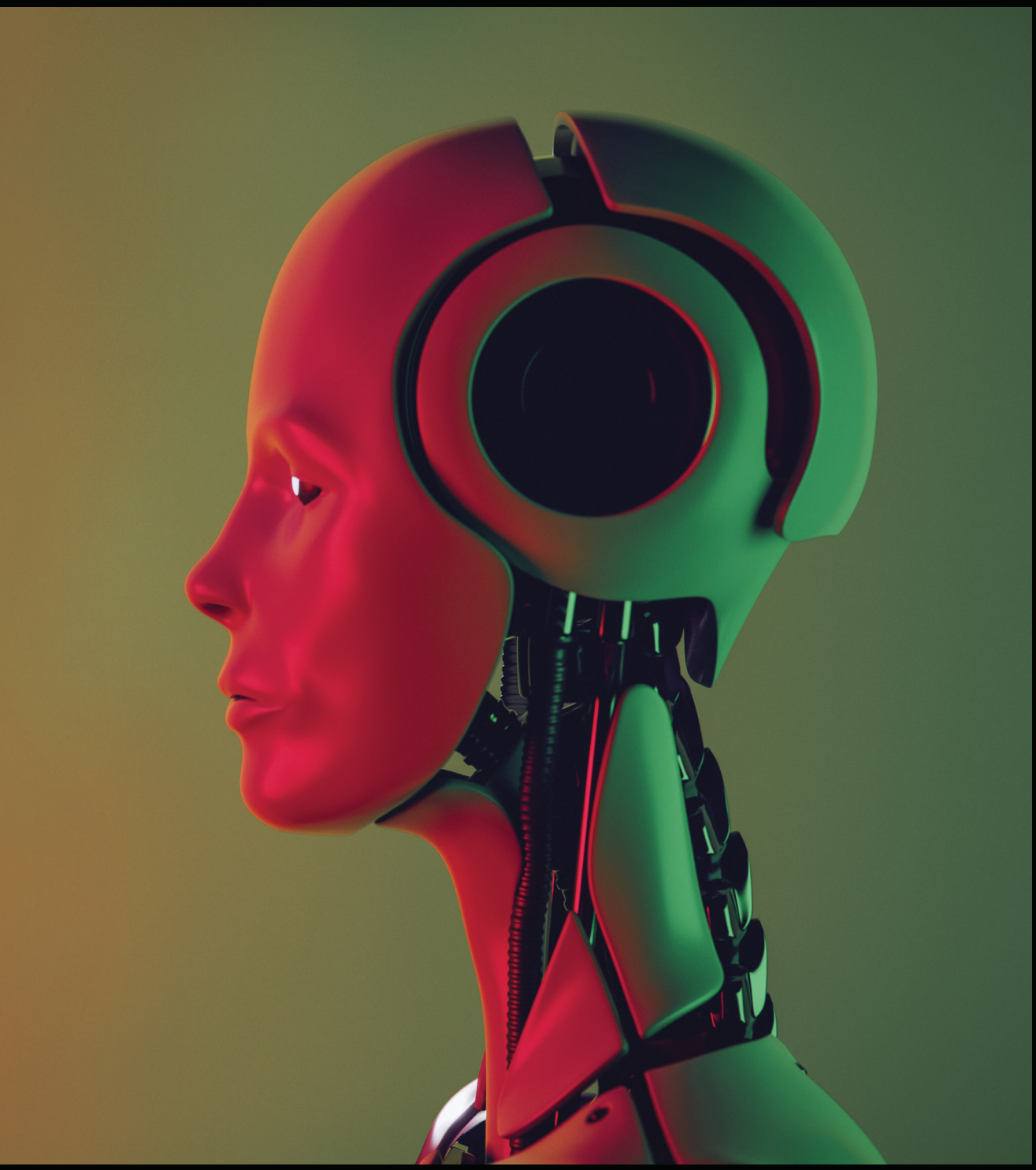
FEATURES

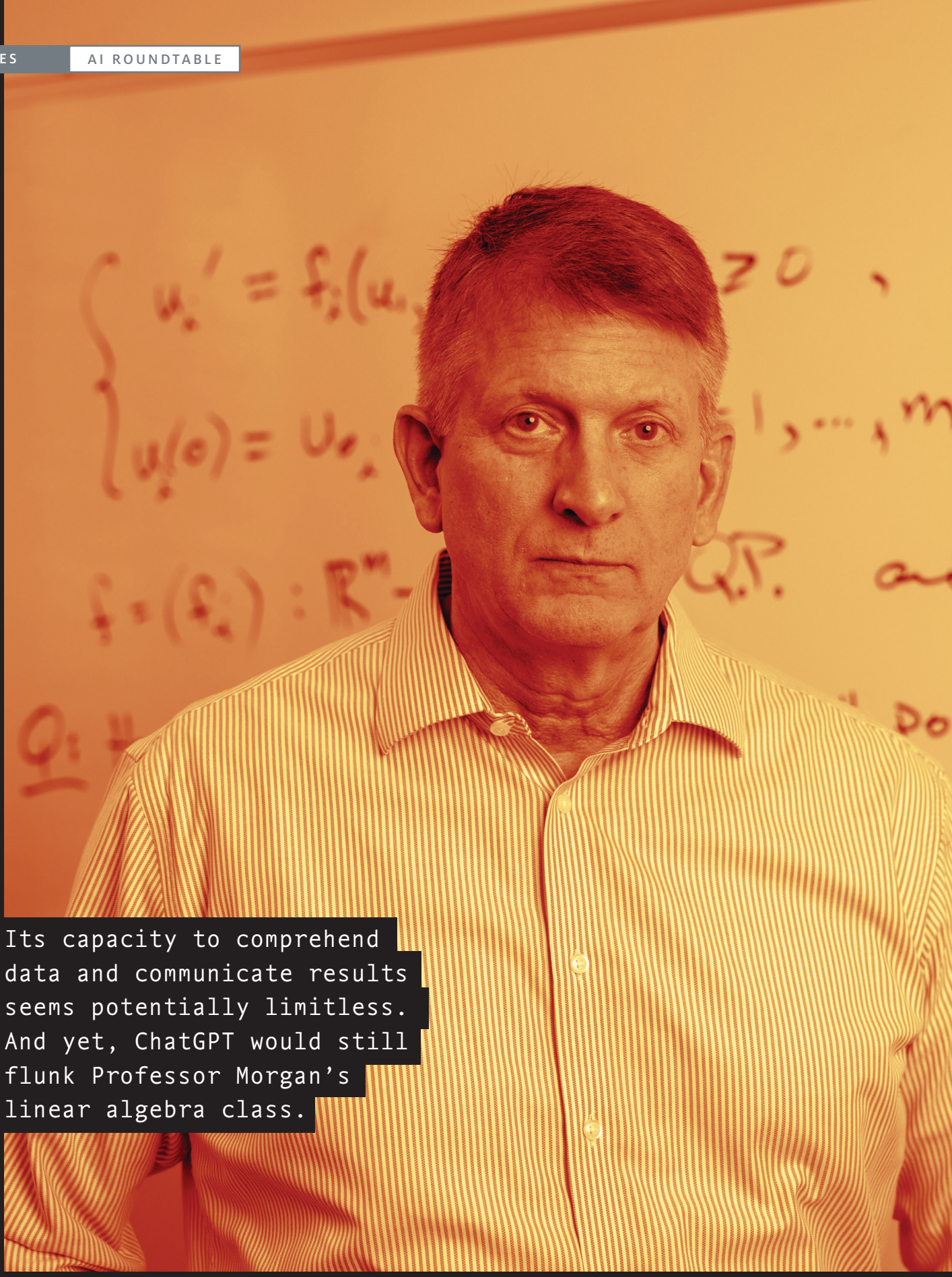
IS AI FRIEND OR FOE?



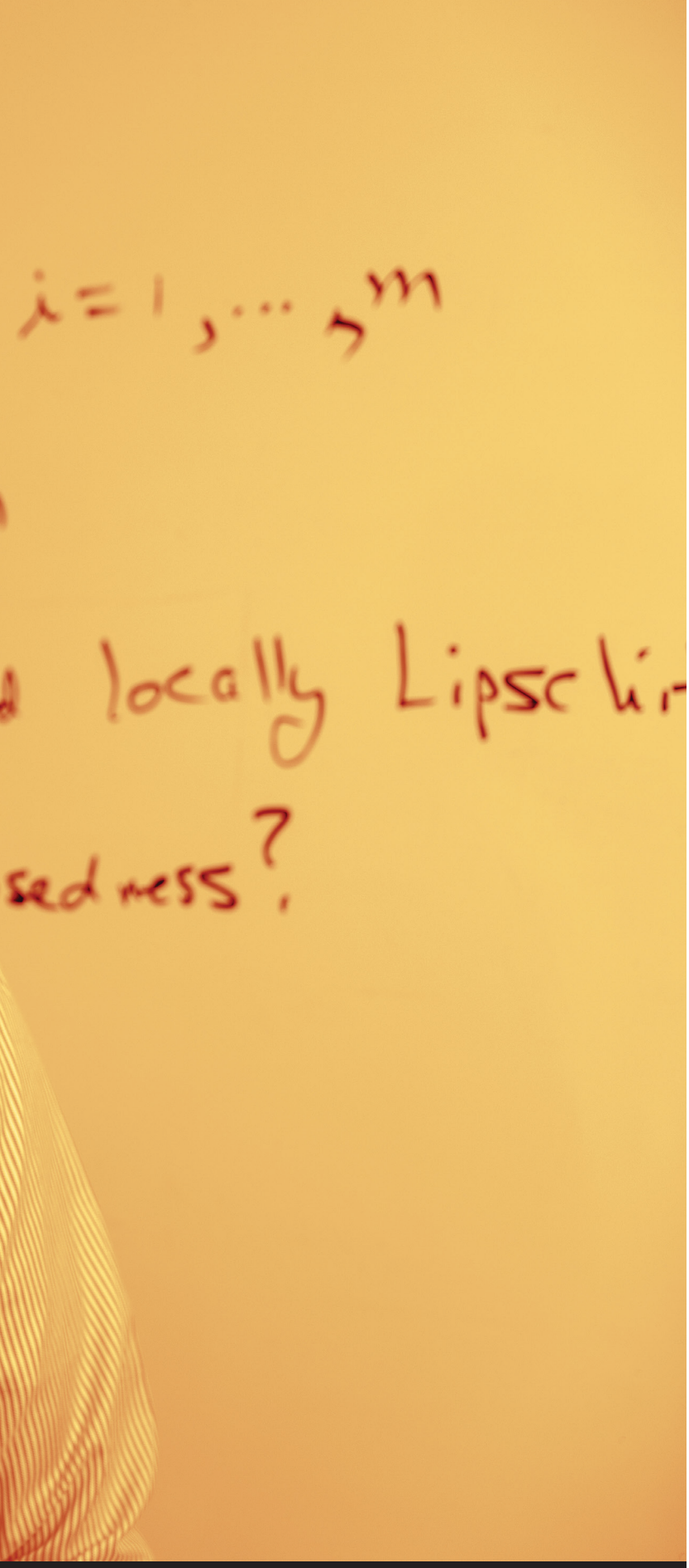
A Roundtable Discussion About the Future of AI

By Sam Eifling





Its capacity to comprehend data and communicate results seems potentially limitless. And yet, ChatGPT would still flunk Professor Morgan's linear algebra class.



IN APRIL OF 2023, JEFF MORGAN, A mathematics professor and associate provost at the University of Houston, decided to give ChatGPT a math test. Specifically, he wanted to determine if the massively popular artificial intelligence platform—still less than six months old at the time—could solve the type of question he would pose to the sophomores in his linear algebra class.

He asked the machine, "Can you determine the number of positive definite 2 by 2 real symmetric matrices whose entries are integers from -10 to 10?" When he later recapped this quiz for a post on the UH AI/ChatGPT blog, he wrote that the problem was one he could solve by writing a few lines of code. In other words, it was the sort of quiz the world's most powerful, publicly available AI chatbot should be able to parse with ease.

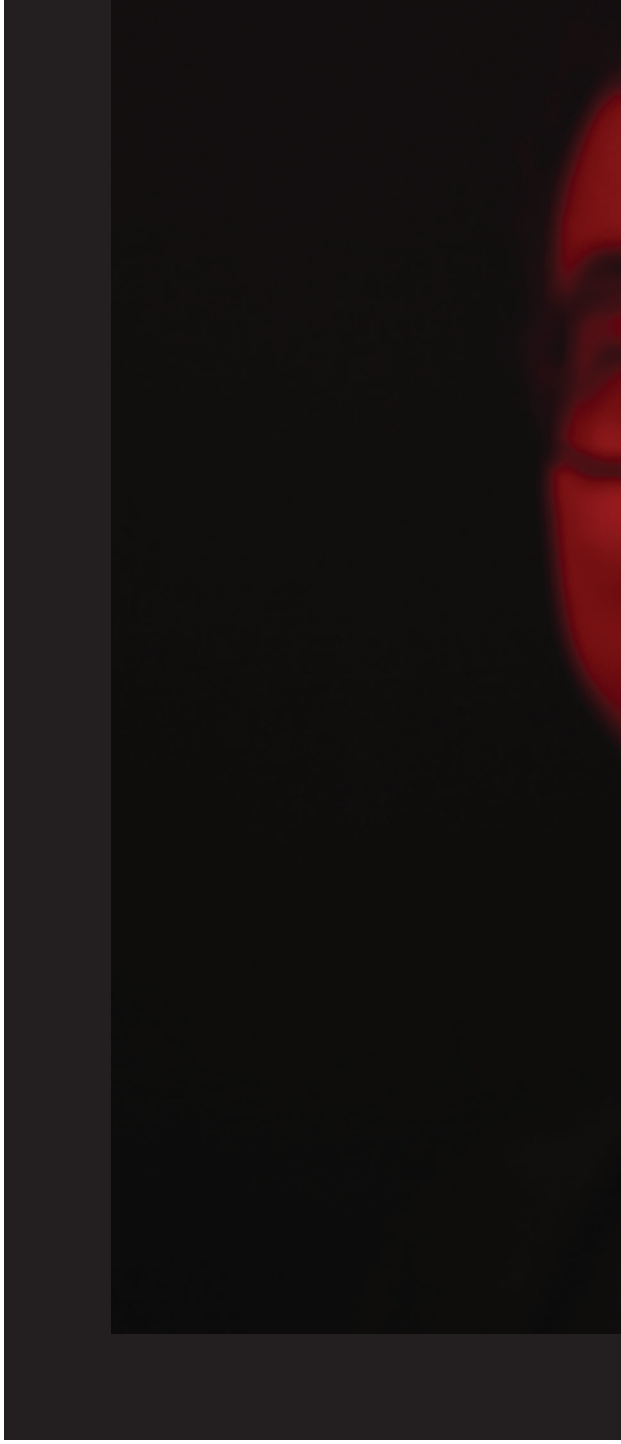
Instead, the machine made a series of simple mistakes, wrote some gibberish that Morgan called "pseudo code," and came up with an answer of 310, well off from the true answer of 986. The professor concluded that ChatGPT seemed to understand the question, but badly fumbled the logic needed to answer it. When he shares results like this with his class, Morgan's message to the students of 2023 is "buyer beware."

