

# ASU

ARIZONA STATE UNIVERSITY  
VOLUME 24 NUMBER 1

**Thrive**<sup>®</sup>

2020

## Year in review

Highlights from another year of innovative breakthroughs

**PLUS**

### ENTREPRENEURSHIP

ASU startups make a difference in Arizona and around the globe

### LEARNING THROUGH LIFE

IMMERSIVE LEARNING

# Exploring new worlds

From an alien zoo to the red rocks of Mars, how students will learn in 2021 (and beyond!)

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## Contributors

**Jamaal Abdul-Alim**

An award-winning education journalist whose articles have appeared in publications from The Wall Street Journal to U.S. News & World Report.

**Craig Guillot**

A business journalist, his work has appeared in The Wall Street Journal, Forbes, Chief Executive and Entrepreneur.

**Johnathon Kelso**

An editorial photographer, his work has been published by Atlanta Magazine, Bloomberg Businessweek, The New York Times, The Guardian and NPR.

**Jennifer Kite-Powell**

A senior technology contributor at Forbes.com, she has been named one of the top 100 women in technology in Europe in 2012, and shortlisted for best tech journalist by the TechCrunch Europas Awards.

**Courtney Lively**

A Scholar All-Region Athlete on the soccer team, she graduated in '07 with a BIS in interdisciplinary studies. As an event and brand photographer, her clients include Deloitte, Google and others.

**Jeff Newton**

An editorial and commercial photographer, his clients include Google, adidas Originals, The New York Times and more.

**Paul Tullis**

A science and technology writer, he has written for The New Yorker, The New York Times Magazine and National Geographic and has won awards from the Society of Professional Journalists, and the Society of Environmental Journalists.

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**CHIEF CREATIVE OFFICER,  
PUBLISHER**  
Jill Andrews '97 BS, '03 MPA

**SENIOR DIRECTOR,  
EDITOR**  
Lindsay Kinkade

**SENIOR ART DIRECTOR**  
Heidi Easudes

**FEATURES STORY EDITOR**  
Kari Redfield

**SENIOR CONTENT MANAGER**  
Melissa Bordow

**ART DIRECTOR**  
Danielle Knotts

**PHOTOGRAPHER PRINCIPAL**  
Jarod Opperman

**DIRECTOR, NEWS AND STRATEGIC  
COMMUNICATIONS, ASU NOW**  
Penny Walker

**COPY EDITOR**  
Leigh Farr

**PRODUCTION**  
Chris Myers

**STORY IDEAS AND  
ADVERTISING INQUIRIES**  
[asuthrive@asu.edu](mailto:asuthrive@asu.edu)

**ASU THRIVE MAGAZINE**  
PO Box 875011  
Tempe AZ 85287-5011, 480-727-5440  
[asuthrive@asu.edu](mailto:asuthrive@asu.edu)  
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# Forging what's next

I am optimistic about the future and confident that Arizona State University will lead the way in making higher education more relevant, flexible and accessible to learners of all ages.

A big reason for my optimism is the growing body of engaged supporters who commit financial resources to advance ASU's mission. In the past decade, 353,650 alumni and ASU supporters around the world contributed to Campaign ASU 2020, a fundraising effort that raised more than \$2.3 billion for ASU students, faculty, community programs and research. That's an extraordinary accomplishment.

Because of generosity to ASU, student accessibility and excellence have never been higher; support for minority and low- and moderate-income students has never been greater. ASU's faculty is better equipped to create new knowledge across disciplines and without barriers. And ASU's talents and resources are contributing to the health of our communities and are a force for social progress and economic growth. A few examples of generosity that fuel my optimism:

- Thanks to a \$12 million gift of insect specimens, ASU is a leading center for understanding weevils, an insect group that is inspiring new materials exploration through biomimicry.
- A compact version of one of the most powerful X-rays in the world, being developed at ASU's Bidesign Institute, will allow researchers to peer into the atom and see molecules in action. This technology will enable new medicines and modes of clean energy. A \$10 million gift enabled a world-class lab for the technology.
- More than \$256 million in new scholarship support has been disbursed to students across the university.

Campaign ASU 2020 has served as a springboard, positioning ASU to advance its reputation as the most innovative university in the country. As we look to a future full of promise, your partnership and support will continue to be as vital as ever.

**Michael M. Crow**

President, Arizona State University  
[asuthrive@asu.edu](mailto:asuthrive@asu.edu)



Thank you to all of our ASU supporters. This highlight is included throughout the magazine to spotlight stories in which donors' generosity played a pivotal role.

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COURTNEY LIVELY, JAROD OPPERMAN/ASU



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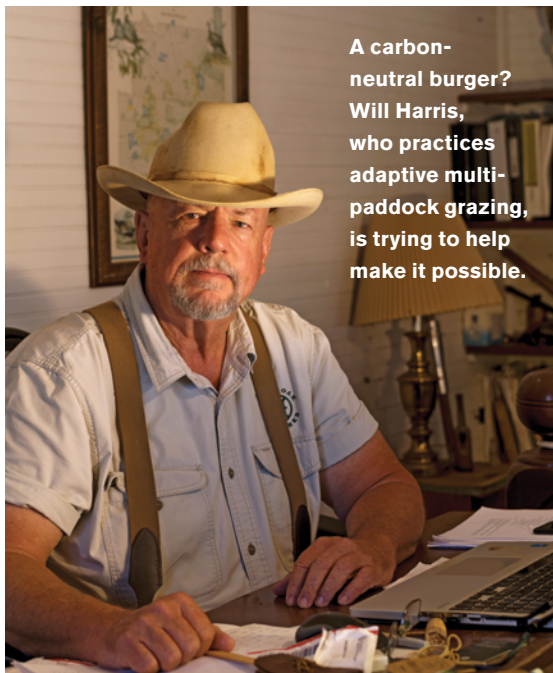
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JEFF NEWTON; JOHNATHON KELSO

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## Bassem Youssef – riding a wave of incredibly smart and hilarious global satire

Egyptian comedian Bassem Youssef, known internationally for hosting the popular TV show “AlBernameg,” brings his political satire to ASU Gammage. Throughout its three seasons, “AlBernameg” became the most popular television show in Egypt’s history, with an average of 30 million viewers each week. Currently living in the U.S., Youssef was named one of Time magazine’s most influential people, under the “Pioneers” category, and continues to challenge power with one of the most powerful weapons: humor.

**Saturday, Jan. 23, 7 p.m.,  
ASU Gammage, Tempe  
campus**

[asugammage.com](http://asugammage.com)

**Family** Ticketed



- Check for updates:** Information about event dates and times may have changed since the press date. Please check the provided websites for more information.



## Celebrate the impact of giving

A special YouTube Live event will celebrate the impact of Campaign ASU 2020, ASU’s universitywide fundraising campaign for ASU students, faculty, research and initiatives.

Enjoy stories of generosity and impact, through voices of students, faculty, alumni, community partners and donors. Experience a vision for the future of ASU.

Engage through interactive elements like chat and social media.

**Tuesday, Jan. 26, 5:45–  
6 p.m. pre-event  
slideshow**

**6–6:45 p.m. main  
celebration**

[asuevents.asu.edu](http://asuevents.asu.edu)

**Free** **Family** **Online**



## ‘Restless Balance: boredomresearch’

From the textbooks of ancient Greek physician Hippocrates to current research on the coronavirus pandemic, we know that human health is impacted by environmental factors.

Internationally renowned British artists Vicky Isley and Paul Smith of boredomresearch have collaborated with leading science institutions over the past decade to create dynamic video installations that explore how large-scale environmental changes have altered disease transmission. In 2019, they worked with researchers at the Arizona Cancer Evolution Center at the ASU Biodesign Institute on radically new ways of thinking about cancer treatment. This exhibition is the U.S. premiere of the resulting video installation, “In Search of Chemozoa,” along with three striking earlier works based on animated robots navigating Venice’s polluted canals, flight patterns of mosquitoes carrying malaria and intertidal snails adjusting to changed coastal conditions.

**Tuesday–Saturday, now through April 24, ASU  
Art Museum. To ensure the well-being of all our  
visitors and staff, please reserve free, timed-entry  
tickets and review guidelines for visiting.**

[asuartmuseum.asu.edu](http://asuartmuseum.asu.edu)

**Free** **Family** **Ticketed, reserved time**

**Thank YOU** “In Search of Chemozoa” was commissioned and funded by the Arizona Cancer Evolution Center, a new center established through an award from the National Institutes of Health/National Cancer Institute and housed at the Biodesign Institute at ASU. Supported by the Andy Warhol Foundation for the Visual Arts with support from the ASU Art Museum’s Evelyn Smith Exhibition Fund.

Feb.  
Feb.



## Exploring digital sovereignty and e-commerce

The 7th annual “Wiring the Rez: Innovative Strategies for Business Development via E-commerce” will explore the issues surrounding the development of rival digital sovereignty and e-commerce among American Indian nations. Attorneys, financiers, scholars, tribal entrepreneurs, as well as tax and cyberspace experts, are invited to gather to discuss e-commerce issues. Presented by the Indian Legal Program at the Sandra Day O’Connor College of Law, it will be hosted by Rosette LLP American Indian Economic Development Program.

Thursdays, Feb. 4, 11, 18, 25, 2–3:30 p.m., online

[law.asu.edu/wiringtherez](http://law.asu.edu/wiringtherez)

Free Online

## Open Door



Love dog discoveries, curious about rattlesnakes or want to know the science behind happiness? Step into ASU Open Door, a fun and interactive event that allows you to explore the spaces accessible only to ASU students — laboratories, living collections, museums and classrooms. Whether you’re a thrill-seeker, lifelong learner, science guru, art enthusiast or explorer, you can find a unique experience through Open Door.

Videos available on Monday, March 1 and throughout the year at [opendoor.asu.edu](http://opendoor.asu.edu)

Free Family Online

## Citizen Science Week

Join science experts at ASU and engage the whole family for fun and educational activities and opportunities.

Monday, March 1 to Friday, March 5, 8 a.m.–noon, online

[newcollege.asu.edu/citizen-science-week](http://newcollege.asu.edu/citizen-science-week)

Free Family Online

## Create a wellness journal

Learn how to capture stories in graphic form. Explore and draw your story through this easy, approachable medium. This workshop will also help you lessen stress and proactively manage self-care and mindfulness. No experience necessary!

Online on demand  
[asugammage.com/digitalconnections](http://asugammage.com/digitalconnections)

Free Family Online



**Thank YOU** This virtual master class is made possible with support from the Abbett Family Foundation.

Mar.

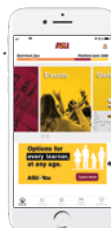


Through resources from the ASU Library, you can join Audubon Society citizen science monitoring efforts for hummingbirds, submitting data for sightings and feeding events you see in your own backyard.

Resources at [libguides.asu.edu/citizenscience](http://libguides.asu.edu/citizenscience)

## Check in to online events to earn Pitchforks and rewards!

Log in to the Sun Devil Rewards app for ASU event listings, news, games and more. Earn and be rewarded! [sundevirewards.asu.edu](http://sundevirewards.asu.edu)



Visit [ASUevents.asu.edu](http://ASUevents.asu.edu) for events at ASU.

Visit [TheSunDevils.com](http://TheSunDevils.com) for athletics event and ticket information.

## Free professional development for every teacher: Arizona Virtual Teacher Institute

Helping Arizona teachers thrive in the new reality where online instruction is a part of every school plan, the institute offers access to free training videos, online teaching resources and connections with fellow state educators for ideas and best practices.

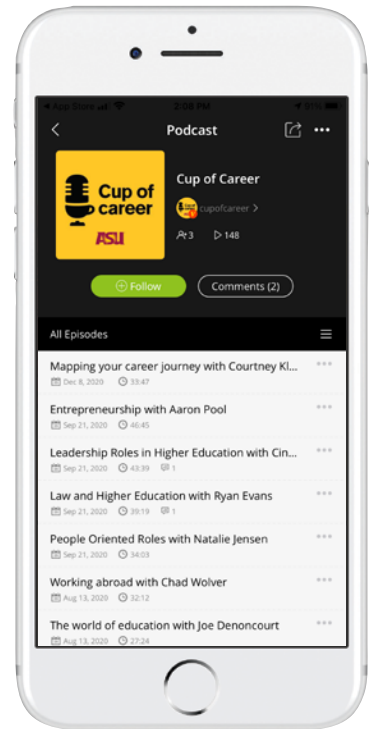


Topics include: online curriculum, learning management system, best practices in online instruction, setting up a virtual instruction plan, web 2.0 tools (web conferencing, plagiarism detection, etc.), live lessons, pace charts, setting up a home page, supporting students with special needs, creating supplemental resources and customizations, academic integrity and discussion-based assessments, preparing for "go live" with students, best practices for effective communication, monitoring student progress, building social presence, social and emotional learning in an online environment, teaching time and stress management.

Browse teaching resources  
[asuprepdigital.org/training](http://asuprepdigital.org/training)

**Thank YOU**

Supported in part by a grant from the Helios Education Foundation.



## Coffee and a great story of the real roads to success

The new "Cup of Career" podcast is a place where you can hear from successful alumni and follow their journeys to find out how they got to where they are today. Tune in to be inspired, learn tips and tricks and maybe even find the next book to put on your bookshelf. Pop in your headphones and learn why it's great to be a Sun Devil.

[cupofcareer.podbean.com](http://cupofcareer.podbean.com)

**Free** Lifelong learning **Online**

## Stay in touch

Update your info to stay in the know with invites to special events and more.

[alumni.asu.edu/update](http://alumni.asu.edu/update)

# Community



**"I took the me3 [quiz] and it popped up all these architecture programs. Now I have a good plan."**

– OMAR, HIGH SCHOOL STUDENT ON HIS PLAN TO GET READY FOR COLLEGE

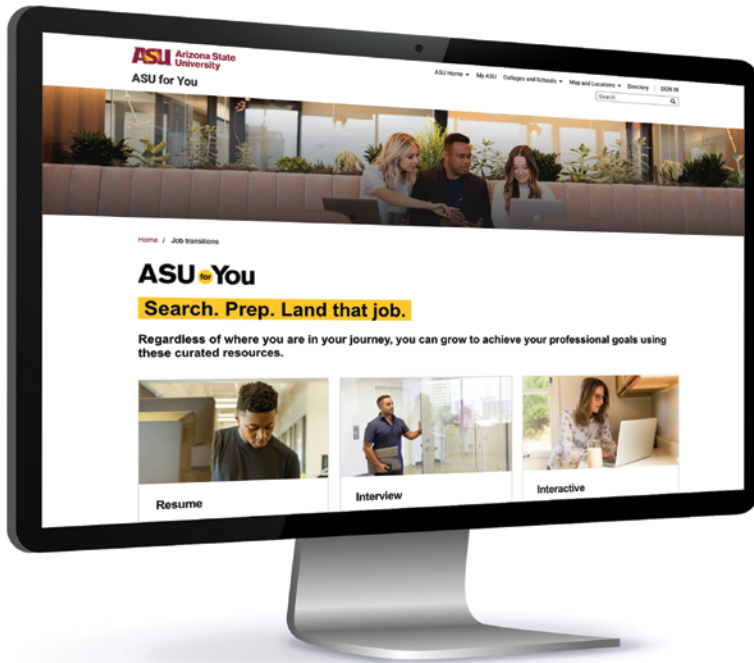


**me3<sup>®</sup> app's major and career quiz to find options students didn't know they had**

Find a major, degree program and career that fits you with the me3 online interactive quiz. Easily explore majors and future job options that fit your interests and passions. Design the future you want — chart an academic pathway to find the degree and career tailored to your unique interests.

Take the quiz at  
[yourfuture.asu.edu/me3](http://yourfuture.asu.edu/me3)





## Job transition resources to help land the new job

Regardless of where you are in your journey, you can grow to achieve your professional goals using these curated resources. Resources include resume support, interview advice, tips to build your online presence, insights about industry trends, networking and more.

[asuforyou.asu.edu/jobtransitions](https://asuforyou.asu.edu/jobtransitions)

## National Mentoring Month

We invite you to join the ASU Mentor Network to help build connections with alumni and non-alumni professionals, both local and global, ASU faculty and staff, and undergraduate and graduate students. The network is home to the Alumni Career Volunteers, a powerful group of 50 alumni who give their time to their alma mater through mentoring and career coaching.