"I was very open and honest with them," he says. "The underlying statement to them was, 'Hey, be careful with this stuff because it can give as many wrong answers as it gives right answers.'"

The past year has felt, by any reckoning, like an inflection point in the progression of artificial intelligence, the branch of computing that broadly gives machines the ability (or, at least, the perceived ability) to learn, to reason and to converse at or beyond the abilities of human beings. Even more exciting: The machines seem to be able to analyze new data without being told what kind of data it is, or that it's even data. Their capacity to comprehend data and communicate results seems potentially limitless.

And yet, ChatGPT would still flunk Professor Morgan's linear algebra class due to AI's clear limitations. We asked Morgan and two other UH faculty members who study AI in different capacities to assess the technology and to guess where it's going. As undergrads, executives, creatives, researchers, policymakers and tinkerers all seek to sort out the future of AI, the view from UH's cognoscenti is that the machines have promise—if we can get to know their strengths and weaknesses.

AI DEMANDS A NEW KIND OF COMPUTER LITERACY



MENG LI, PH.D.
Professor in the C. T. Bauer College of Business
Director of Bauer Human-Centered AI Lab

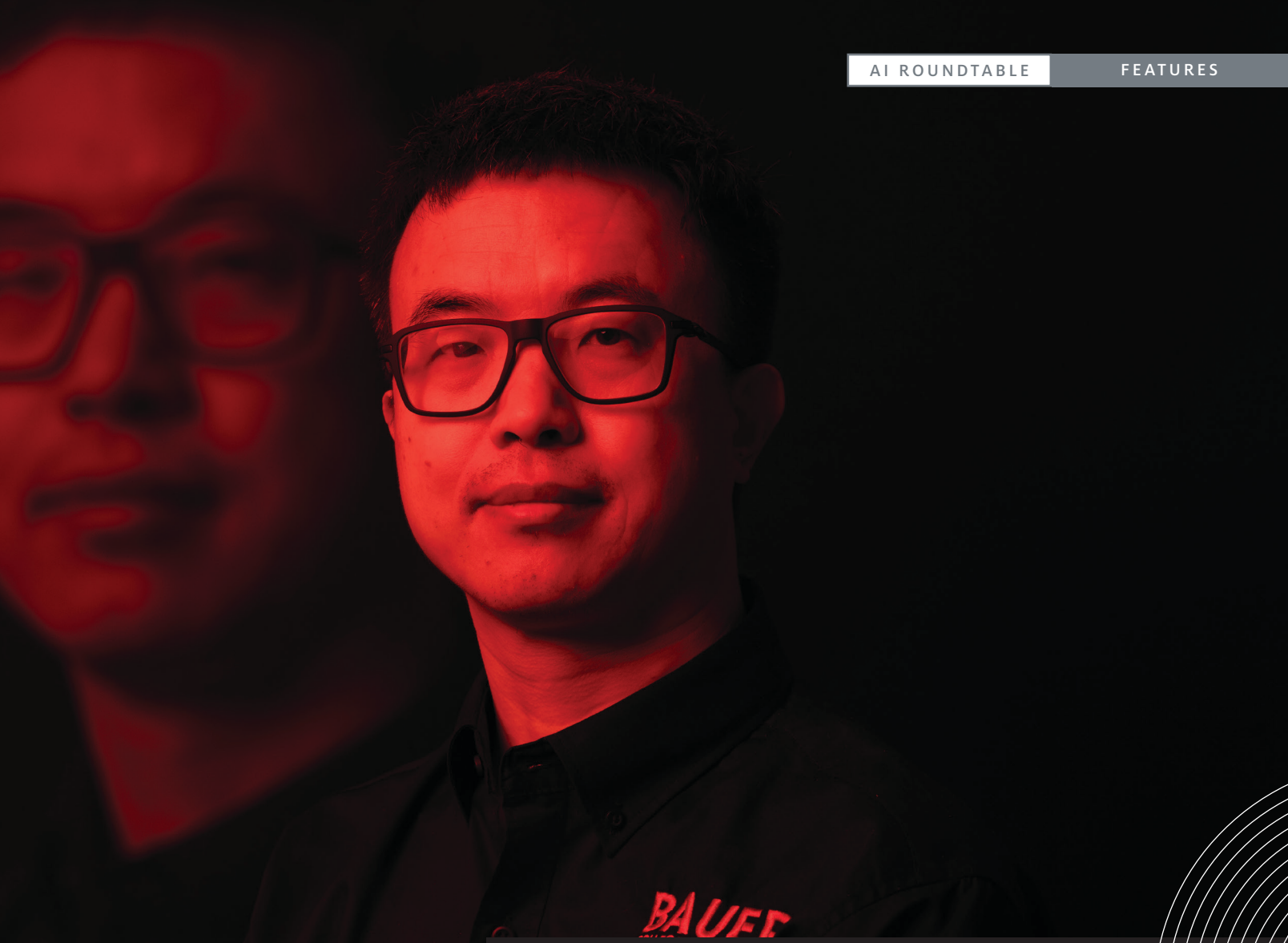
PROFESSOR MENG LI COUNTS HIMSELF FIRMLY in the camp of AI believers. One day, he expects most of us will be using some sort of AI tool to help us with our jobs, with relatively little downside. Until then, his research shows, people and AI are in an uneasy period of getting to know one another, and the degree of trust that we put into AI must be situational. Not all AI applications are created equal, and as we encounter these new tools, we need to be aware of limitations—theirs and ours.

In the rush to deploy AI, researchers haven't had enough time to put guardrails on the technology. Platforms such as ChatGPT operate on enormous amounts of data—inputs that the machines examine and synthesize into conclusions. In Li's view, AI product developers run a risk of gathering so much data and processing it so quickly that they don't leave enough time to "clean" the data (that is, to examine the data for underlying flaws or biases) or to properly safeguard people's privacy.

"Most people didn't expect ChatGPT to be so influential," Li says. When it debuted in 2022, ChatGPT became the fastest commercial app in history to reach 100 million users. The speed at which the world has adopted some form of AI has far outpaced the speed of research on its strengths and drawbacks. "We are slower as researchers, but I think we are catching up now. We are trying to understand whether AI can cause particular problems and how we address bias, collusion, all of these things."

Responsible AI usage also means relying on it to execute certain tasks on which it outperforms humans. Yet many users—physicians, for instance—don't believe the machines can outdo them … yet. "We find there is resistance in adopting AI from very smart people," Li says. Doctors may not want to cooperate with machines that may one day take their jobs, or they simply may not agree with the conclusions these guidance systems offer. In either event, that mistrust could impede patients from getting the best treatment.

In his research, Li notices similar results in other settings as well—indications that people regard AI as an interloper of sorts. When buyers and suppliers haggle, for instance, he sees suppliers quote higher prices to the buyers when the buyers reveal they're using an AI chat-

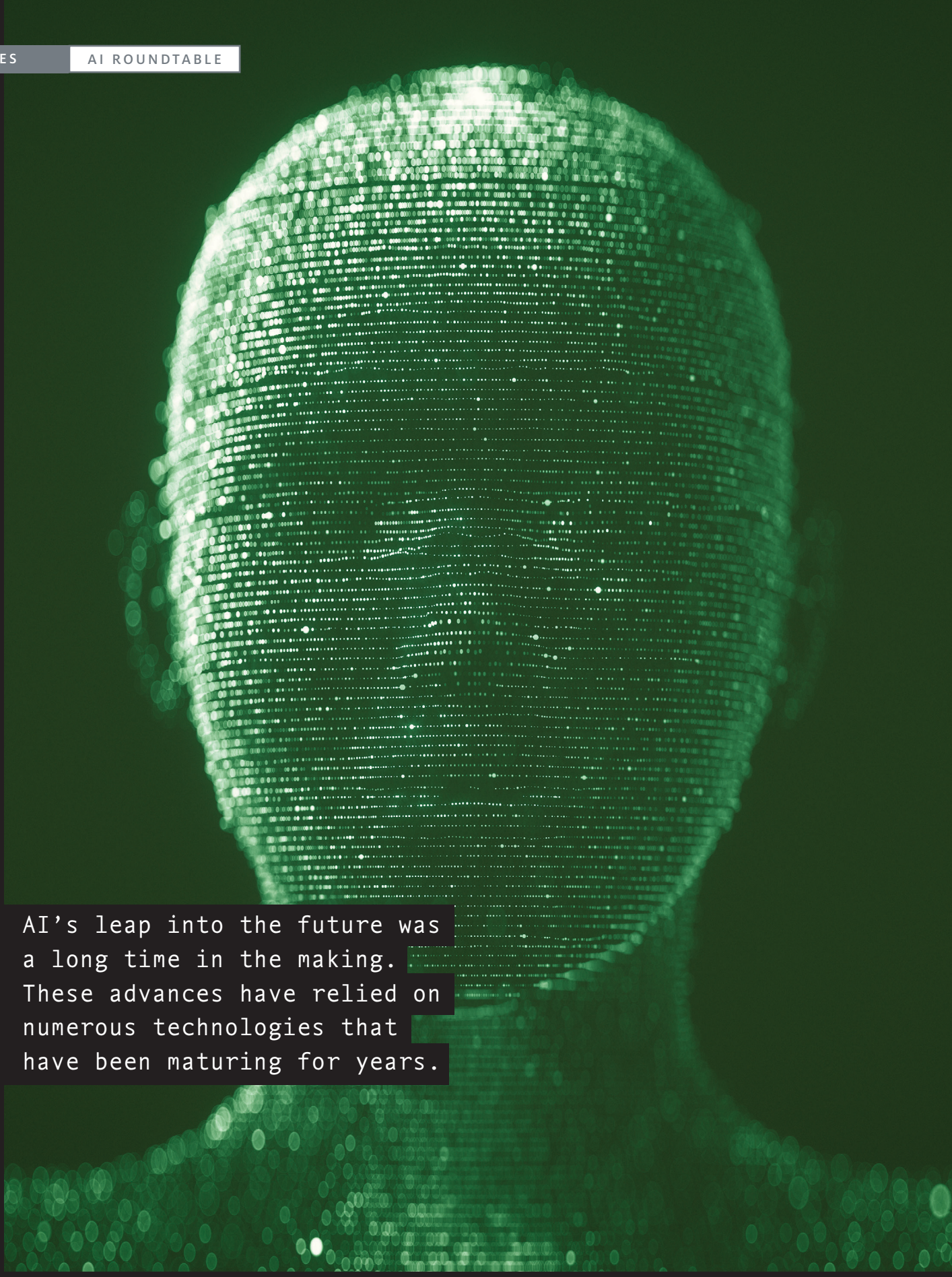


Li's research also finds that people tend to forgive mistakes that other people make. But they have slim patience for a mistake by an AI tool.

bot to lead the negotiation. People making buying decisions for large retailers resist AI's suggestions on what orders to place.

However, users do trust AI implicitly for routine tasks such as making schedules. On tasks that incorporate what one might call judgment, people are reluctant to accept an AI's suggestion, even when data show the AI system excels. Li's research also finds that people tend to forgive mistakes that other people make. But they have slim patience for a mistake by an AI tool.

"Probably that's human nature," Li says. It may take years for managers to fully trust that an AI knows as much as it does. Until then, he says, it's important to realize that one of our limitations as people is our caution, our mistrust. While AI has its flaws, it can almost certainly help us make stronger decisions at work.



AI's leap into the future was a long time in the making. These advances have relied on numerous technologies that have been maturing for years.

AI WILL MAKE US SMARTER TRAVELERS, SO LONG AS IT HAS A HUMAN TOUCH

CRISTIAN MOROSAN, PH.D.
Professor in the Conrad N. Hilton College of Global Hospitality Leadership

TRAVELING IS FRAUGHT WITH CONTRADICTIONS. Travelers want novelty, but they also want some familiar comforts. Travelers want the thrill of taking a chance, but they also prefer to keep risks to a minimum. Travelers want to feel like someone new—but of course, they are still their same old selves.

Since Professor Cristian Morosan studies how AI intersects with travel and hospitality, it should come as little surprise that he continues finding oxymorons. It turns out AI is great at synthesizing oodles of data about individual travelers and about restaurants, attractions, lodging and activities. AI can recommend how to build a schedule and can even go so far as to book dinner reservations or event tickets.

But for whatever reason, Morosan's research shows, travelers simply don't want to take recommendations from a machine, no matter how spot-on it might be. (Perhaps the feeling of the advice being too spot-on can unsettle a person.) Instead, it turns out, people prefer that hoteliers offer personal recommendations (even if those recommendations are AI-generated).