Connect with the ASU Mentor Network at [mentorship.asu.edu](https://mentorship.asu.edu)

Free Networking Online

**“I owe so much of my life’s success to incredible mentors throughout my life. I think everyone deserves to have and to be a great mentor.”**

– ANGELICA VEGA-FOLEY, ALUMNI CAREER VOLUNTEER, VICE PRESIDENT OF PARTNER SUCCESS AT STRONGMIND, BA IN SOCIAL WORK/WOMEN’S STUDIES, MASTER OF PUBLIC ADMINISTRATION

**“There is something remarkably fulfilling about being present when someone you are mentoring discovers their own innate potential and is awakened to the possibilities before them.”**

– DIEGO GETTLER, ALUMNI CAREER VOLUNTEER, RELATIONSHIP DIRECTOR AT MOMDOC, BS IN BUSINESS ADMINISTRATION, MASTER OF BUSINESS ADMINISTRATION

## Advance your career in the new year

Want to take your career to the next level in the new year? Join the annual Career Mastery™ Kickstart Virtual Summit, featuring May Busch among 25 incredible experts from around the world sharing their latest insights and advice on how to be more successful in your career.

Monday, Jan. 25–Friday, Jan. 29, online

[careermasterykickstart.com/asu](https://careermasterykickstart.com/asu)

Free Networking Online

## From Passion to Purpose

Are you hoping to be in a career that you are passionate about and one that gives you purpose? Join Penny Allee Taylor from Valley of the Sun United Way along with other leaders in this industry from Teach For America, Aliento, and Chicanos Por La Causa.

Thursday, Jan. 28, 4–5:30 p.m., online

[asuevents.asu.edu/content/professional-perspectives-passion-purpose-0](https://asuevents.asu.edu/content/professional-perspectives-passion-purpose-0)

Free Networking Online



# Update in the news

## SUSTAINING EFFORTS

Phoenix artist Anthony "Eli" Farias, '14 BA in art, creates a chalk art installation celebrating butterflies as part of ASU's Campus Sustainability Month, in October outside the Sun Devil Fitness Complex on the Tempe campus.

## 'The Fifth Wave'

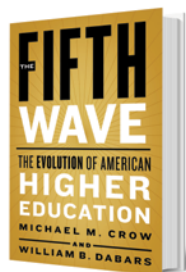
President Michael M. Crow's new book.

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## ASU Moms to the rescue

Providing care packages.

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## 'The Fifth Wave: The Evolution of American Higher Education'

In their latest book, Michael M. Crow and William B. Dabars argue that colleges and universities need to be comprehensively redesigned in order to educate millions more qualified students while leveraging the complementarities between discovery and accessibility. It examines the first four waves of development of American higher education and posits that what must emerge in the fifth wave are institutions that are responsive to student needs, focused on access, embedded in their regions, and committed to solving global problems through the seamless integration of world-class knowledge production with cutting-edge technological innovation.



## A new 'normal' body temperature

Have you taken your temperature recently? Was it lower than the standard 98.6 degrees Fahrenheit?

Research indicates "normal" body temperature has been steadily decreasing in the U.S. over the last 200 years, now hovering around 97.8 degrees. Similar trends were reported in studies from the U.K.

New research not only found the same decrease in remote populations of people living in the Bolivian Amazon, but the decrease in body temperature took place over a mere 20 years.

The study was published by a transdisciplinary team, including ASU anthropologist Benjamin Trumble. Their findings show rapidly decreasing body temperatures among the Tsimane people

living in remote communities in the rainforests of Bolivia.

General societal advancements may point to why we're seeing this trend. For example, in the U.S., body temperature started decreasing after the industrial revolution. Access to running water in people's homes and increased availability of medical care could lessen the prevalence of infection and disease and cause body temperatures to decrease.

These temperature studies could have major implications for global health. Our body temperature is easy to measure and can be used as an indicator of overall health. Both in the U.S. and in Tsimane communities, the decreased body temperature has coincided with increased life expectancy.



## Thunderbird global affairs program harnesses historic events of 2020

In ASU's first academic program based entirely at its Washington, D.C., location, an innovative graduate curriculum is giving the initial cohort deep insights into how to address the 21st century's most complex leadership challenges.

Thunderbird School of Global Management offers its Executive Master of Arts in Global Affairs and Management at the Ambassador Barbara Barrett and Justice Sandra Day O'Connor Washington Center at Arizona State University, a few blocks from the White House.

The EMAGAM, for midcareer and senior professionals in business, government and civil society, prepares graduates for leadership positions within their existing organizations or to make a bold move in their careers by switching organizations or even sectors entirely.

"Between the Fourth Industrial Revolution, climate change, and population growth, the 21st century is poised to see massive, complex disruptions that pose serious threats to our global civilization's ability to prosper," Thunderbird's Director General and Dean Sanjeev Khagram says.



"Layered on top of that, COVID-19 has revealed a global need for expertise in managing systemic hazards. Our EMAGAM is designed to leverage everything the nation's capital has to offer to teach just this type of expertise," Khagram says.



## Storing information and designing uncrackable codes with DNA

For billions of years, nature has used DNA like a molecular bank vault: a place to store her most coveted secrets — the design blueprints essential to life. Now, researchers at ASU's Biodesign Institute are exploring the unique information-carrying capacities of DNA, hoping to produce microscopic forms whose ability to encrypt, store and retrieve information rival those of the silicon-based semiconductor memories found in most computers. If successful, DNA-based storage technologies could one day encode everything from a string quartet of Beethoven to a season of "Westworld."

**Keep up with the headlines at ASU by subscribing to the ASU Now e-newsletter at [asunow.asu.edu/subscribe](https://asunow.asu.edu/subscribe).**



## ASU Moms group prepares hundreds of care packages for students in COVID-19 isolation

More than 200 members of a Facebook group called ASU Moms gathered to put together hundreds of care packages for ASU students who are isolating in their residence halls after a positive COVID-19 test.

Sue Rigler, who graduated in 1988 with a degree in microbiology and is the parent of a sophomore, reached out to the social media group, which is known for being a great source of support to Sun Devil families, to ask if they'd be willing to help collect and package supplies for students who might be feeling ill, bored or stir-crazy during the recommended 10 days isolating to prevent spreading COVID-19 after testing positive. Donations and offers to help poured in. More than 200 parents stepped up to provide beverages, meals, soap and shampoo, snacks, homemade activity books, jump ropes for an in-room exercise option, thermometers and a handwritten notes of support, signed "with love from ASU Moms."


**Families interested in getting involved can visit [family.asu.edu](https://family.asu.edu) to explore opportunities or reach out to [asufamily@asu.edu](mailto:asufamily@asu.edu).**

## CARBON CYCLE

**One of the world's driest deserts may help us understand our own backyard**

Carbon, one of the main building blocks for all life on Earth, cycles among living organisms and the environment. This cycle, and how it works in one of the driest places on Earth, is the subject of a new study recently published in the journal *Plant and Soil* with lead author and ASU scientist Heather Throop. While the natural carbon cycle should be balanced each year, with about as much carbon taken out of the atmosphere as is released back by natural processes, humans are upsetting this balance through carbon dioxide additions to the atmosphere, both through changing land use that releases carbon stored in soils and from burning fossil fuels. In an effort to understand what controls the release of carbon dioxide from soils in deserts, Throop and her team determined that subtle differences in surface topography and erosion have big influences on microorganisms in the soil and these differences may "help us in understanding how deserts respond to a changing climate," says Throop.

Learn more about Throop's research at [drylands.asu.edu](http://drylands.asu.edu).



**University students Ruusa Gottlieb (left) and Priscilla Mundilo measure carbon dioxide release from the soil at one of the high rainfall sites in the Namib Desert.**



Four actors appear in a 2016 production of “She Kills Monsters,” produced by the theater program in the Herberger Institute for Design and the Arts.

## Herberger Institute launches two new schools, reimagining music, dance, theater and film

The Herberger Institute for Design and the Arts is creating two new schools — the School of Music, Dance and Theatre and The New American Film School. They will replace the former School of Film, Dance and Theatre and the former School of Music.

Steven J. Tepper, dean and director of the Herberger Institute, says, “Our aim ... is to create a dynamic, collaborative unit that respects what each of the disciplinary faculties has achieved individually while inviting the faculty to think together to leverage their resources, talents and reputation. As the largest comprehensive design and arts college in the U.S., we must center and support student learning, academics and research that are aligned with the larger cultural and creative sectors.

“In the next three years, we are expanding our regional growth — adding a learning space and creative microretail in downtown Phoenix; co-designing a film, immersive media and innovation center with the city of Mesa; and building direct programming in Los Angeles with the acquisition of the Herald-Examiner Building.”



## Bored in quarantine? Taking up a new hobby is healthier than Netflix

Advancements in technology and the ubiquity of streaming services have allowed for the proliferation of binge-watching culture. Chris Wharton, assistant dean of innovation and strategic initiatives at ASU’s College of Health Solutions, wanted to know what kind of relationship the time we spend in front of screens has with health behaviors and factors. In a recently published study, he found that heavy users of screens — defined as those who use screens an average of 17.5 hours per day — reported the least healthful dietary patterns and the poorest health-related characteristics. Heavy users of smartphones reported the lowest quality of sleep. “We have some qualitative data to suggest that when people eliminate screens from their lives at night, magical things happen,” he says.

## New residence hall on Polytechnic campus offers academic space and home to honors college

Lantana Hall, a four-story, state-of-the-art facility, located on the north side of campus near Century Hall, provides 374 beds for the Polytechnic campus’ growing student population. It also has approximately 8,500 square feet of academic space on the first floor, including two classrooms, multiple offices, conference rooms and lounge spaces conducive to a “live-learn” experience.

“It’s indicative of the success of the Polytechnic campus, the Polytechnic spirit, our relationship with the city of Mesa, the building of a university campus in Mesa, our connection between the Poly campus and downtown Mesa — all these things,” ASU President Michael M. Crow says. “We’re very excited about both the Polytechnic campus and Lantana Hall getting off the ground.”

The Polytechnic campus gives students access to seven ASU colleges and schools, including Barrett, The Honors College. Lantana Hall will serve as a home for the Barrett community’s first-year to fourth-year students. The Barrett suite will also provide a place where honors students can collaborate.





## ASU ranked a top 10 university for technology company hires

ASU ranked No. 6 out of 10 public and private universities in the U.S. in technology sector hires in a recent survey by the talent company SHL with 8,320 graduates now working at some of the largest tech companies across the country, including Amazon and Apple. ASU outranked Carnegie Mellon University; Georgia Institute of Technology; University of California, Los Angeles; and the University of Illinois, Urbana-Champaign.

ASU ranked No. 3 on Amazon's list, employing 1,711 graduates, and besting the University of California, Berkeley. As for Apple, the SHL survey ranked ASU No. 6, employing 813 ASU graduates.

"It's a testament to ASU's commitment to excellence to see our talented graduates thriving and impacting a highly competitive industry," says Mark Searle, executive vice president and university provost.



## Chimpanzee 'bros' hang out as friends, but most social ties remain a mystery

Strong social ties are a key driver of cooperation in many species and are associated with adaptive benefits in several of them, including humans, feral horses and dolphins. Although such bonds are widely observed, it is not always known why any two particular animals become friends (just as in humans).

In a recently published article, ASU primatology graduate student Joel Bray and ASU primatologist Ian Gilby used long-term observational studies of chimpanzees at Gombe National Park in Tanzania to analyze what factors explain partner choice and cooperation in male chimpanzees.

They found that male chimpanzees formed friendships lasting up to 13 years. Maternal brothers formed the strongest bonds, but overall, only a small number of close bonds among adult male chimpanzees were explained by kinship. Beyond kinship, there was no clear predictor of which males formed friendships. For example, males of similar age and rank were also not more likely to associate, which suggests that bond strength results from a more complex process than a simple accounting of basic characteristics.

**"Winning the Swarthout Award was one of my first big artistic triumphs, and I still remember the joy I felt when I heard my name announced. That moment gave me the confidence to believe that my work could have meaning in the wider world, which is a gift I'm still grateful for."**

— ADRIENNE CELT, WHOSE LATEST NOVEL, ["INVITATION TO A BONFIRE,"](#) WAS NAMED ONE OF THE BEST BOOKS OF THE SUMMER IN 2018 BY ELLE, PARADE, HARPER'S BAZAAR AND O MAGAZINE



ASU's Glendon and Kathryn Swarthout Awards in Writing have supported talented ASU students like Celt with prizes for poetry and fiction for 58 years. During Campaign ASU 2020, the family added to its endowment to expand the awards from eight to 16 individuals annually.

## A labor of love and beetles

When entomologists Charles and Lois O'Brien donated 1.2 million weevils, a type of beetle, to ASU in 2017, every insect in the collection had to be carefully unpinned and repinned according to ASU's classification system. ASU scientists who lovingly and gingerly took on the task are about two-thirds of the way to a complete reorganization of the collection, valued at more than \$12 million. According to Nico Franz, curator of [ASU's Frank Hasbrouck Insect Collection](#), they have published 15,000 digitized weevil and planthopper specimens, including high-resolution images of nearly 750 uniquely valuable "type specimens," into ASU's web data portal, allowing other researchers access.





Associate Professor Joe Burgstaller, center, leads his students during the trumpet studio group lesson outdoors. Players use instrument bell covers as they play and space 18 feet apart.

#### THE GREAT OUTDOORS

### Outdoor music classes a high note for ASU students, faculty alike

ASU is in that golden time of year when months of excellent weather stretch ahead. And with the risk of coronavirus transmission lower outdoors than inside, some professors are finding ASU's beautiful outdoor spaces a great option.

"All my colleagues at other institutions are going inside or going home," says Associate Professor Brian DeMaris, who has held his opera repertoire class outside the Music Building.

To make it easier for more of the community to enjoy its outdoor spaces, the university added four new "outdoor rooms" — shade structures with seating, power, lighting and Wi-Fi ; 272 tables; 1,088 chairs; and 113 benches across its four Valley campuses.



## Music Plaza redeveloped for performance and outdoor learning

The Nelson Fine Arts Center Music Plaza now features enhanced pedestrian circulation and accessible routes throughout the site, opening up to new landscaping and seating for community enjoyment. The addition of a large shade structure, which was repurposed from Orange Mall, has special lighting for student use and special presentations and the creation of two outdoor stages provides an opportunity for live performance.



## Now Open—Schedule Your Tour Today!



Mirabella at ASU is the nation's most exciting new community for older adults! Located right on the Arizona State University Tempe campus, our integration with ASU means an experience like no other, with access to classes, lectures, performances, sporting events and so much more. Along with luxurious high-rise residences, resort-like living and a continuum of on-site healthcare services, Mirabella at ASU is a revolution in retirement!

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**M** MIRABELLA

**ASU**

Mirabella at ASU is a nonprofit, resident-centered community developed in partnership with Pacific Retirement Services and Arizona State University. Equal housing opportunity.

# Advance your career

What is risk innovation?

Digital portfolio tools

How can we employ MULTIMODAL THINKING with our challenges?



Reimagine health

REVERSE ASSUMPTIONS

How can create sp

IT'S A PRACTICE

## Innovative skill building designed to educate, engage and inspire

This winter, Sun Devil students, alumni, families and members of the community tapped into the sizzling energy of the most innovative university in the nation. Introducing Innovation Week and Innovation Quarter, ASU offered an opportunity for everyone to experience the university's collaborative, inclusive mindset firsthand throughout five transformative weeks of free virtual programming. Ushering in a new year of innovation, learners of all ages delved into a catalog of nearly 200 activities designed to spark new ideas, cultivate connections, develop skills to address societal challenges and demonstrate how a single idea can catalyze game-changing impact.

Build your skills with innovation modules at [asuforyou.asu.edu/innovators](https://asuforyou.asu.edu/innovators).

## 5 questions with Kara Goldin

Hint's CEO shares hard-won advice.

18

## Your best year ever

May Busch provides 4 tips for accelerating your career.

20

# 5 questions

## with Hint Inc. CEO Kara Goldin

**Kara Goldin, '89 BA in communication, is the founder and CEO of Hint Inc., a flavored water brand founded in 2005. The company has expanded into other markets with an oxybenzone and paraben-free sunscreen, and a plant-based, aluminum-free deodorant. Goldin has donated to scholarships at ASU and volunteered to help mentor student entrepreneurs.**

### Alum and beverage entrepreneur shares leadership tips

Kara Goldin started her company, Hint Inc. to help her family and other people drink more water and get healthier, and her business now employs nearly 250 people. Here she provides her hard-won advice for starting a business, raising capital, managing people and sticking to your values.

#### 1 What is your advice for people thinking about starting a business?

**Goldin:** I created Hint to solve a need that I discovered in myself. After having three kids fairly close together (and I now have four), I had gained a lot of weight and lacked energy. After trying diets and exercise and seeing several doctors, I realized that my problem was the diet soda I had been drinking all day for many years. I tried switching to water and, after a few weeks, I had lost a lot of weight and was starting to feel better, but I found water so boring! After experimenting in the kitchen all summer, I decided to start Hint to help people fall in love with water. With fruit



essences, I was able to make water taste great without tasting sweet.