"Hoteliers are trying to get a set of systematic data that is clean and actionable in one single place. Right now, they don't have that," Morosan says. "So, they're trying to piece that together from multiple systems: from the property management system, from the reservation systems, from their interactions with the consumers, from what consumers disclose about themselves in the loyalty program."

Data this fractured needs a machine to sort it. But a traveler wants a person to deliver the results. The hotels offering the best customer experience, then, will be those giving a personal touch to a busy traveler. When a person arrives at a hotel jet-lagged, hungry and disoriented, how can their host offer the smartest, most-informed suggestions with a personal touch?

"Back in the day, I remember we did research on how people search for information on booking rooms and stuff," Morosan says. "And what we found is that consumers find the right product immediately, but they're going to keep searching anyway."

The key to quieting the traveler's anxiety about making suboptimal choices will probably be a blend of AI-based data-crunching and a host who looks them in the eye and gives what feels like an off-the-cuff (but brilliant) suggestion for a great sushi place, within a short walk of the hotel, which just happens to be near a great jazz club that serves fantastic bourbon cocktails. If, in fact, that's your thing.

AI will eventually permeate the hospitality industry in ways the end user won't detect, Morosan says. It will inform beverage management programs, small-scale events and personalized experiences. It could underpin dynamic room pricing that makes booking hotel stays feel like monitoring flight prices, giving the hotel industry tools to maximize occupancy or to raise prices automatically when a huge event is announced. (Taylor Swift just posted at midnight on Instagram that she's coming to town in six months? The pricing system will bump up room rates in a jiffy.)

If Morosan's predictions prove correct, AI will make increasingly more suggestions that take the homework out of travel. That is, if people wish to listen to its answers.

"Hotels shouldn't necessarily have the goal of adopting AI as part of the services," he says. "The broader goal should be to reimagine how they fit in today's world and what is their service. By addressing that, they will automatically figure out the role of AI in this equation."

AI WILL MOVE EVERYONE TO THE FAR RIGHT OF THE BELL CURVE. THEN WHAT?

JEFF MORGAN, PH.D.
Professor in the College of Natural Science and Mathematics

SLIDE INTO A DISCUSSION ABOUT CHATGPT WITH Professor Jeff Morgan and you're likely first to be transported back to 1950. That's when Alan Turing, the grandfather of modern computing, published a paper called "Computing Machinery and Intelligence," wherein he introduced the so-called Turing Test—a measure of whether a machine can convince a human that it was, in fact, another person.

In the 1970s and 1980s, researchers pioneered reasoning systems that amounted to forerunners of today's machine learning. In the 1990s and early 2000s, the industry introduced neural networks, which gave the appearance of creativity and original "thoughts" that couldn't be reconstructed simply by examining the inputs.

AI's leap into the future was a long time in the making. These advances have relied on numerous technologies that have been maturing for years. And, as it happens, ChatGPT is still prone to many errors. (The gaffes AI made in Morgan's linear algebra question demonstrate this point.)

Still, the recent explosion in AI tools represents important progress, in Morgan's view. Just as graphing calculators and spreadsheets have given amateur statisticians and scientists computational powers once reserved for brilliant mathematicians, AI will raise the roof of what's possible for almost everyone who uses it.

"In a lot of areas, what AI is going to do is, it's going to take everybody from the least-capable up to maybe the 95th percentile," Morgan says, "and it's going to throw 'em all up to the 95th percentile. It is going to change this whole notion of a bell curve, I think, in a lot of areas."

At UH, a group of several dozen faculty and staff discuss AI on a dedicated listserv, of which Morgan is a member. During the life of that discussion, Morgan says, the prevailing attitude has moved from one of awe and concern to one of patient curiosity. What will AI mean for current students? For future students? For the university itself?

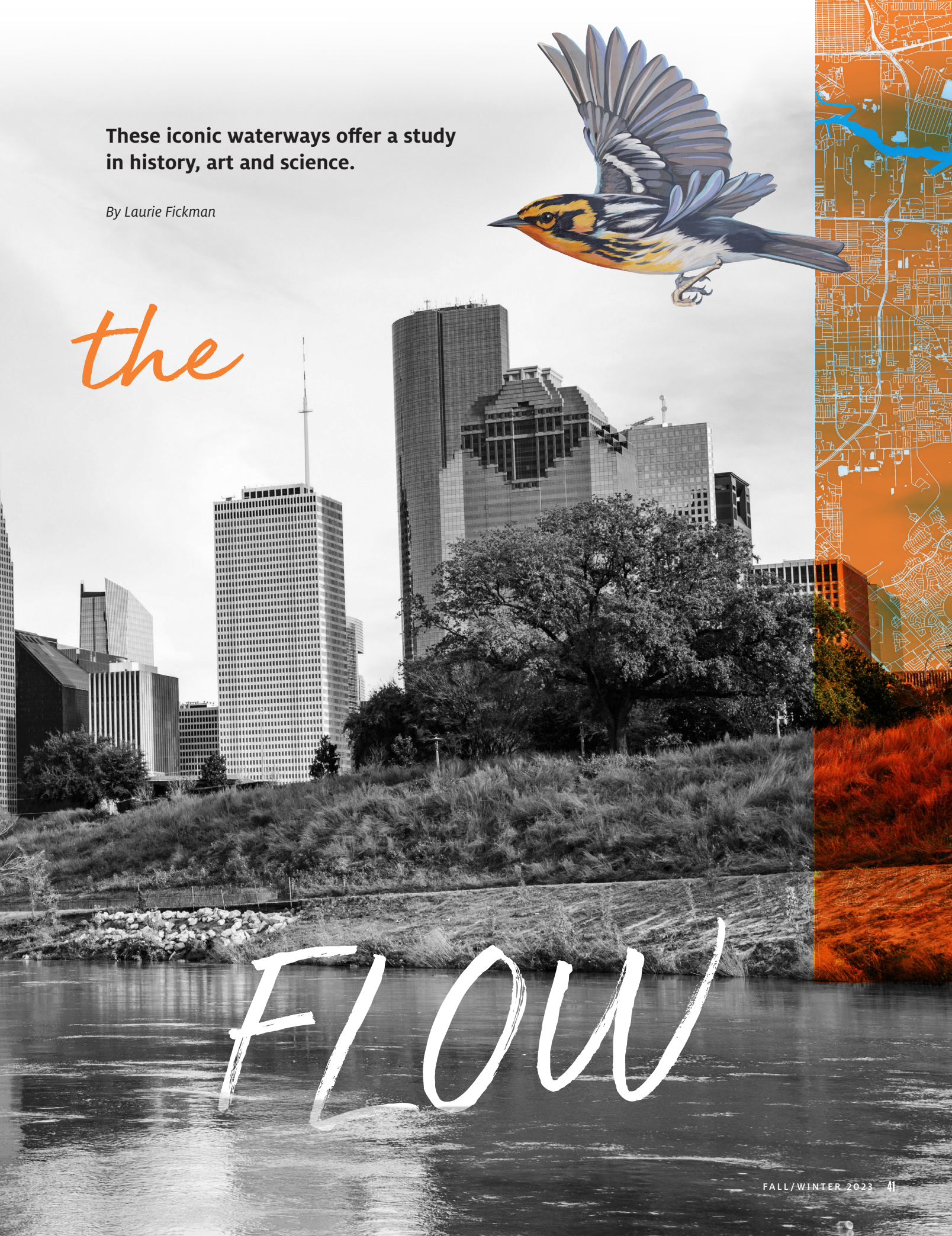
Over time, Morgan has come around to take the long view. Some things about learning, and about life, endure for good reason: Books, classrooms and human teachers are here for the long haul. Generally speaking, people gravitate towards other people. As for discernment? Morgan says, "Machines in general just have a hard time determining whether some things make sense."

When it debuted in 2022, ChatGPT became the fastest commercial app in history to reach 100 million users.

GROW
with

These iconic waterways offer a study in history, art and science.

By Laurie Fickman



the FLOW

Perhaps the unsung heroes of Houston,

its bayous have been shaping the city for hundreds, even thousands of years. Critically important to Houston's economic success, the bayous have become vibrant canvases for public art, outdoor classrooms for conducting ground-breaking research and natural spaces for outdoor activities. Houston's bayous are not just swampy water—they're the lifeblood, the canvas, the green oasis and the laboratory of this incredible city.

OH, GIVE ME A HOME ...

The oldest of the Houston's four major bayous, Buffalo Bayou was formed 18,000 years ago and was home to the indigenous Akokisas and Karankawa peoples. Lifetimes later, Houston's bayous would become vital pieces of the city's drainage and water systems and catapult the town to become an influential trade center. The contributions of the county's 23 watersheds feeding into the area's major bayou waterways were so important that Houston would take on the moniker, "Bayou City."

Little doubt exists that buffalo once roamed over the aptly named Buffalo Bayou. In fact, fossils found close to Armand Bayou point to bison in the area 35,000 years ago.

But the history of Houston's bayous doesn't begin and end with a species stampede. Diaries from Spanish explorer Cabeza de Vaca in 1535 note the lifestyle of Native Americans along the bayou banks, where they crafted dugout canoes, fished and formed villages.

That was eons before the bayou's wartime historical significance became etched in state history. The point where it merges with the San Jacinto River was the famous site of the final battle for Texas Independence, the Battle of San Jacinto in 1836. Yes, Buffalo Bayou is the site where

PHOTO BY GEOFF LYON/COURTESY OF BUFFALO BAYOU PARTNERSHIP

Sam Houston and his army of 900 Texans defeated General Antonio López de Santa Anna and his Mexican army of 1,300 men.

In case you wondered, in Texas that's what's called an historical mic drop.

BUILDING A CITY ON SWAMPY BAYOU LAND

Later that year, two brothers, John and Augustus Allen, founded the city itself at the confluence of Buffalo and White Oak Bayous, a spot to be forever known as Allen's Landing, the birthplace of Houston. Maybe they were visionaries, or maybe just braggarts, but they envisioned—and touted—a world-class city and enticed people to join them, distributing flyers portraying Houston, with its accessible bayous, as a mercantile center of transport and commerce.

It wasn't. At least not yet.

"The bayou was nowhere near navigable to big ships at that point," says Debbie Harwell, instructional assistant professor of history at the University of Houston College of Liberal Arts and Social Sciences and the Honors College. "But what's interesting is that everything they put in the ad, which was false at the time, comes to pass. Not because the Allen brothers did it, but because they had the vision of what Houston could be and the civic leaders who followed really made it happen."

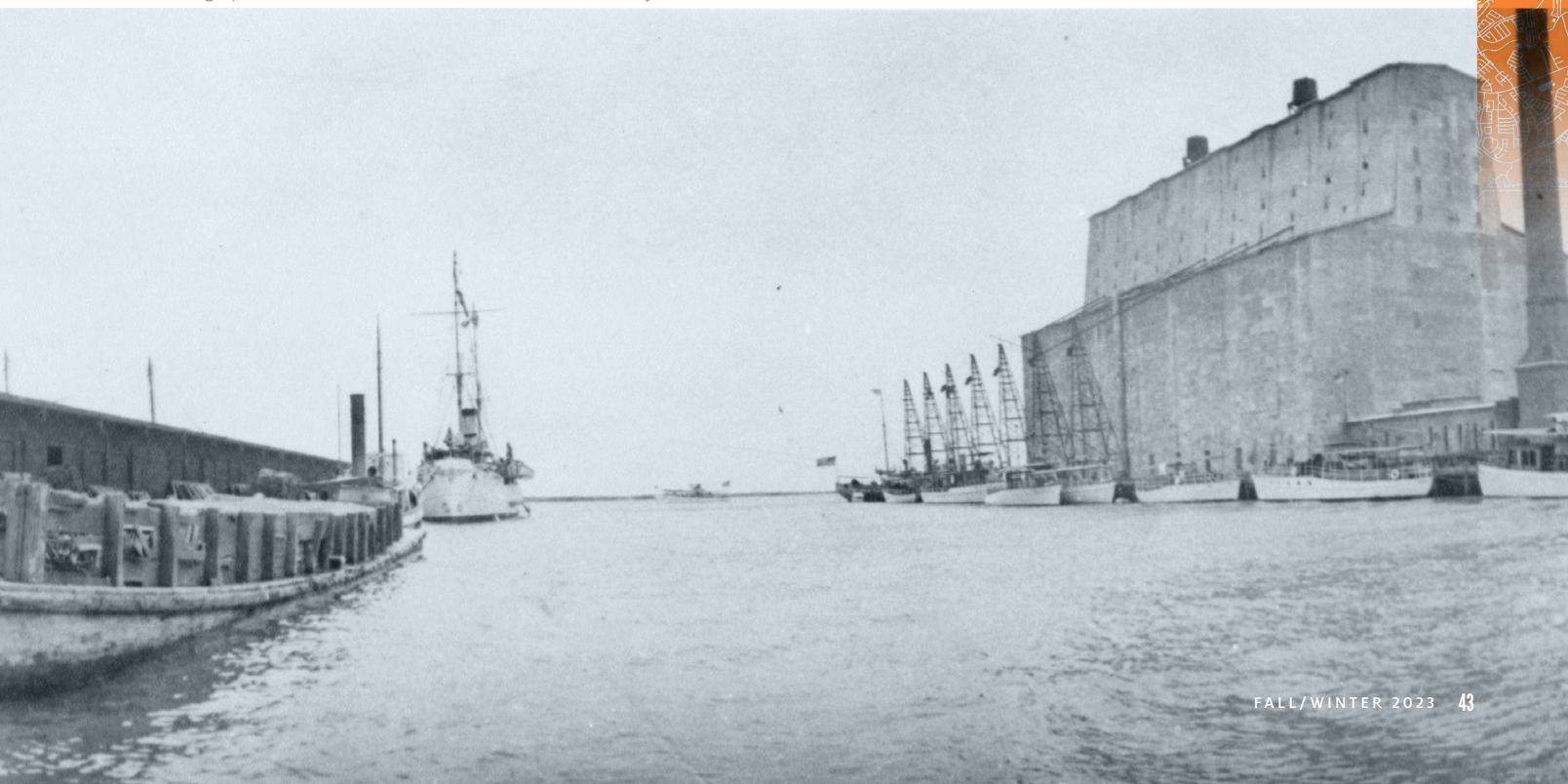
As advertised, Buffalo Bayou played a key role in the city's success, eventually becoming the economic backbone of the region's economy, in the form of the Houston Ship Channel and Port Houston. The original port was downtown at Main Street where the bridge crosses at Allen's Landing and later, the University of Houston-Downtown.