It helped me break my addiction to sweet drinks. So the need was personal, but it quickly transformed into something bigger: a mission. I knew nothing about producing a beverage for sale, but I did have a deep feeling I could develop something healthy and positive and that there was nothing else quite like it available.

I thought, "This might be the opportunity to make a difference in the world. I could help make people healthier and feel better."

#### 2 Hint's value system includes transparency and the desire to help people. Has it been challenging to keep this value system front and center as the company has grown?

**Goldin:** Once you get past 50 people in a company, it is very difficult for everyone to do what they're supposed to do without much supervision. By that point you've moved well past the stage where it feels like one big family and you better have a few good people in place to manage the team. That's also the point where the mission is at the most risk if you haven't laid it out clearly. I try to share stories with the team that

illustrate why we're on our mission and what's important to us.

The other thing that reinforces our value system is aligning the brand with a cause. In Hint's case, it's several causes: clean water, breast cancer awareness, Alzheimer's disease research, even ad-hoc stepping in to distribute water to firefighters during the California wildfires. Some of this work takes the form of fundraising, but what I've realized over time is that we can be contributing our knowledge and our time to champion these causes. That's where we're bringing that sense of mission front and center, when our employees can give of themselves and truly embody our values.

#### 3 What was your biggest challenge in making Hint successful?

**Goldin:** The hardest thing was getting an industry built around sugar and preservatives to help me bottle a fresh-tasting, unsweetened water infused with fruit flavor. I wanted to have a drink that most people would enjoy, that didn't taste sweet, that didn't contain preservatives but that had a decent shelf life. Basically that was impossible when I started Hint in 2005. My initial solution was to give up shelf life to find out if people liked it enough to buy it.



**“This might be the opportunity to make a difference in the world. I could help make people healthier and feel better.”**

—KARA GOLDIN

**4** Have you turned to mentors over the years?

**Goldin:** I've got people I can turn to for advice as things come up. One of my favorite things is hosting my podcast where I talk to entrepreneurs and business leaders. And through those relationships, I've learned many lessons about building a thriving business, managing through change, overcoming obstacles, and so on. It's a different kind of mentorship, but those connections have been incredibly inspiring and enriching to me.

**5** What advice would you give someone who is thinking of starting a business?

**Goldin:** Building a business can be fun, but when you're the boss you have a lot of weight on your shoulders and you need to recognize and be comfortable with the risks and responsibilities. Also, always be learning. ■



Listen to her podcast, “The Kara Goldin Show,” or purchase her book, “Undaunted: Overcoming Doubts and Doubters,” at [karagoldin.com/undaunted](http://karagoldin.com/undaunted)

# Your best year ever

## 4 ways to get your career off to a great start this year



### May Busch

The former COO of Morgan Stanley Europe is now an executive coach, speaker, advisor, author and executive in residence in ASU's Office of the President. Find her at [maybusch.com/asuthrive](https://maybusch.com/asuthrive).

How has the new year started out for you? Whether you're off to a roaring start, feeling underwhelmed, or something in between, this is a natural time to do some thinking and planning for the year ahead. And as my father says, "Chance favors the prepared mind."

Here are four things you can do to get your career off to a great start.

### 1. Choose your theme for the year

This can be an overarching theme that will guide you through the year. For example, it could be "the year of the promotion" or "the year of getting your degree." Or you can choose a set of words or phrases that really embody the intention you want to live out, such as "let's make everything simple, easy and fun this year."

In my case, I'm going to choose growth as my theme, both as it applies to my business and to my personal development. How about you? What possible themes are you considering? As someone who's attracted to taking on "shiny new opportunities," this will be a challenge, but I know it will guide me in the right direction, and I can't wait to tackle it.



## Set yourself up for your best year ever

In summary, to get your career off to a great start this year:

1. Pick your theme for the year.
2. Identify your three big wins.
3. Decide what investment you're going to make in yourself.
4. Sign up for the online summit at [careermasterykickstart.com/asu](https://careermasterykickstart.com/asu).

### 2. Identify the three big wins you want this year

Predetermine and preselect three big wins that you want to have this year. For example, they could be landing two new clients, passing an exam (e.g., the CFA or CPA exams) and getting over your fear of speaking up in meetings. So, think about what your three big wins could be. It's a more energizing way of asking yourself, "What are my main goals for the year?"

### 3. Decide what investment you're going to make in yourself

Think about which exact things you're going to spend your time, energy, mindspace and money on this year to build your foundation and make you even better in new dimensions.

For me, I'm going to reinvest in the mastermind groups that I'm part of, because I now realize how foundational they are to my current and future success. What are your investments going to be?

### 4. Join an online summit

There's a special fourth item that will be available soon to help you get your career off to a great start. It's my annual online Career Mastery™ Kickstart Virtual Summit, featuring 25 incredible experts from around the world sharing their latest insights and advice on how to be more successful in your career.

This is all about you and your career, so I can't wait to share it with you. ■

# Supporting our community



ASU for You is an ever-growing collection of tools and resources — many of them provided at no cost — that can help you adjust to digital teaching and learning, advance your career and more.



[ASUforYou.asu.edu](https://ASUforYou.asu.edu)

### No-cost training for teachers

The Arizona Virtual Teacher Institute offers training for teachers adapting to digital and blended learning environments.

Free Online

### Remote learning help

ASU Prep Digital offers help to students and families making the transition to remote learning.

Online



### Find and get the right job

Explore resources curated to help you begin your job search, perfect your resume and nail the interview.

Free Online

# Thank YOU ASU donors!

Because of **you** the future is **full of promise.**

See how you impact ASU and the community around us in this issue of ASU Thrive.

**ASU Foundation**  
Arizona State University





# Review

## DATA POINTS

### Mapping to reveal invisible complexity

In a joint collaboration between ASU Art Museum and the Los Angeles County Museum of Art, “Point Cloud (ASU)” is a newly commissioned light sculpture by Leo Villareal. He was inspired by the museum’s architecture, designed by Antoine Predock in 1987. Predock has described the experience of walking through the building, “The building defines a journey, a procession; it defines options and potentials rather than particular paths. It is an open matrix of possibilities for engagement.” Inspired by this phenomenon, Villareal mapped both the inside and outside of the building, creating more than 200,000,000 data points, then using the data points with his custom software to create this public artwork. He says his interest is in bringing the building to life through the use of light, revealing the unseen, and creating a sense of wonder. There are moments when the image is recognizable, but often viewers are taken on a journey that dissolves into abstraction.



“Point Cloud (ASU)” is part of the ASU Art Museum’s Halle Public Art Initiative and is generously supported by The Diane and Bruce Halle Foundation with additional funding from the Herberger Institute Dean’s Creativity Council and organized in collaboration with the ASU-Roden Crater Initiative. It was produced as a collaboration between the ASU Art Museum and the Los Angeles County Museum of Art.

**Year in review**  
Successes and triumphs from 2020.  
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Research, academic and impact achievements.  
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# Year in review

## In the news

# 20

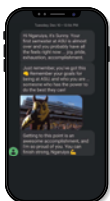
### January

#### A chatbot named Sunny is always there for students

With ASU ranked a top 10 university in the U.S. for first-year experience, we have the interactive chatbot Sunny

to be thankful for, in addition to the many programs welcoming new Sun Devils to campus. Sunny is there 24/7 to

answer students' questions about ASU, and when the bot is stumped by a question, a human is always available to respond to campus-related queries.



### February

#### ASU Innovation Open winners tackle large-scale industrial problems

Teams of entrepreneurs in the ASU Innovation Open win a total of \$300,000 in funding, the most ever. The entrepreneurship event drew more than 100 applications from student-led companies. Finalists, including three from ASU, represented 22 universities.



### January

#### ASU at Mesa City Center breaks ground

ASU at Mesa City Center is a state-of-the-art project designed to jump-start the revitalization of downtown Mesa and train students in one of the biggest industries in the U.S.: media production. The three-story academic building, scheduled to open in spring 2022, will offer programs in the Herberger Institute for Design and the Arts in digital and sensory technology, experiential design, gaming, media arts, film production, and entrepreneurial development and support.

### March

#### Sharing resources so learning continues at home

A vast collection of online resources is made available on a single platform called ASU for You, as people stay at home during the COVID-19 pandemic. It offers a wide array of content, much of it at no cost, for all learners — from elementary school students to adults — as well as resources for teachers and parents.



#### ASU brings new residence hall to downtown Phoenix

A 16-floor, 283,000-square-foot downtown Phoenix residence hall with a focus on entrepreneurship and the arts is scheduled to open in fall 2021 at the southwest corner of Fillmore Street and First Avenue.

# 20

April



## ASU, Crash Course partner for series of educational YouTube videos

ASU expands access to its academic content to a vast new audience through a new partnership with Crash Course, a YouTube channel of educational videos with 10 million subscribers.

ASU ranks as top in the U.S. and fifth in the world out of 766 institutions, achieving 96.3 out of 100 points toward the U.N. sustainability goals.

## ASU receives \$2M to boost coronavirus rapid research response

Emergency grants from the Virginia G. Piper Charitable Trust vastly increase efforts underway to coordinate preparedness responses to the coronavirus pandemic.

ASU ramps up a massive initiative to design, produce and distribute critically needed personal protective equipment and other medical supplies, launching the PPE Response Network. It links ASU and community resources to help health care providers and patients.

May

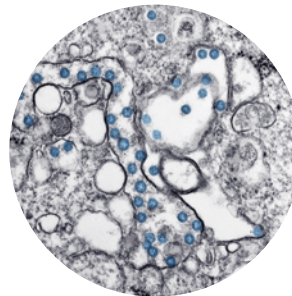
## ASU's Biodesign Institute develops state's first saliva-based COVID-19 test

To make COVID-19 diagnostic testing easier and more readily available, ASU researchers develop the state's first saliva-based test, providing rapid results in 48 hours or less. The tests detect an active COVID-19 infection by measuring the amount of virus present in the body. The tests diagnose an active COVID-19 infection by detecting genetic material from the virus. This kind of test, known as a PCR test, is the most accurate type currently available.



**“We realized as a university, we were uniquely capable of setting up this sort of [COVID testing] operation, because we had the skill sets, we had the technology ... We know how to do this, let’s do it.”**

— JOSHUA LABAER, BIODESIGN INSTITUTE EXECUTIVE DIRECTOR, ON WHY ASU IS THE OPTIMAL TESTING SITE FOR COVID-19



## ASU scientific team finds new, unique mutation in coronavirus study

As the coronavirus pandemic sweeps across the U.S., ASU School of Life Sciences Assistant Professor Efreim Lim leads a team that looks at how the virus may be spreading, mutating and adapting over time. Lim's team uses a new technology at ASU's Genomics Facility to rapidly read through the SARS-CoV-2 genetic code.

## Zoom partners with ASU on new research center

Zoom Video Communications Inc. announces the opening of a new research and development center near ASU. The company plans to hire software engineers over the next five years, drawing largely on ASU's engineering talent pipeline. “With 4,500 engineering graduates per year and a nationally competitive faculty ... we are making great strides in creating a top-tier, concentrated environment of technology and talent in greater Phoenix to support the workforce and research and development needs of companies like Zoom,” says ASU President Michael M. Crow.

**ASU Gammage launches digital series**

The Digital Connections programs include live performances, master classes by renowned artists, demos and other experiences online.



Led by composer Daniel Bernard Roumain, The DBR Lab artists create music, spoken word, movement and film, now adapted into livestream and recorded presentations.

**An uncommon commencement**

ASU celebrates virtual commencement with nearly 16,400 graduates — projected to be the largest class yet — including approximately 4,200 ASU Online students. Nearly 6,600 graduate with honors, the most ever for an individual class.

**June**

ASU research and innovation leader Sethuraman Panchanathan is confirmed as director of the National Science Foundation.



**July**

**Partnership to increase COVID-19 diagnostic testing in Arizona**

The Arizona Department of Health Services and ASU create a new partnership to expand COVID-19 diagnostic testing in Arizona. ASU sets forth plans to launch several testing sites to provide free saliva testing in high-need, underserved communities around the state. Through this partnership, ADHS has committed up to \$12.7 million to fund the expansion of testing sites to serve up to 100,000 Arizonans.

**New Mars rover is carrying an ASU camera system**

The ASU-led mast-mounted camera system for NASA's Mars 2020 rover mission, Mastcam-Z, achieves a major milestone when the cameras are officially installed on the rover's mast. Mastcam-Z is a dual camera system that can zoom in (hence the "Z"), focus and take 3D pictures and panoramas at a variety of scales.

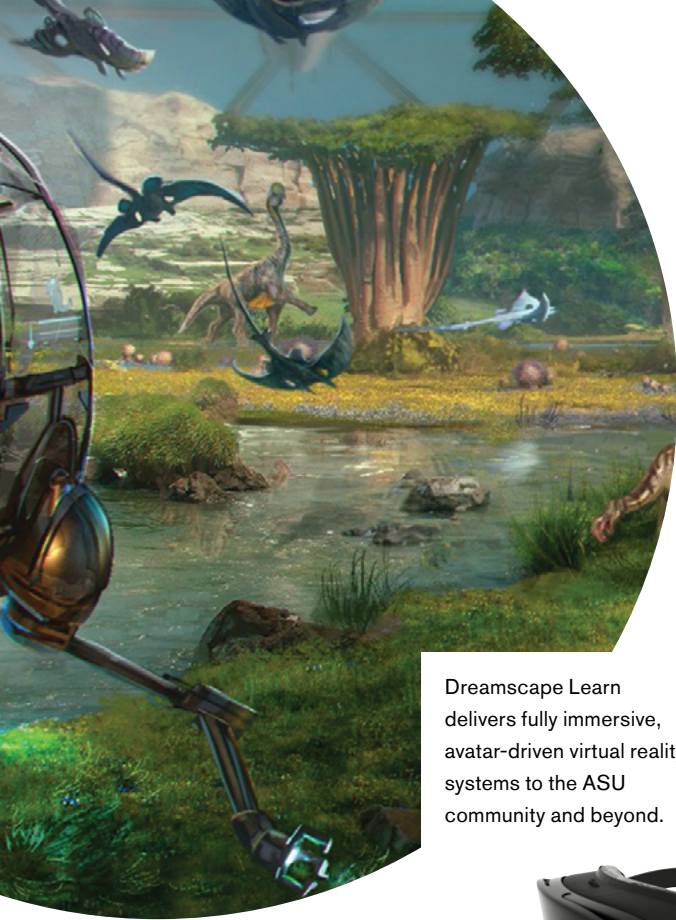


**August**

**Launch of virtual institute to prepare teachers for online instruction**

The new \$7.5 million partnership among the governor's office, the Arizona Department of Education and Helios Education Foundation, ASU Prep Digital's Arizona Virtual Teacher Institute supports the state's K-12 teachers delivering instruction in online and blended learning environments.





Dreamscape Learn delivers fully immersive, avatar-driven virtual reality systems to the ASU community and beyond.



### September

#### **Infosys, ASU partnership will accelerate workforce development in Arizona**

Infosys, a consulting company that creates digital platforms, opens its new Technology and Innovation Center in the SkySong ASU Scottsdale Innovation Center, creating its sixth U.S. hub and accelerating workforce development in Arizona as it is on track to create 1,000 jobs.

—

ASU is named the most innovative university in the nation for the sixth year in a row, and one of the top 50 public schools in the country by U.S. News & World Report.

Dreamscape Immersive, the world's leading virtual reality company, and ASU launch a bold partnership to bring cutting-edge virtual reality to learners worldwide.

—

#### **ASU launches Julie Ann Wrigley Global Futures Laboratory to transform the world for a better future**

In response to current crises and driven by the belief in making positive, substantive advances, ASU announces the launch of a laboratory dedicated to keeping our planet habitable and enhancing the options for future generations to thrive.

### **“In focusing on the immediate issues and opportunities for Black faculty, staff and students, ASU earnestly accepts the inclusive institutional responsibilities laid bare in the ASU charter.”**

— MICHAEL M. CROW, PRESIDENT OF ASU, WHO PRESENTED A LIST OF 25 ACTIONS TO SUPPORT BLACK STUDENTS, FACULTY AND STAFF

### October

#### **T-Mobile partnership employs smart technology on Tempe campus**

The ASU and T-Mobile partnership launches a new Internet of Things pilot project connecting smart technology sensors to the blue light poles on campus in an effort to use existing infrastructure to improve safety; monitor area capacity including pedestrian and automobile traffic; and more. Three poles on the Tempe campus will be equipped with sensors in early 2021. The partnership aims to understand how trends like 5G and IoT can be used from campus to community to improve connectivity for millions of Arizona residents.