"You don't want your port in the middle of a growing downtown, so they had to dredge the bayou to make it deeper and wider, and in 1914 it was opened as a deep-water port a few miles east of downtown," Harwell says.

Today, Port Houston is one of the busiest seaports in the world. And as historians often sum up: "Houston is the town that built a port that built a city."

Of course, historians in the know add that it all started with the bayous.

Vintage photo of a view across the waters of Buffalo Bayou at the Port of Houston.



Tolerance, by internationally recognized Spanish artist Jaume Plensa, is a group of seven sculptures placed in 2011 alongside the construction of the Rosemont Bridge.

The TTWEAK permanent art fixture located at Allen's Landing is etched into the wharf to commemorate goods traded in the past.

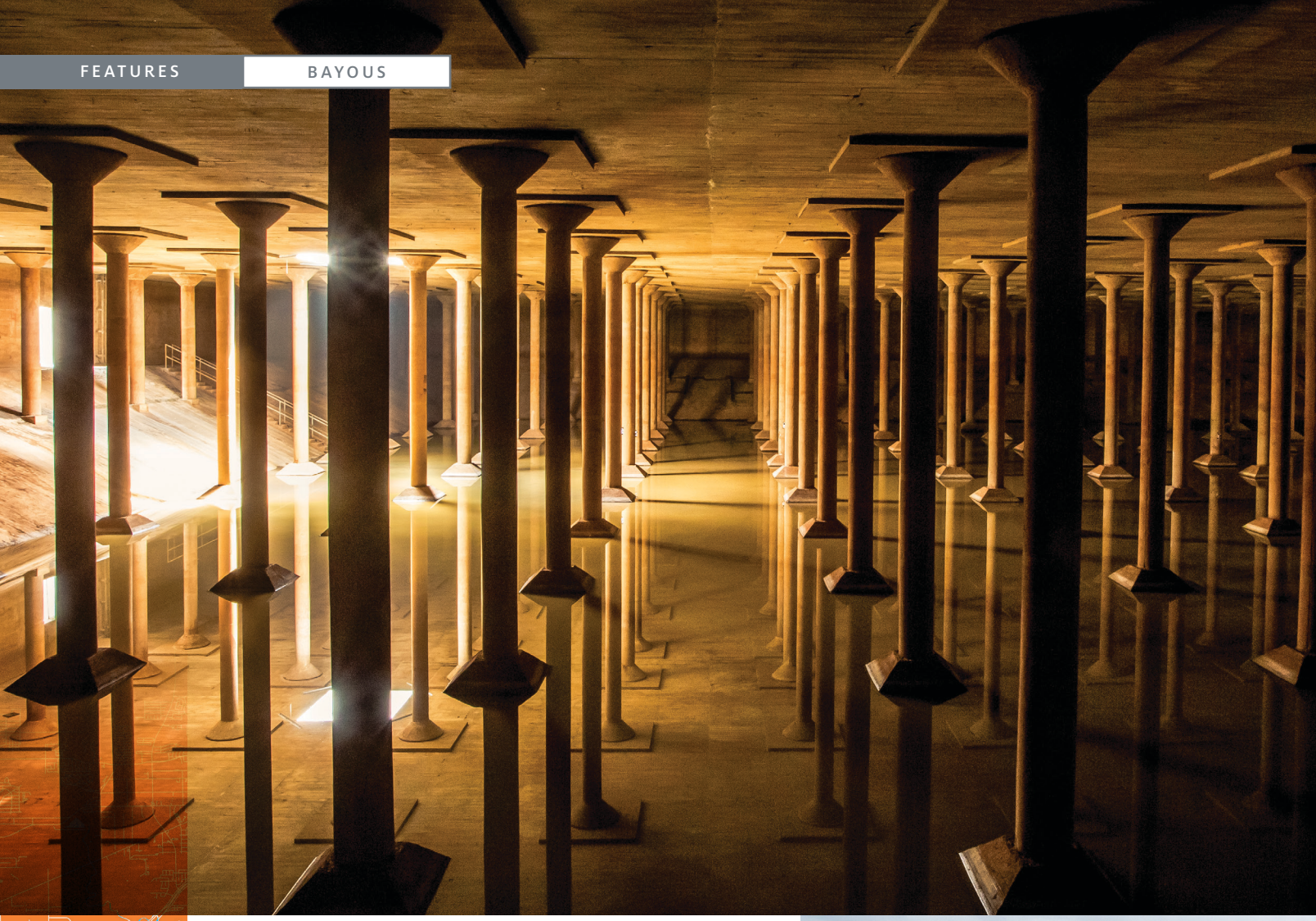
BEAUTY ON THE BAYOUS

Imagine the glee in the eyes of the prophetic Allen brothers if they knew the 10-mile stretch of Buffalo Bayou from Shepherd Drive to the Port of Houston Turning Basin became a veritable outdoor art exhibit, housing world-class permanent and temporary works of art. Among the permanent fixtures is a piece by the design and art firm TTWEAK etched into the wharf at Allen's Landing commemorating the site and the goods that were traded there—from molasses to hemp rope.

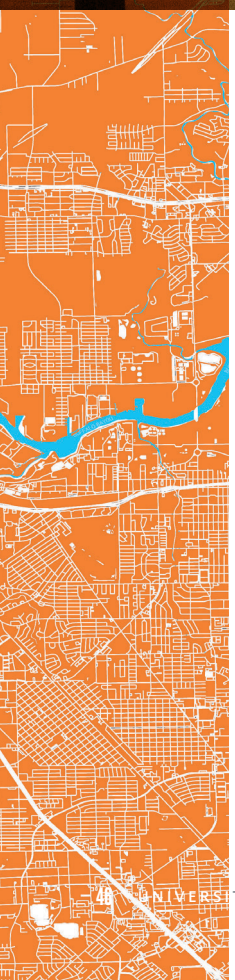
> “This mural is about celebrating Bayou Greenways and discovering Houston’s amazing position in the center of North America’s largest migratory flyway.”

Fittingly titled, "Confluence," a 223-foot-long mural on the retaining wall at the confluence of White Oak and Buffalo Bayous, is a tribute to the bayous themselves, with images of six bird species floating above Houston’s bayou system.

As benefactor Laura Bacon describes it, “This mural is about celebrating Bayou Greenways and discovering Houston’s amazing position in the center of North America’s largest migratory flyway. One day, Houston will be known as the only major city in America where you can eat at an award-winning restaurant on Saturday night, stay in a wonderful hotel, and see 128 species of birds before noon on the following morning.”



The Buffalo Bayou Park Cistern is open to the public for historical tours as well as art tours.



More Houston art magic was unearthed at The Buffalo Bayou Park Cistern. An underground, former water reservoir in Buffalo Bayou Park, this once-hidden gem is open for history and art tours.

BAYOUS AS ENVIRONMENTAL RESEARCH CENTERS

At various times, the bayous also serve as the perfect petri dish for earth and atmospheric scientists, environmental researchers and many other research departments at UH.

Case in point: Hurricane Harvey, the largest rainfall event in U.S. history that caused massive flooding in Houston in 2017, also served to underscore why Houston's bayous and waterways are still educationally relevant and a valuable tool to help predict Houston's geological future. A post-Harvey research team, in the lab of Julia Wellner, associate professor of geology, used lidar, or light detection and ranging, a remote sensing tech-

PHOTO BY KATYA HORNER/COURTESY OF BUFFALO BAYOU PARTNERSHIP

nology that measures the elevation of the ground surface, to determine the elevation change from pre-storm to post-storm due to sediment movement. The team uncovered numbers and comparisons that seem staggering. Twenty-seven million cubic meters of sediment, or 16 Astrodomes, moved through 12 Houston waterways and Addicks and Barker reservoirs during the nightmare that was Harvey, decreasing holding capacities in the reservoirs by about 1.2% and 1.6%, respectively.

After the storm, up to five feet of sediment accumulated in the Houston Ship Channel. It cost $350 million to dredge the channel back to its pre-Harvey depth. From August 25 to 31 of 2017, the study found the amount of sediment moved through Houston was equivalent to about 40% of the sediment discharged annually to the Gulf of Mexico by the Mississippi River. Worse yet, researchers concluded, the enormous amount of sediment, or sand and mud, that flowed through Houston waterways during Hurricane Harvey could seriously impact future flooding events and be costly to the city of Houston.

The team doesn't place full blame on the hurricane. Researchers correlate modifications made by humans to bayous, rivers and streams over the past century, with empowering Harvey to do its worst.

Also, shortly after Hurricane Harvey ravaged Houston, members of Hanadi Rafai's environmental engineering lab collected water samples from 41 bayou sites for 90 days. They found the flooding transported as much as 1,000 kg of chromium and 650 kg of nickel into Galveston Bay and caused a drop in the pH of the region's waters.

"Bayous are an open and limitless laboratory for exploring and understanding our natural and built environments," says Rifai, Moores Professor and director of the Hurricane Resilience Research Institute. Rifai says she uses the bayous "as often as possible recreationally and quite often for research."

BLAMING THE BAYOUS

Still, with all their rich history and ability to serve as living classrooms, Houston bayous often get a bad rap. They quickly overflow in rainfall and, as Harvey history shows, send torrents of water through the streets during hurricanes.

Efforts like Project Brays, a $480 million plan of action that reduces flooding risks in the Brays Bayou watershed, are underway. Project Brays is the largest flood damage reduction program ever undertaken by the Harris County Flood Control District.

"We have developed faster than our infrastructure can keep up. But don't blame the bayous, they were here first!" says Harwell.

Perhaps it's no coincidence that in Houston, a city marked by its entrepreneurial drive, even its natural landscapes have been harnessed for growth.

The Correlation Between Stream Modification and Sediment Movement

By Rebeca Hawley

RIVER STRAIGHTENING, A TYPE OF ARTIFICIAL stream modification, is an engineering technique used to shorten the distance to the ocean and increase water flow, which reduces flooding in surrounding areas.

The technique was used on Houston's waterways in the 1940s and '50s. Straightening can be as minor as removing bank vegetation or as extreme as replacing the banks and channel floor with concrete. While it paved the way for urban development in Houston, a recent University of Houston study found more sediment now moves downstream as a result.

Andrew Stearns, first and corresponding author of the 2023 sediment routing study published in "Geology," found a notable correlation between stream modification and sediment bypass. The study was conducted while Stearns was earning his master's degree in the laboratory of Julia Wellner, associate professor at UH's College of Natural Sciences and Mathematics.

"Our study provides policymakers with vital information for sediment management in urban watersheds. Not much attention has been given to sediment management, but it has big implications for the city itself, and can be quite costly when omitted from a watershed plan," Sterns explains.

Sediment deposits left in the wake of Hurricane Harvey reduced holding capacities in Addicks and Barker reservoirs by more than 1%.

"If Harvey were to happen again today, there would be less room for water in Addicks and Barker reservoirs because of the sediment that got left behind from Harvey,"

Wellner says. "That's the significance—sediment takes up space no longer available for water."

Stearns cites Lake Houston as an example. A large sand bar recently emerged from the water where the west fork of the San Jacinto River enters the lake near Kingwood. The U.S. Army Corps of Engineers has dredged the top of the bar several times in recent years.

"If you have this big mound of sediment blocking water flow to the lake, there's less area for the water to go," he says. "During floods, the water goes around that bar of sediment, and into somebody's house."

CAUSES OF MASSIVE SEDIMENT MOVEMENT

The research team utilized lidar technology and ground observations to study elevation changes due to sediment shifts. Stearns says there was so much sediment in the waterways due to compounding factors of the deluge of rain and human modifications to the surrounding environment.

"We found 75% of Houston received over three feet of rain in five days," he says. "When you get nearly your annual rainfall in such a short amount of time, that's going to move large amounts of sediment quickly."

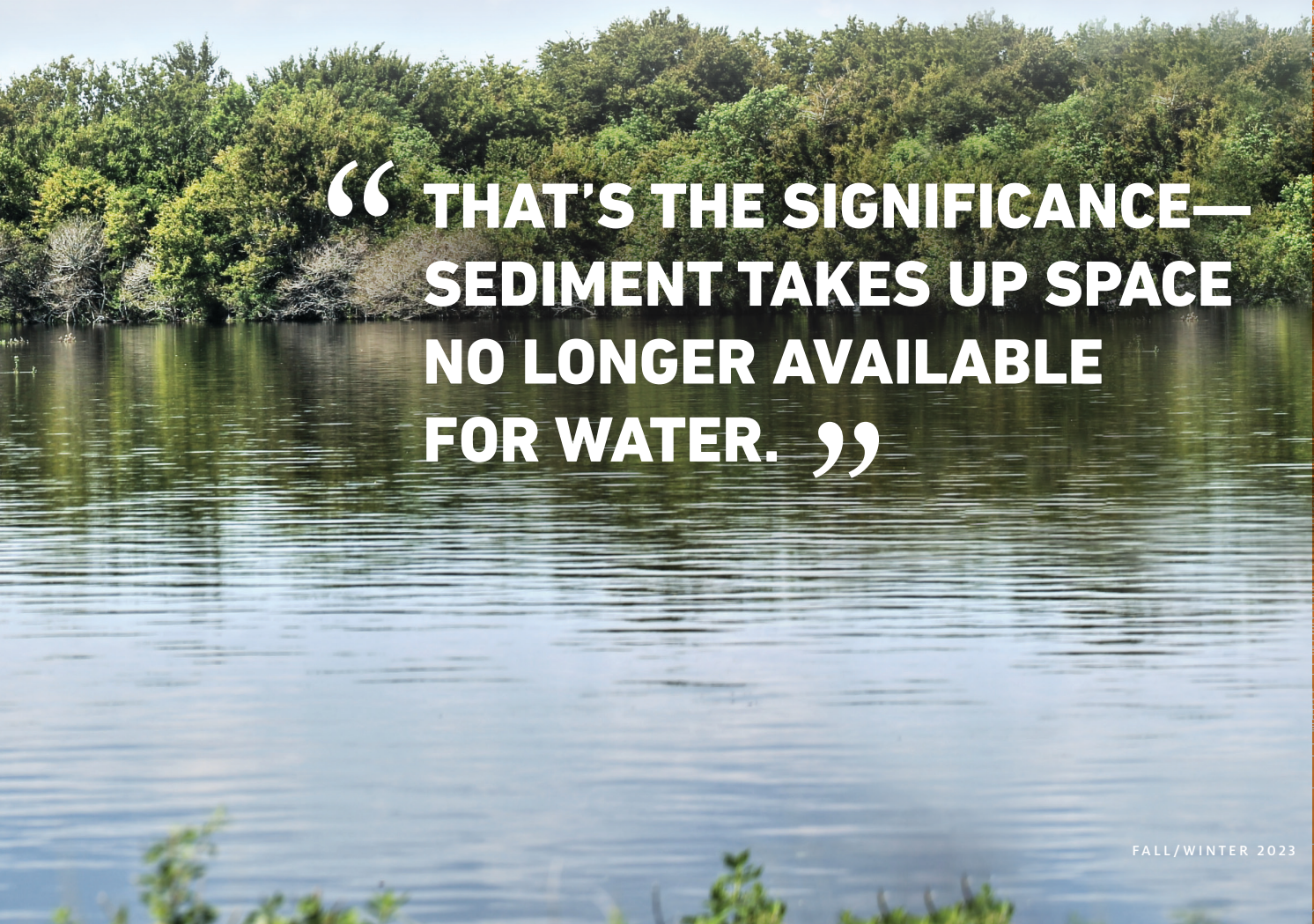
Whether humans created or contributed to more sediment, Stearns and Wellner say it is likely. Because urban sprawl has covered prairie and natural green spaces with impermeable concrete, more water flows into drains and eventually to surrounding bayous. And with more developed land, erosion rates are higher as well, which contributes to the sediment.

"With more rainfall, more runoff and more erosion, you are moving more sediment through bayous and rivers," Stearns explains.

INFORMATION FOR POLICYMAKERS ON A BUDDING RESEARCH TOPIC

The team hopes their study leads researchers and policymakers to collect data on regional sediment movement on a regular basis, not only because of how costly it is to dredge sediment out of waterways, as seen in the ship channel, but also because of the potential impact it can have on flooding in the Houston area. Additionally, they want policymakers to see the impact river straightening can have on sediment movement.

Shuhab Khan, professor of geology at UH, and Jerome Kendall of the University of New Mexico are contributing authors of the study.



In the 1960s,

Barron Hilton was so sure we would eventually have human beings living beyond Earth that he endorsed a plan for the Lunar Hilton, an underground hotel on the moon, complete with a space station and sleek room keys. In perhaps a nod to the timeline Hilton was considering, a mock-up reservation card advertised by the company included the "date of travel" to occur in the 1980s.

"He presented a talk on the future of space tourism and basically said Hilton [Hotel] wants to be there," says Mark Young, a University of Houston archivist and historian who focuses on hospitality. "And it caught wind. The media picked up on it. And we've got, in the archives, files of letters people wrote wanting reservations. They came in from around the world."

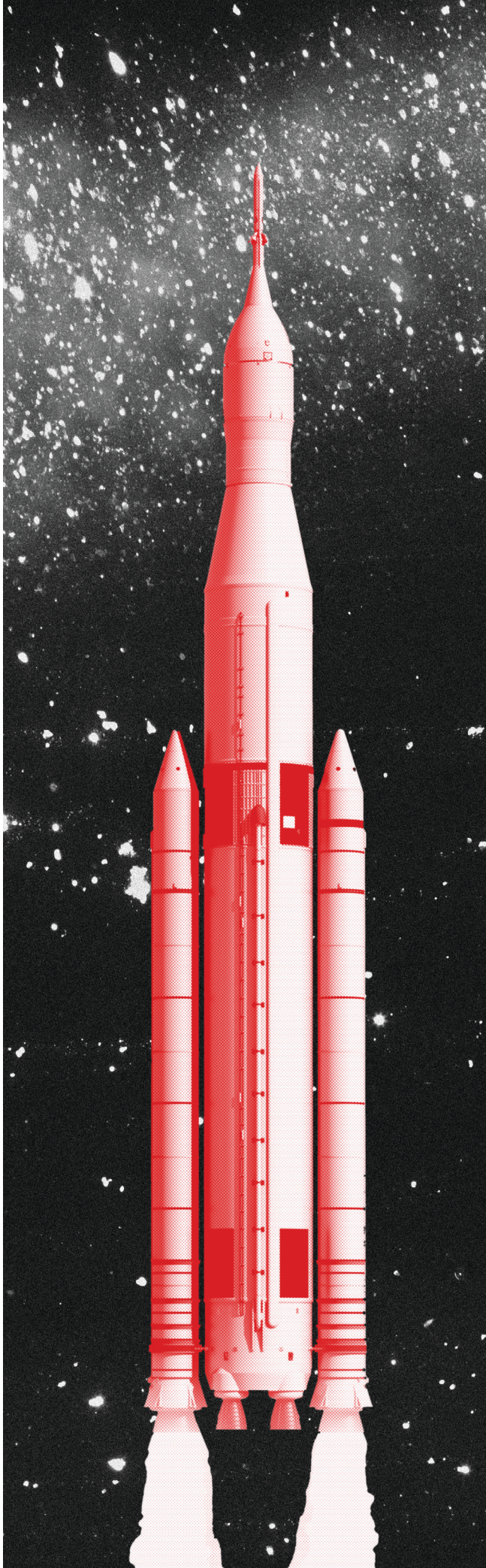
Hilton did not get to see his idea come to fruition. But lately, something interesting is happening in the world of space travel. People are once again invigorated by the idea of exploring, if not living, outside the confines of the Earth's atmosphere. Billionaires have thrown their fortunes behind the cause.

As Hilton's intentions show, commercial interests were also looking to get a slice of the pie, even back then. But that's where comparisons end between the original space race and the one taking root today. Hilton was relying on government-funded space exploration to do the legwork. These days, the billionaires in the mix are a guiding hand in shaping the future of cosmic expeditions.

A BRAND NEW SPACE RACE

The space race of the '60s was a time of intense competition. Developments were fueled by patriotism and rivalry, with the U.S. and the Soviet Union trading barbs as they pushed technological limits.

"The Soviets were the first to send up a satellite—and from my understanding, it wasn't very significant that they sent one up in '57, and we sent ours up in '58," Young says. "But to the American public, it was just, you know, oh my God. It scared a lot of people."



The New Space Race

As billionaires pursue other-worldly experiences, UH's space experts dive into how we are navigating a new kind of interstellar chase.

By Shawn Shinneman

“The inclusion of private industry distinguishes the new space race.

As a percentage of total federal spending, NASA’s funding peaked in 1965 and 1966, when it represented more than 4% of the U.S. budget. Today, that figure hovers around half of a percent.

Yet, nearly six decades later, we’re entering a new era of exploration. This new space race features many more players—not only the U.S. Involvement from countries like China, Japan and India has led to a steady drumbeat of advancement. In August, when its Chandrayaan-3 touched down, India became the fourth nation to land a spacecraft on the moon—and the first to plant it on the rugged terrain of its south pole.

But the entrance of these nations is just part of the story. The inclusion of private industry distinguishes the new space race. Some of the wealthiest people in the world have thrown their weight behind research and development. Elon Musk’s SpaceX has even found a way to turn a small profit, returning $55 million in income from $1.5 billion in expenses during the first quarter of 2023, according to the Wall Street Journal. It makes money selling rocket launches to NASA, helping governments or other companies deploy satellites and offering space tourism experiences for as much as $1 million per voyage.

Billionaires Jeff Bezos, Richard Branson and Mark Zuckerberg are also in the mix. The first two have been to space themselves on crafts built by their own companies. The latter wants to plant a camera and a computer chip on a postage stamp-sized, robotic “ship” and transport it by laser up to 100 million miles per hour to the star system Alpha Centauri. It’s a trip that would typically take 30,000 light years but, at a quarter of the speed of light, would take the Zuckerberg-backed Starshot Project just 20.

And it’s not just the big names getting in on the fun. Led by Houston-based Axiom Space, several companies have been exploring commercial activities in low earth orbit.

“There are several goals right now that agencies and companies are pursuing, and it’s all very exciting,” says Olga Bannova, who

serves as director of UH's space architecture graduate program. "That's what makes it different. There are several options to explore right now, and more and more startups are finding success."

Bannova hopes the myriad players will come together in conversation and share what works and what doesn't. When she takes students through the first space race's ups and downs, they all conclude: We would've gotten a lot further if it was a collaboration, not a race. Competition might've driven investment, but it also caused redundancy.

She's optimistic it will be different this time around. The commercial interests in the mix may compete with each other, but there's much to be gained from collaborating and sharing successes and failures. "It's about testing and speeding up the process," Bannova says. "And getting a return on your investment faster."

Yet, despite some lofty goals, colonization remains a pipe dream—for now. Decades later, whether or not it will actually happen is still very much up in the air. When it comes to space, the more we know, the less we understand. To have people not only living on the moon or Mars but remaining there, birthing new generations and accessing all the things human beings need to survive would require connecting a lot of dots.

"There are so many things that need to be solved," says Bannova, "before we can say, 'Yeah, we can colonize.'"

BUILDING THE BACKBONE OF SPACE TRAVEL

As the only one of its kind in existence, it's no wonder Cullen College's space architecture program pulls in students from around the world—and, upon graduation, places them with some of the largest companies exploring space today. UH initially created the program because of a demand from the industry—specifically, from NASA, which needed somewhere their engineers could study and earn a degree.

“When it comes to space, the more we know, the less we understand.”

Since its founding 36 years ago, the program has been developing new ways to prepare students for careers in the industry. Directors and professors are currently working on perfecting an augmented reality training room that provides students—through the power of green screens, props, harnesses and mixed reality goggles—an immersive and realistic training experience, complete with an upper-body suit that restricts movement similar to a spacesuit.

“Our main focus is problem-solving based on a multidisciplinary approach,” Bannova says. “Learning from each other.”

She says the program has been flooded with applications. Amid this renewed energy, she’s hearing more and more of her students voice their aspirations for a career path they would’ve rarely considered before. They’ve been telling her they want to start their own companies.

COSMIC PROBLEMS WITH NEBULOUS SOLUTIONS

Bannova is at no risk of running out study topics. The “research interests” section of her bio reads like a Star Trek script, calling out topics like “inflatable hydroponics laboratory and logistics modules” and “special design influences and requirements for different gravity conditions in space.”

Lately, her mind has been occupied with how we may protect human beings from space radiation.

Whereas Earth’s atmosphere protects us from radiation produced by the sun and exploding stars thousands of light years away, the moon does not enjoy the same defense. NASA is planning new trips to the moon with ambitious plans to have astronauts live on the lunar surface for months. But so far, little is known about the effect of prolonged exposure to space radiation.

Bannova plans to present a paper on the topic soon. “It explores different methods of how radiation protection

> “Since its founding 20 years ago, the program has been developing new ways to prepare students for a career in the industry.

could be integrated with the structures and architectures on the moon and Mars,” she says. Radiation protection, Bannova explains, would be a major development.

So would, for that matter, significant improvements to propulsion systems that reduce the travel time between Earth and the moon or Mars. “Faster is better,” she says.

And then there’s sustainability. Bannova is mindful of how any structures human beings may put on planets will interact with their environment long after they have served their purpose and become obsolete.

“Stuff starts growing, and there are materials in the walls that will seep into the atmosphere,” she says. She wants the key players to think about the lifecycle of new structures as a closed loop, eliminating waste. “Thinking about, start to end, how they can be utilized for a variety of different purposes in the future.”

Just what those purposes are will depend on how technology advances. Barron Hilton may have been sure that life on the moon was inevitable. But Bannova is taking it day by day.

“It’s heavily dependent on the technology,” she says, “and on the next big discoveries.”

Students Paolo Mangili and Vittorio Netti preparing for a mixed reality space walk.

PEPPINO

LASTING IMPACT

UH alums take a trip down memory lane and reflect on five of UH's favorite professors.

Michael Newman

"The man who taught me to do my taxes: Dr. Newman! Seriously, it should be required for all students to take his individual taxation class."

Sarah Terrell ('05)

Brené Brown

"Her class was so authentic and reaffirmed me as a social worker."

Dryia Taylor ('09)

Elizabeth Brown-Guillory

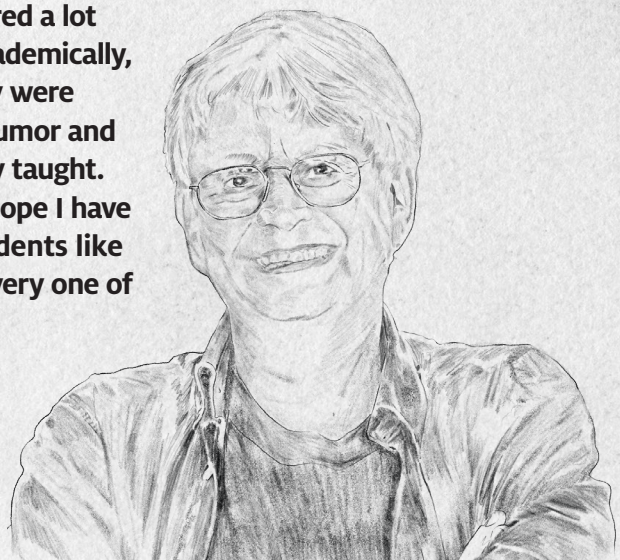
"Elizabeth Brown-Guillory (no relation). She was an English professor and playwright. She helped organize the African American literature program in the late 80s and early 90s at UH."