### November

#### **NASA selects ASU teams for astrobiology research**

NASA selects eight new interdisciplinary research teams to inaugurate its Interdisciplinary Consortia for Astrobiology Research program working across astrobiology research, cosmic origins and planetary system formation to the origins and evolution of life and the search for life beyond Earth.

—

Sun Devil 100 Class of 2020 has combined revenues of \$6.1 billion. The 127 Sun Devil alumni honored have earned 155 degrees, across every college, and they employ more than 10,200 people in 10 states.

### December

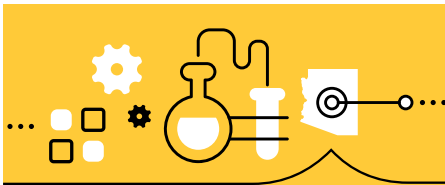
#### **ASU awarded \$12.5M to better understand COVID-19 immune response and improve patient outcomes**

With funding from the National Cancer Institute, ASU will join the NCI Serological Sciences Network, the nation's largest coordinated effort to study people's immune response to COVID-19. The goal is to develop high-performance serological tests to determine previous exposure to SARS-CoV-2.

# Year in review

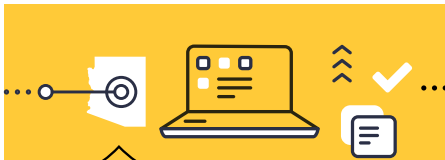
By the numbers

## Economic impact



**\$886.5M**

in research-based economic impact on Arizona economy



**\$292.6M**

2-year economic impact on Arizona from ASU startups and affiliated businesses in 2019 and 2020



**\$17.2B**

Annual earnings by Sun Devil alumni working in Arizona

— L. WILLIAM SEIDMAN RESEARCH INSTITUTE

## Research



**150+**  
startups

One of the top-performing U.S. universities for inventions and licensing deals, ASU has been the launching pad for 150+ startups

— SKYSONG INNOVATIONS

**Top 10 in the U.S. for patents: ASU with Stanford, MIT and Harvard**

— U.S. NATIONAL ACADEMY OF INVENTORS AND THE INTELLECTUAL PROPERTY OWNERS ASSOCIATION



**With an estimated \$660M total research expenditures**

**in FY20, ASU is one of the fastest-growing research enterprises**

**in the U.S. —ASU KNOWLEDGE ENTERPRISE**



## Academics

### #1 most innovative in the U.S. for six consecutive years, ahead of MIT and Stanford

—U.S. NEWS & WORLD REPORT, SIX YEARS, 2016-2021

## 30 programs in top 10 in the U.S.

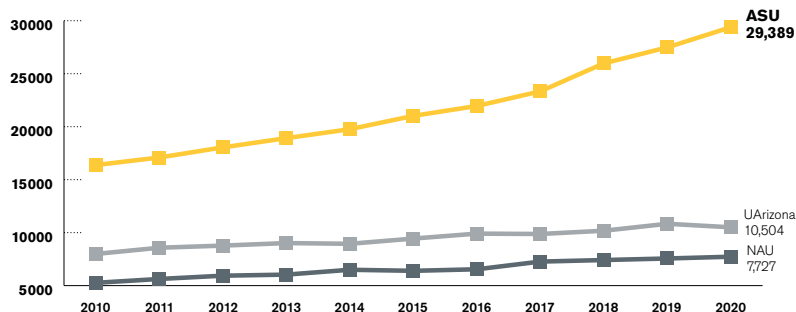
along with 79 ASU degree programs in the top 25

— U.S. NEWS & WORLD REPORT, 2021

### Top 10 nationally for best online bachelor's programs

— U.S. NEWS & WORLD REPORT, 2020

#### Degrees awarded



ASU annually graduates thousands of innovators who excel in engineering, business, education, the arts and other fields. In 2019-20, ASU awarded degrees to 20,308 undergraduate and 9,081 graduate students.

— ASU OFFICE OF INSTITUTIONAL ANALYSIS, UARIZONA UNIVERSITY ANALYTICS AND INSTITUTIONAL RESEARCH, NAU INSTITUTIONAL RESEARCH AND ANALYSIS

## Top producer of elite scholars for 10 consecutive years

For the past 10 years, ASU has been a top-producing university for elite scholars, including 262 Gilman Scholars, 192 Fulbright Scholars, 21 Goldwater Scholars, 14 Udall Scholars, 10 Gates Cambridge Scholars, 4 Marshall Scholars, 4 Truman Scholars, 2 Rhodes Scholars and 1 Churchill Scholar.

— FRANK OFFICE OF NATIONAL SCHOLARSHIPS ADVISEMENT, 2020

## Athletics

### Best in field

- Sun Devil Triathlon won its fourth straight national title. Kyla Roy won the individual national title.
- Wrestling, coached by alumnus Zeke Jones, won its 19th Pac-12 title.
- Baseball's Spencer Torkelson became the No. 1 pick in the Major League Baseball Draft as ASU had five selections, the most of any program.
- Brandon Aiyuk became the second straight NFL first-round pick, going to the San Francisco 49ers.
- Seven Sun Devils won Pac-12 individual titles: Brandon Courtney (wrestling), Tanner Hall (wrestling), Emma Nordin (women's swimming), Kordell Norfleet (wrestling), Zach Poti (men's swimming), Jacori Teemer (wrestling) and Anthony Valencia (wrestling).
- Samantha Noennig and Jackson Lewis make the Academic All-America® Division I track and field/cross country teams.
- Brinson Pasichnuk the first player to sign an NHL free agent contract.

## Philanthropy

# \$290 million

raised by the ASU Foundation in FY20 for students, faculty, research and community programs



# 90,357

unique donors to ASU in FY20

# 7,900+

ASU students received scholarships funded by donors last school year



**Statistician Sally C. Morton comes to ASU from Virginia Tech to lead ASU's Knowledge Enterprise, which supports an estimated \$660 million research enterprise on subjects ranging from space exploration to food systems.**



**Maria Anguiano will lead ASU's Learning Enterprise in a new position growing education options from K-12 to midcareer to post-retirement through scalable, technology enabled pathways.**





# Impact the community

## ENTERPRISE BUILT TO THRIVE

More than a decade ago, ASU set forth a new and ambitious trajectory to become a comprehensive knowledge enterprise dedicated to excellence, broad access to quality education and meaningful societal impact. All of its energy and creativity have been brought to bear on the design of a uniquely adaptive university committed to producing master learners. In order to achieve these goals, ASU now includes Academic, Knowledge and Learning Enterprises. Nancy Gonzales '84 BS in psychology and biology, will become the next executive vice president and university provost, responsible for the Academic Enterprise of ASU. She will engage in all aspects of the day-to-day operations of the university as well as develop and support long-term strategic initiatives driving student and faculty success and advancing academic excellence.

**Nancy Gonzales is currently professor of psychology and dean of natural sciences in The College of Liberal Arts and Sciences. Her research examines culturally informed models of family and youth resilience in low-income communities.**

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# Entrepreneurs making a difference

Private donations and corporate partnerships help make it possible for local startups to succeed