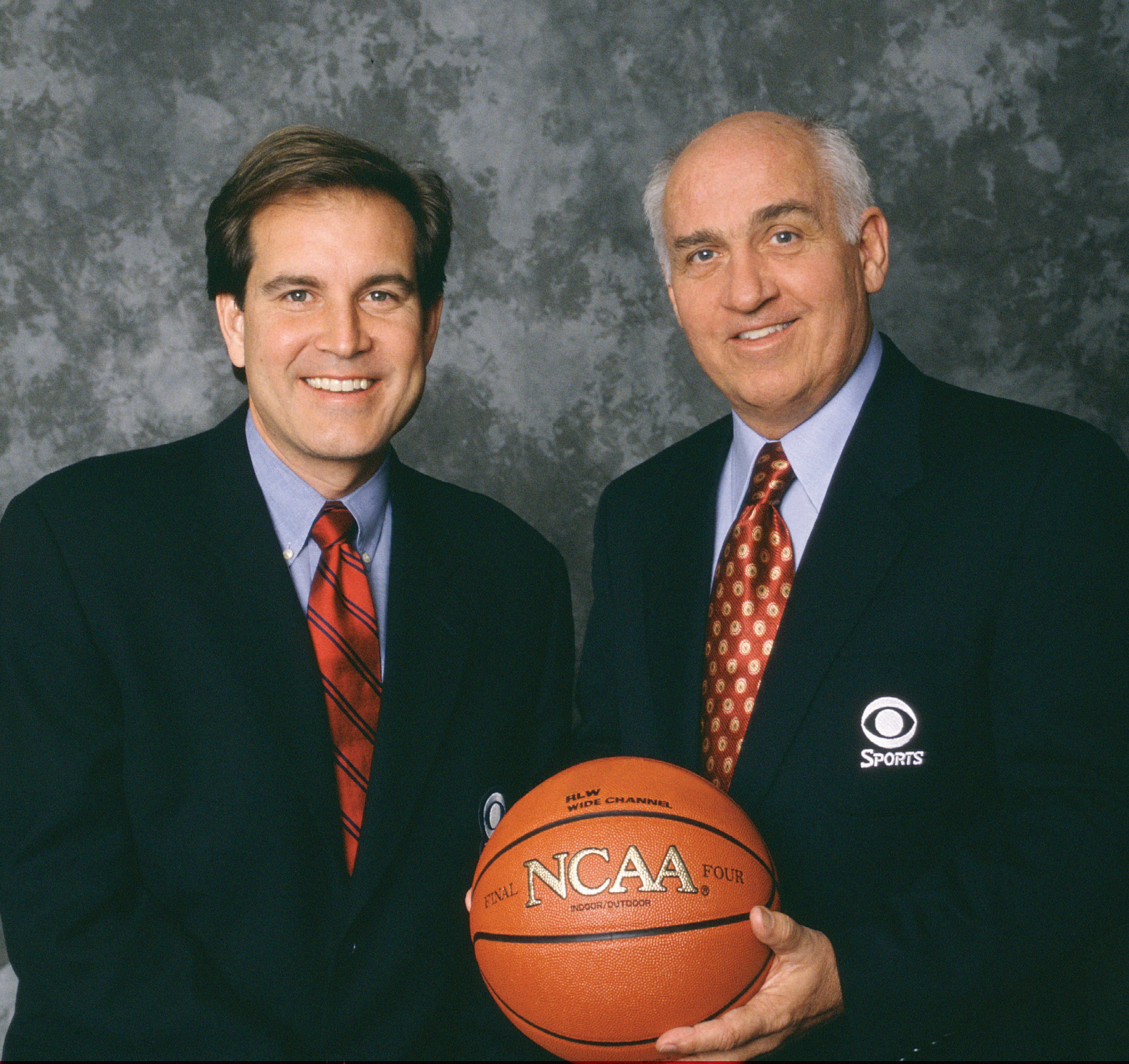
Gladys Denise Brown ('91)

Craig Crowe & Simon Bott

"Craig Crowe and Simon Bott both cared a lot about the success of their students academically, but more importantly as humans. They were amazing leaders, had great senses of humor and had so much passion for what they taught. I'm a teacher now and truly hope I have an impact on these students like they did on me and every one of their students!"

Shannon Rai Rogas ('14)





COLUMNS

BAUER
C.T. B

EMPOWERING TOMORROW'S ENTREPRENEURS

The SURE program allows students to gain the hands-on experience employers look for while uplifting the local economy alongside Houston entrepreneurs.

By Professor Saleha Khumawala, as told to Shawn Shinneman

In the early 2000s, not long after I'd taken a group of students to explore the work of nonprofits in my native India, including in the slums of Mumbai, one of them walked into my office with a proposition. He wanted me to teach him the world of microfinance.

I knew that project-based work—not textbooks—was the way to grasp the market, and we soon had him enrolled in an independent study. What I didn't realize at the time was that his inquiry was just scratching the surface of the interest across the C. T. Bauer College of Business.

Some 20 years later, that one independent study has slowly evolved into a thriving program named SURE—Stimulating Urban Renewal Through Entrepreneurship. The SURE program, which was founded in 2012, receives some 1,000 applications each year from under-resourced entrepreneurs across the Houston area, about 120 of whom are admitted to the program and paired with MBA student-mentors from the College of Business.

LEARNING TOGETHER

The SURE program creates a symbiotic relationship that's incredibly valuable for both sides. Throughout the semester, I make it a point to address our students as consultants. That's what they put on their resumes, which has proven to be a differentiator during interviews. And they are consultants in the truest sense of the word. Each student-consultant takes on three or four businesses in an active learning "classroom," where they sit together with entrepreneurs at round tables, discussing real ideas and working to solve genuine business problems.

The local entrepreneurs they're helping come from all walks of life, but they're connected by the fact that they lack some key drivers of business success—education, a network and access to capital. SURE provides all three.

We start each semester with lessons on financial literacy to help the group of entrepreneurs get their personal accounts and habits in order, creating a stable base for their company. We then empower their business efforts with financial education and skills training. At the end of the semester, we run a pitch day that is a more friendly fish tank than Shark Tank. We call it "Aquarium."

Entrepreneurs inevitably end up exchanging cards with bankers and investors who serve as the event's judges. Rounding out the cohort's new network are the executives who volunteer their time to mentor our consultants; they are present and often willing to hold court with hordes of entrepreneurs and students alike.

It has been incredible to watch how the community has banded together around our efforts. In addition to the executives, several law firms provide pro bono legal advisement as our entrepreneurs set up limited liability companies and navigate the specific regulatory waters of their industries.

> "It's proof that we all benefit when we create a more inclusive business ecosystem."

ENSURING SUCCESS

Through the SURE program, we've helped launch more than 725 businesses. Imagine the number of jobs and revenue that have been generated from those 725. I'm so proud of the imprint we're leaving on Houston. It's proof that we all benefit when we create a more inclusive business ecosystem.

But I may be even prouder of the nonnumerical indicators of success, the less measurable but every-bit-as-real impact at an individual level. There's always a point in the semester when things begin to click for our cohort—when the mentorship and training meet real confidence and a sense of self. It's the way our entrepreneurs are uplifted both socially and emotionally that is so incredible to see. They're able to go back home and tell their networks they go to the University of Houston. We have a graduation each year with prominent speakers and attendees, from the mayor to former high-ranking state officials.

Some people have asked whether I consider it a failure to go through our program and not come out with a viable business. I very much do not. According to the Bureau of Labor Statistics, one in five businesses fail within their first year of operation. Our mentorship allows folks to understand what it will take to make their idea a reality and whether the juice is worth the proverbial squeeze. There are many times when they decide it is not. But in my opinion, they still benefit greatly from the guidance and network and may soon find another venture that is more profitable or more conducive to their way of life.

As interest in our program grows, I'm excited about how SURE will evolve. One year ago, we established an academic center of excellence called the Musa and Khaleda Dakri Center for Economic Inclusion on campus. It houses the SURE program, but we're now also doing cutting-edge research on the intersection of small business and higher education. Many people can tell you what number of businesses fail, but there's not enough research into the drivers of that failure. That's the gap we're working to bridge.

The SURE program was built on our students' empathy. Who knew that one trip to India two decades ago would set the wheels in motion to create this thriving community?

The SURE PROGRAM

Stimulating Urban Renewal Through Entrepreneurship

1,000
Applications received yearly

120
Businesses admitted yearly

725
Businesses launched since 2012

SPACE IS COOL. BUT IT'S NO REPLACEMENT FOR OUR HOME PLANET.

UH alum and astronaut Aki Hoshide gives us a glimpse into his space missions and thoughts on the future of space travel.

By Aki Hoshide as told to Alexandra Clark, Illustration by James Weston Lewis

Imagine planning your summer vacation 10 years from now: Will you go to Paris? Cape Town? Maybe to a space station? I am an astronaut with the Japanese Aerospace Exploration Agency and a graduate of the University of Houston's Cullen College of Engineering. I encourage you to take seriously option number three. You may well have the chance to journey into space within your lifetime.

I was born and grew up in Japan but spent a few years in New Jersey when I was small. For summer vacation one year, my dad took me down to Kennedy Space Center in Florida. I was hooked and started dreaming of becoming an astronaut.

Years later, I applied to join the Japanese Aerospace Exploration Agency (JAXA) as an astronaut, but I lacked certain qualifications. So, after graduating college, I joined the agency as an engineer instead. A few years into my career, I still had my eye on becoming an astronaut, and I asked for a year off to earn a master's degree and fill my knowledge gaps. My boss approved the request on the condition that I continued supporting JAXA astronauts in Houston while I earned my degree. (JAXA was busy at the time, and we have a Houston office that collaborates substantially with NASA's Johnson Space Center.)

It was a deal. I worked at JAXA's Houston outpost and studied at the Cullen College of Engineering, which was

Aki Hoshide and his crew underwent extensive training before their launch, ensuring they could handle their own station maintenance and medical needs.

PHOTOS COURTESY OF NASA

great, because many of my classmates were in the space program. I still run into those old classmates and get to share in their experiences. It's something special.

And—with study and perseverance—I became an astronaut at last.

I now have three space missions under my belt. The first was a two-week shuttle mission. The second was a four-month International Space Station mission. And the latest was a 200-day mission to the ISS, during which I served as station commander. I returned home in November 2021.

Space station missions have a small crew—seven of us on my latest trip. We undergo extensive training together before we leave. We learn mission-specific skills: space walks, robotic arms and the relevant science. We also train so that we can handle our own station maintenance and medical needs. There's no doctor or mechanic just down the block when we're in space.

And we learn a philosophy of teamwork. If something fails, if someone has a need, whomever is available immediately addresses the issue. An alarm goes off, and we take action. The space station is large enough that crewmates might not see each other during the workday. Speakers and communication devices throughout the station allow us to hear each other, so we're alerted when a crewmate needs assistance. The crew on my latest mission excelled when it came to helping each other out.

Science is primary on the space station. As a crew, we take on various tasks from morning through afternoon, and every day is different. On this last mission, I performed more than 100 experiments across various specialties—medical science, biology, material science, fluid mechanics and Earth observation. We're developing technology to travel to the moon and to Mars. There's a lot going on.

It's hard work, but it's not all work. The seven of us had a great time together—movie nights and lots of laughs. As commander, I was looking out to make sure that everyone was comfortable and felt well cared for. There's also a strong support structure on the ground that ensures we're doing okay with the isolation, communicating with our families and feeling psychologically strong.

The brilliance of space travel is worth the time away. I think back to what a huge impact space travel had on the first astronauts. Even today, each of us who gets to travel into space experiences a shift in perspective. At one point on this latest trip, I was looking into the vast darkness of space, admiring it all, when suddenly I felt I was getting sucked into outer space. It was frightening. I was inside the space station—nothing was happening to me—but I had the fearsome sensation that space is just a huge black hole. Then I looked down at Earth, so comforting and reliable.

> "The brilliance of space travel is worth the time away."

At that moment, I felt—didn't think, but felt—that without Earth, we cannot live away from the planet. I'm a big believer that humankind needs to go explore and that, eventually, we will journey into space. But it can only happen if we have Earth, have it safe and sound. In that moment, I felt immense appreciation for Earth as home. Back on Earth now, I try to be ecologically correct. I think about my impact on the environment more since returning from space.

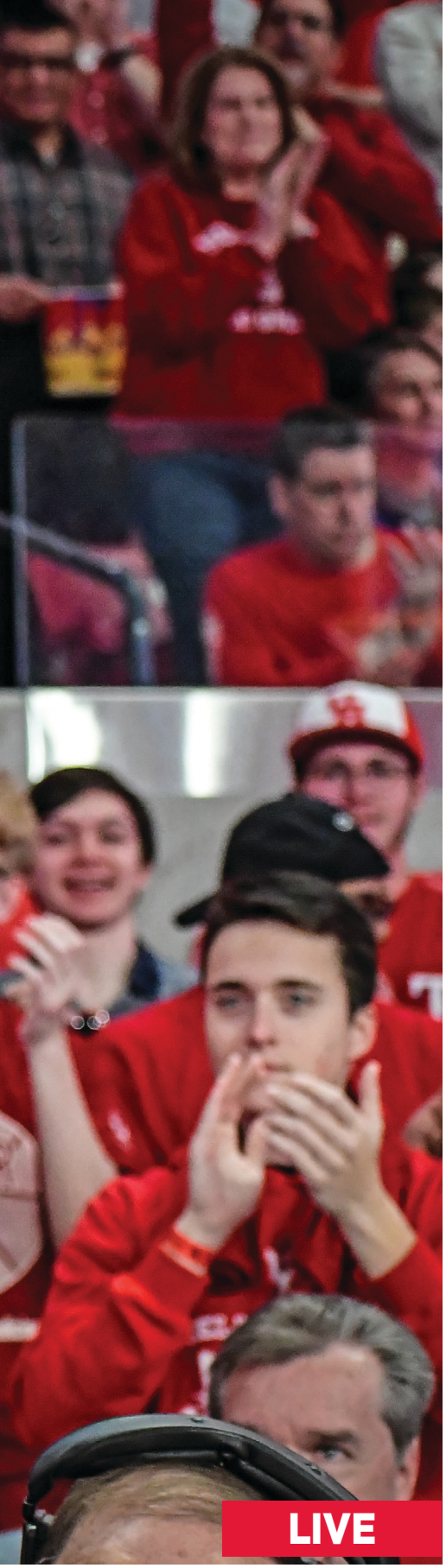
Space travel is an experience I recommend to anyone. Commercial space stations may be a reality within the next 10 years. Fifty years ago, it was prohibitively expensive to travel abroad, and very few people went overseas. But now it's common to visit different countries and to experience foreign cultures. I hope it will be like that with space; we in the profession are happy to support increased space travel.

Should you make the journey if you can? Absolutely, you should. You can't escape gravity in Paris!

Aki Hoshide is an engineer, Japanese Aerospace Exploration Agency astronaut and former commander of the International Space Station. He earned his Master of Science in aerospace engineering from the University of Houston Cullen College of Engineering.

SPORTS UPDATE

JIM NANTZ'S REMARKABLE JOURNEY FROM A UH STUDENT ATHLETE TO RENOWNED SPORTS COMMENTATOR IS A STORY OF DREAMS AND DEDICATION.



HELLO FRIENDS!

By Jim Nantz as told to Steven Miller, edited by Sam Eifling

My whole life launched as a student athlete at the University of Houston. A golf pro I knew named Ron Weber called Dave Williams, the legendary Cougars golf coach. Ron told Coach Williams that I had some game—but I really wanted to study sports broadcasting. Coach Williams watched me play a nine-hole round at The Woodlands. Afterward he said, "Jimbo, I would love you to be a Houston Cougar." That invitation was one of the greatest gifts I've ever received. To this day, it has profoundly affected everything else in my life.

It so happened that I was the worst player on the golf team. When I enrolled in the fall of 1977, we were coming off a national title—the 13th among 16 titles the team won in just 30 seasons. I contributed little to the cause, but I got to be around a group of competitors, winners. They exuded positivity, and we fed off one another. One of my roommates was Fred Couples. He said he hoped one day to win the Masters.

"I don't see why that can't happen," I told him. "You've got a game suited for that course. You have the passion. You have the ability." I knew his path wouldn't be mine, exactly. But I often said that I wanted to work for CBS one day, and my teammates in turn made me feel that was completely attainable. They helped me get there.

The world had a much different feel when I was a kid in Houston—very spacious and faraway. Watching live sports on television made me feel closer to distant places and to people from different cultures. I was awestruck at the ability sports announcers had to tell a story, to take me to places I only dreamed of visiting. They shrunk the world. The University of Houston in turn opened it up to me.

Jim Nantz (center) is surrounded by his fellow UH Athletics Hall of Honor members, renowned coaches of UH's past. L-R: Rolan Walton, former baseball head coach; Dave Williams, former men's golf coach; Bill Yeoman, former football coach; and, Guy V. Lewis, legendary men's basketball coach.

My entryway to the business was the basketball program. Dave Williams introduced me to Guy Lewis, the basketball coach who spent more than 30 seasons at Houston during his Hall of Fame career. He asked me to be the public address announcer at home games. Soon, as a sophomore, I was hosting his television show, which we produced on-campus for the local NBC affiliate.

I was in school at the beginning of the Phi Slama Jama era, when the team went to three straight Final Fours, and I'm still friends with so many of those players. I was the first to give Clyde "The Glide" Drexler his nickname. To see the program reach No. 1 again under Coach Kelvin Sampson for the first time in 40 years brought my heart a lot of good. It feels like my youth all over again.

I was working professionally in Houston while still in school, and a year after graduation, I moved to Salt Lake City for the chance to do play-by-play. I always knew I wanted to call games—the Super Bowl, the Final Four, the Masters—rather than remain a studio host running highlights. I figured I'd come back to the Houston market once I had some game experience. Then, life took a turn. In August of 1985, CBS called, out of the blue, and invited me to audition for a role. I passed the audition and the network hired me. By 1986, there I was in Augusta, anchoring coverage of the Masters. Fred Couples tied for 10th that year—and, sure enough, not long after, in 1992, he won it.

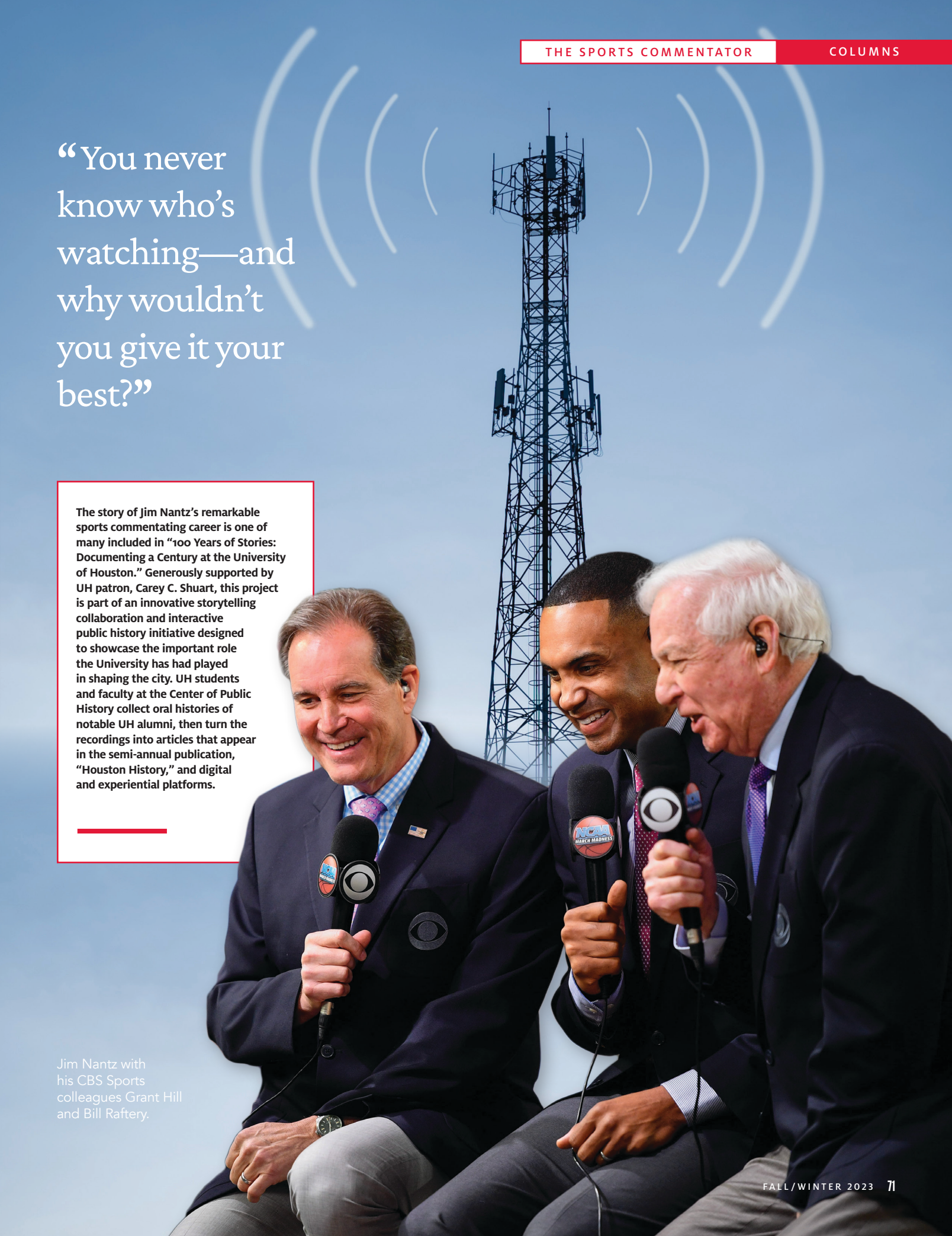
I like to think it doesn't matter whether I'm calling the Super Bowl for an audience of 150 million people or calling the lowest-rated golf tournament of the year. I'm going to give it the same effort. You never know who's watching—and why wouldn't you give it your best? You get to a point in your career where you trust your instincts and experience takes over. You just go do what you're trained to do.

I was part of the Final Four for 37 years. Now it's time for someone else to get that opportunity, and for me to spend more time with my family. Broadcasting can be strangely isolating. When you look into the camera, at those millions of people, you see only the lens looking back. For the longest time, whenever I was on camera, I focused myself by imagining I was speaking to just one person—my father. When he was suffering from Alzheimer's, I told him to listen for me to open the broadcast with the line "Hello friends." That was my special signal to him, to let him know that I was thinking of him and that I loved him.

It's freeing to imagine you're speaking to your family, to your friends. That kind of closeness and community in your life truly can take you anywhere you can imagine.

“You never know who’s watching—and why wouldn’t you give it your best?”

The story of Jim Nantz’s remarkable sports commentating career is one of many included in “100 Years of Stories: Documenting a Century at the University of Houston.” Generously supported by UH patron, Carey C. Shuart, this project is part of an innovative storytelling collaboration and interactive public history initiative designed to showcase the important role the University has had played in shaping the city. UH students and faculty at the Center of Public History collect oral histories of notable UH alumni, then turn the recordings into articles that appear in the semi-annual publication, “Houston History,” and digital and experiential platforms.



Jim Nantz with his CBS Sports colleagues Grant Hill and Bill Raftery.

CREATING PLASTICS WITH A PURPOSE

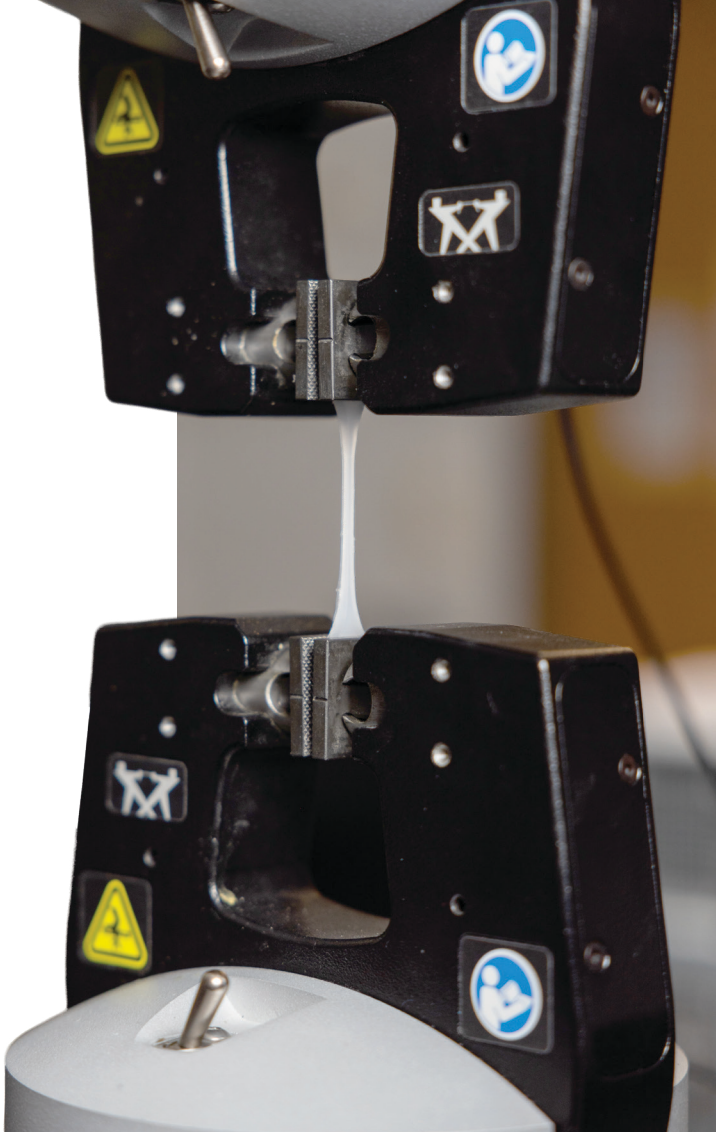
Thanks to a $4M grant from the Welch Foundation, a UH research team is working to change how plastics are manufactured and recycled.

Most places now have prominent recycling bins for glass, paper and plastic. The problem is that almost none of that plastic actually gets recycled. A 2022 Greenpeace report found that, at most, only 5% of plastic gets recycled (a percentage that continues to drop). The remainder ends up in landfills or incinerators to keep the rest of your trash company. While some may vilify the prevalent use of plastics, these materials provide enormous benefits to society in food preservation, water filtration and health care. The reason so much of it goes unrecycled comes down to the disparate chemical components of various plastics, which currently cannot be recycled together. Additionally, the loss of performance of the materials that occurs during recycling means they often cannot be repurposed into the same products that they started in.

Megan Robertson, a professor in the University of Houston Cullen College of Engineering, is leading a research team to address these challenges. With a $4 million grant from the Welch Foundation, she and her team of six faculty members, including professors Alamgir Karim and Ramanan Krishnamoorti from the Department of Chemical and Biomolecular Engineering, and professors Brad Carrow, Olafs Daugulis and Maurice Brookhart from the Department of Chemistry, will collaborate on the project, along with more than 20 students and post-doctoral researchers. Their mission? To develop new chemical paradigms that will revolutionize our approach to recycling.

The project, titled "Enabling Polyolefin Circularity Via Chemical Functionalization, Compatibilization, and Upcycling," embarks on three separate efforts that Robertson and her team expect will enhance recycling practices without losing the very properties that make plastics so beneficial.

"We know there are numerous benefits of plastics and what they do for society, but we need to address their limitations in a way that's better for the environment," Roberston says. In particular, the team will focus on a class of plastics called polyolefins, such as polyethylenes and polypropylenes, which represent more than 60% of all U.S. plastics but have dismal recycling rates.



Researchers use this tensile tester to characterize the mechanical properties of the plastics, indicating how strong, stiff and/or tough the materials are.

COMPATIBILIZATION

The first goal is to tackle the issue of compatibilization. As Robertson explains, the current plastic recycling process involves heating the material until it becomes liquid, then reforming and cooling it in pellets ready for the manufacturing pipeline. But first, recycling centers must sort the plastics based on molecular composition. Otherwise, the different plastics won't mix—much like oil and water— unless a stabilizing agent is added. Robertson and her team have identified polymer molecules that can be added to the plastic waste as needed, allowing diverse plastics to be recycled together, without the need to separate them.

"On any given day, recycling facilities don't know what they'll be dealing with. Having modular compatibilzers that can be mixed and matched as needed to the types of plastics coming into the recycling facility would keep the process moving without the extensive sorting that is required currently," she says.

UPCYCLING

The second focus of their research is on upcycling: converting single-use plastic waste into long-lasting, value-added products, thus extending their lifespan outside of landfills. To do this, Robertson's team is working to convert plastics into thermosets, particularly polyurethanes used in insulating foams, coatings, furniture and infrastructure materials.

"What we're trying to do is make the plastic more functional by running it through a commercially-relevant process involving extrusion that turns the plastic into a thermoset. This type of thermoset is used for durable products that have a longer life and greater consumer value than the types of plastics used for food packaging, as an example, which end up in landfills much faster," Robertson says.

DEGRADABILITY

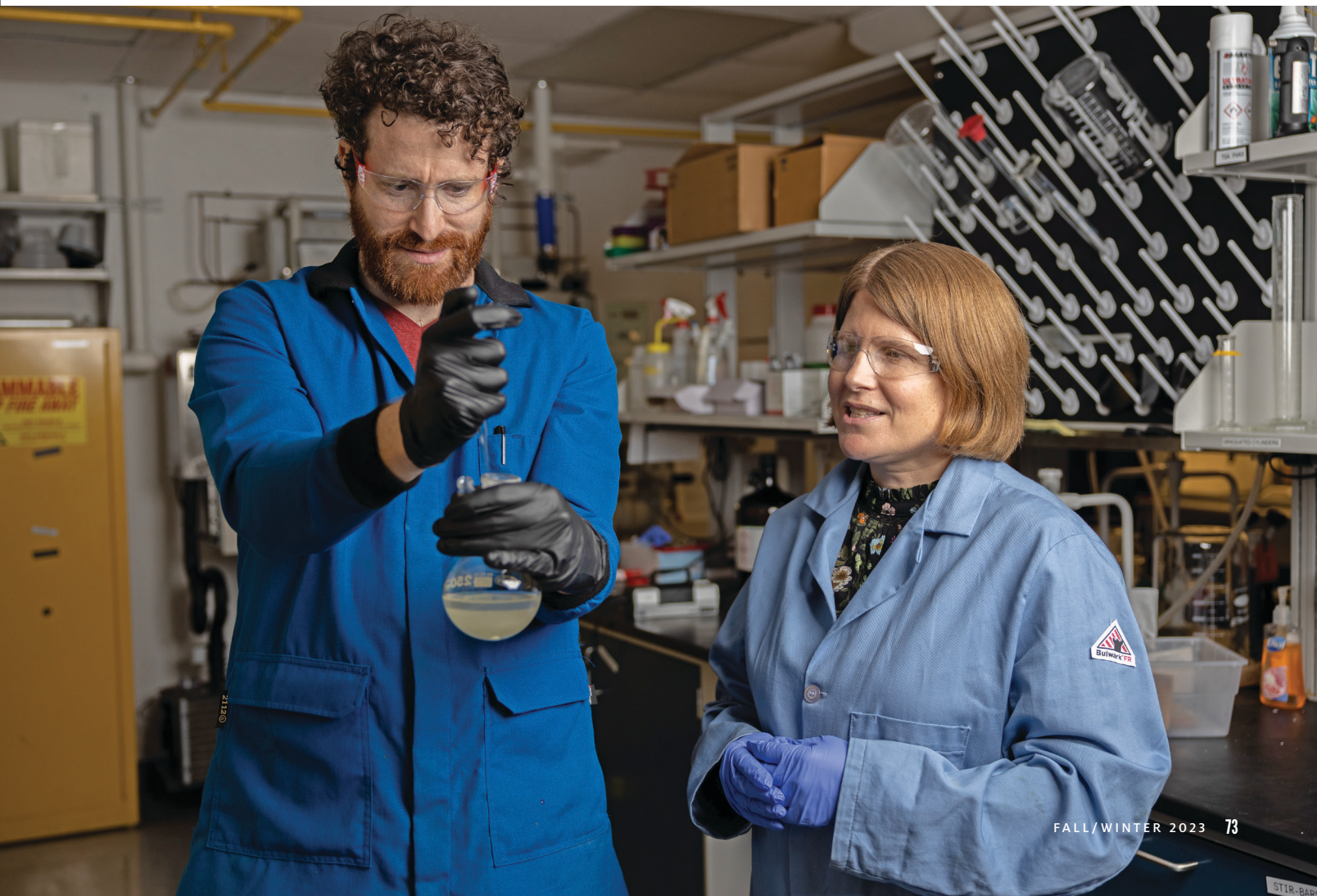
A more recent approach, called chemical recycling, breaks the plastics down into monomers (the building blocks of polymers), which can then be used to make the polymers again. This is a circular process, as the same polymer can be broken and reformed many times over. Because polyolefins are highly stable, they are very energy-intensive to break down chemically, which, as Robertson notes, makes it difficult to apply chemical recycling processes to these types of polymers.

Their plan, simply stated, is to create degradable polyolefins that retain their original qualities and functionality, but that can be recycled and reused through this chemical recycling approach.

"Think of it like a loop: instead of making plastic, using it and then trashing it, instead we can create a circular economy aimed to keep the same plastic in circulation for as long as possible while simultaneously retaining its value and avoiding chemical leakage into the environment," Robertson says.

In total, Robertson and her team plan to introduce these three approaches to enhance current recycling practices and envision a future in which plastic waste is converted into useful products and kept out of landfills.

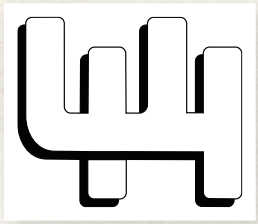
Postdoctoral Reseach Associate Justin D. Smith and Professor Megan Robertson



UH'S LOGOS OVER THE YEARS

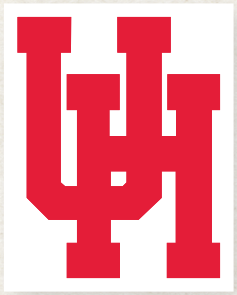
While the look may have changed, it's always been True UH.

Founded as a junior college in 1927, the University of Houston officially became a university in 1934. As UH has evolved, so has its logo.



1930s

The University's first official logo was a version of the interlocking UH letters we know and love today. The ice hockey team was the first to wear the bright red block letters in 1935.



1962-1996

In the 60s, UH returned to the early version of what would become its iconic "UH" logo. While many iterations would follow, this simple but striking, bright red logo was, and still is, easily recognizable and proudly worn.

1928

The first known logo of our beloved Cougar mascot, illustrated by Carroll Canatella for the Houston Junior College.

1951-1962

By the mid-century, UH's minimal logo had transformed into a stylistic depiction of a Cougar outstretched as if ready to pounce over the lettering "U of Houston."

2017-NOW

While our current "UH" logo is an ode to where the school started, it also shows just how far we've come. Today, our logo illustrates the school's forward-thinking mission while remaining rooted in what makes us "True UH." To read more about UH's logo evolution, visit stories.uh.edu/2022-true-uh/.

2000-2012

The University returned to its tried and true interlocked "UH" logo; this time, it took on an exaggerated look that was so popular during the 2010s.

1996-2000

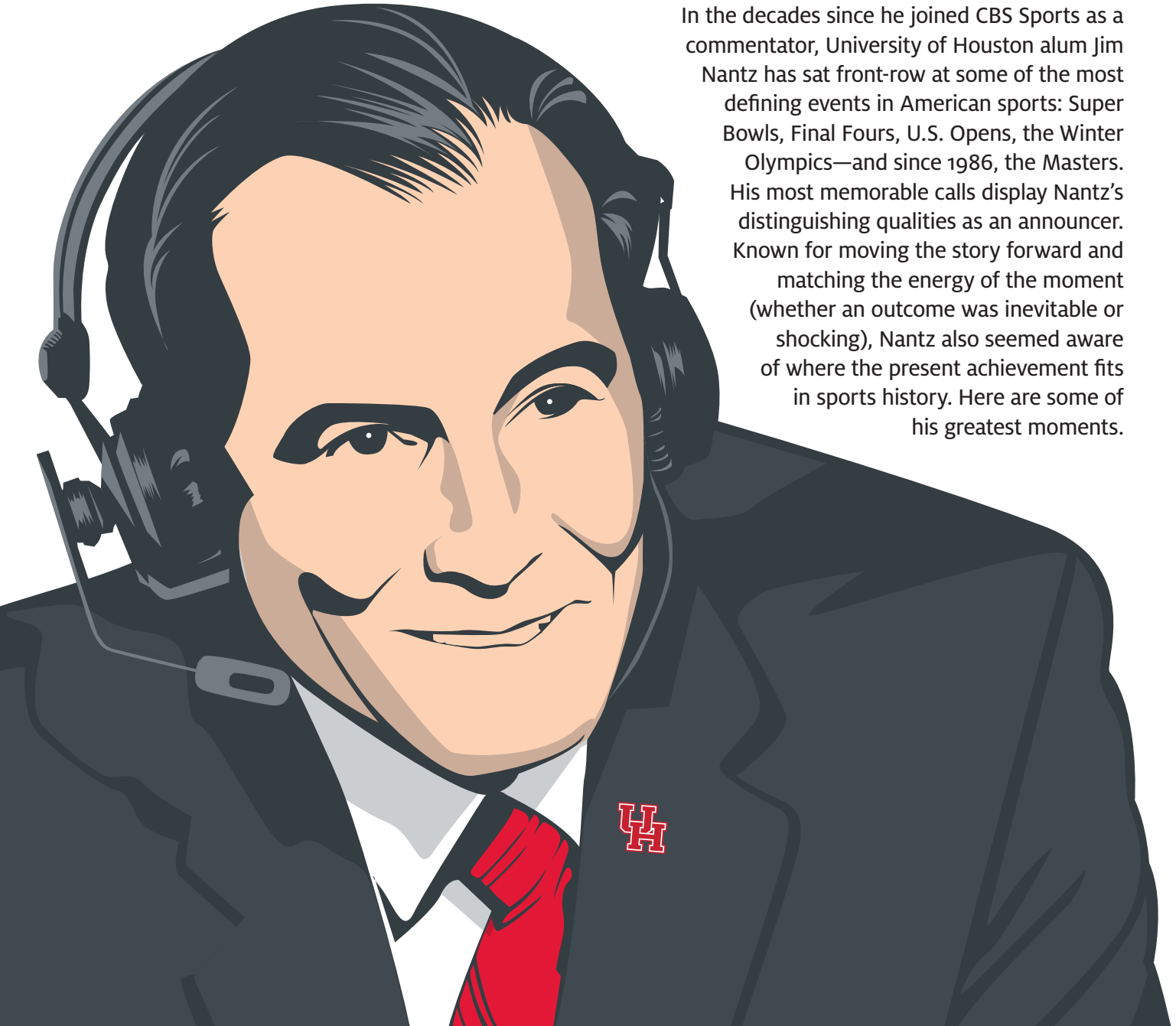
As we approached a new millennium, the school took a bold approach to its vintage Cougar logo. Shasta is facing directly forward over the "Houston Cougars" lettering with a determined gaze and fighting stance as if to say, "We are ready for whatever comes our way."

2012-2017

The school continued to refine the unembellished interlocking "UH" logo of the 1960s and re-envisioned it nearly 50 years later with a modern twist. For five years, Cougars donned this 3D design that introduced a secondary, darker red shade to UH's official school colors.

JIM NANTZ

CALLS ICONIC MOMENTS IN SPORTS



In the decades since he joined CBS Sports as a commentator, University of Houston alum Jim Nantz has sat front-row at some of the most defining events in American sports: Super Bowls, Final Fours, U.S. Opens, the Winter Olympics—and since 1986, the Masters. His most memorable calls display Nantz's distinguishing qualities as an announcer. Known for moving the story forward and matching the energy of the moment (whether an outcome was inevitable or shocking), Nantz also seemed aware of where the present achievement fits in sports history. Here are some of his greatest moments.

Rodgers. In trouble. He turned 32 yesterday—does he have a vintage moment in him? In the end zone—it is caught!

FOR THE WIN!

Richard Rodgers! With a walk-off touchdown!

Aaron Rodgers of the Green Bay Packers throws a 61-yard Hail Mary to Richard Rodgers II to beat the Detroit Lions, 2015

Three seconds. At midcourt. Gets it to Jenkins! For the championship! Wow! Villanova! Phenomenal! The national champions! With Jenkins hitting the winner

AT THE BUZZER!

Villanova beats North Carolina for the NCAA men's basketball championship, 2016

There it is!

A WIN FOR THE AGES!

Tiger Woods, at 21, makes his final putt to win the Masters by a record 12 strokes, 1997

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