Story by CRAIG GUILLOT

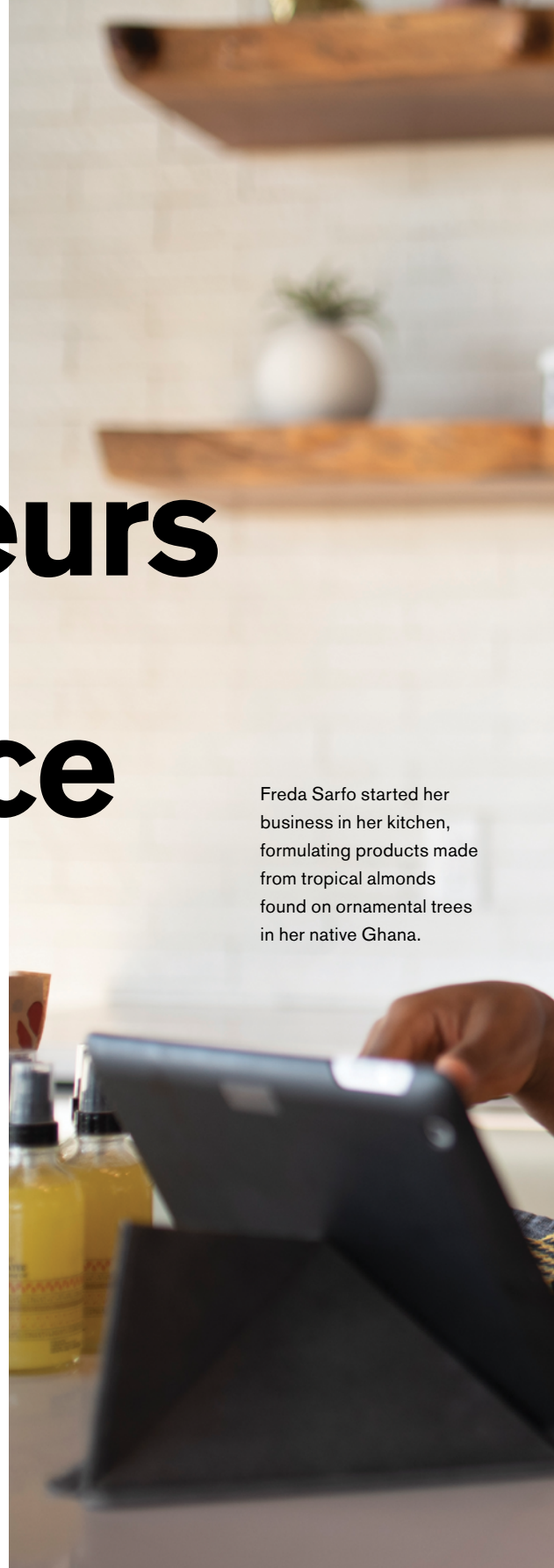
It's one thing to create a good idea, but it's a challenge to turn that idea into a profitable and sustainable product or service. Having access to mentoring, education and financial support greatly increases the odds of success.

Community members and ASU alumni, students and faculty can take advantage of several entrepreneurial resources through the J. Orin Edson

Entrepreneurship + Innovation Institute, from workshops to mentoring to funding. Much of the funding is awarded through biannual Demo Day competitions where ventures deliver pitches as they compete for hundreds of thousands of dollars.

To date, more than 600 entrepreneur teams are impacting the world with the support and financial backing of ASU and philanthropists. Here are just a few powerful examples.

Freda Sarfo started her business in her kitchen, formulating products made from tropical almonds found on ornamental trees in her native Ghana.





## **Freda Sarfo**

### **A fruit offers opportunity in Ghana**

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While tropical almonds (known locally as Abrofo Nkate) have long been consumed as a local sweet in Ghana, they haven't always been viewed as a source of economic prosperity. After learning from a horticultural engineer about the promising, yet undervalued benefits of the tree, Ghana-born Freda Sarfo dug deeper. She learned the fruits have a high-quality cosmetic oil, more protein than chicken and more fiber than oats.

"We started doing more research into the nutritional composition of the tropical almond, how it benefits the body," Sarfo says. "And there weren't any products on the market with it."

Sarfo, a master's degree student in global logistics and a Mastercard Foundation Scholar, applied for the Venture Devils and won \$4,000 in 2019. She says that her study of supply chain and logistics has helped her in establishing Tropical Almond.

"In our business strategy, because there are no established tropical almond farms, we source from tropical almond trees in communities and homes from different regions across Ghana. Without these trees, our business wouldn't be. My knowledge and experience from ASU has helped me to design and manage our

diverse supply chain effectively and efficiently. I occasionally went to Dr. Dale Rogers with questions on Tropical Almond's supply chain, and he was always happy to assist with his advice and suggestions."

In establishing [Tropical Almond](#), she used the funds to travel back to Ghana, educate people on the trees' benefits and create a business plan. She built a small processing facility and pays women to collect and crack the fallen nuts then cold press them to retrieve the oil. The company also makes high-protein snacks using the almonds. Tropical Almond currently works with about 60 women, mostly single mothers. It has significantly helped during the pandemic as many of these women lost other odd jobs.



Through outreach, the Tropical Almond team also has saved more than 100 trees that would have been cut down. In addition, for every bottle of almond oil sold at the online store, the company donates a bag of high-protein snacks to hungry children.

"Our tactic was to help these mothers find social income, reliable income so they can take care of their children and families," Sarfo says.

Mayank Mishra and Shruti Gurudanti at a livestream event for their company that helps reduce senior isolation.



### **Shruti Gurudanti and Mayank Mishra Addressing Loneliness among seniors**

Even before the pandemic, loneliness was a growing problem among seniors. It has worsened, with more than half of adults ages 50 to 80 reporting feeling isolated, according to a June 2020 University of Michigan National Poll on Healthy Aging.

Years ago after witnessing a loved one's struggle, Shruti Gurudanti sought ways to address social isolation. In 2018, she co-founded [televēda](#) with Mayank Mishra. Soon after, at a community networking event, Mishra met

Kristin Slice, the senior program manager for Peoria Forward, an Edson E+I Institute program in partnership with the city of Peoria for community members. The support helped the co-founders further develop televēda, which acts like a virtual senior community center and addresses senior isolation using easy-to-use technology, including live interactive classes and games, as well as streaming events. Participants can see the instructor, talk to other participants and compete. Examples include multiplayer bingo, interactive fitness classes, live music from the Chandler Symphony Orchestra and other musicians, and tailored interactive education classes. All of this helps older adults build and



### Services for vulnerable populations

Televēda has received requests from organizations that serve adults and children with special needs, so the company has opened up many classes to homebound seniors and others for free. Learn more at [televēda.com/televēda-corona-response](https://televēda.com/televēda-corona-response)

**“Our goal is to be a widespread virtual recreation center to reduce social isolation, and so people don’t have to worry about feeling lonely again.”**

— SHRUTI GURUDANTI,  
CO-FOUNDER OF TELEVEDA

maintain friendships and feel more engaged and satisfied with life.

Since its founding, televēda has created virtual senior communities that have helped more than 1,500 users, including seniors in nursing homes, assisted living facilities and their homes.

Recently, Gurudanti heard from a widower who uses the platform to socialize. “He keeps coming back to these classes. What’s beautiful is that he doesn’t feel like he’s coming to a support group. For me, that’s a success,” Gurudanti says.

In May 2020, at the Greater Phoenix Tech Challenge, the company won a \$50,000 grant from the Pakis Center for Business Philanthropy at the Arizona Community Foundation. Televēda will use the funds to expand from its current seven employees.

“Our goal is to be a widespread virtual recreation center to reduce social isolation, and so people don’t have to worry about feeling lonely again,” Gurudanti says.

## Demo Days

**Thank YOU** The donors who help make each Demo Day possible understand that funding, education and mentorship are vital to entrepreneurs. Among the funders is the late J. Orin Edson, a successful entrepreneur who built Bayliner Marine Corp. Over the past 15 years, he supported the Edson Student Entrepreneur Initiative and left behind enough money to provide further support in perpetuity after he passed away in 2019.

### More than 300 student teams and 1,000 student entrepreneurs

Number of student entrepreneurs supported by the [Edson Student Entrepreneur Initiative](#)

# \$3M

Amount awarded to date at the biannual Demo Day competitions

# \$52M

Amount raised to date in external funding for ASU’s entrepreneurial programs

# \$312K

Amount awarded at the spring 2020 Demo Day; \$150K came from local entrepreneur Tom Prescott, whose recurring gifts fund the eSeed challenge

# \$292.6M

2-year economic impact on Arizona from ASU startups and affiliated businesses for the fiscal years 2019 and 2020

SOURCE: TOM REX, L. WILLIAM SEIDMAN RESEARCH INSTITUTE



## Get help with your innovative idea

Have a new product, service, process or business idea? Join a comprehensive ecosystem that includes support, funding sources, mentors, innovation spaces, academic courses and community programs that help all entrepreneurs thrive. This includes the new Venture Devils+ for winners of seed funding at a Demo Day competition, which provides the ability to apply for additional mentoring over the course of a semester. Check out these resources at [entrepreneurship.asu.edu](https://entrepreneurship.asu.edu).

Are you interested in supporting startups? Contact us to get involved at [entrepreneurship.asu.edu](https://entrepreneurship.asu.edu).

## Watch entrepreneurial Sun Devils

Learn more about the establishment of the J. Orin Edson Entrepreneurship + Innovation Institute and hear from startup founders from five ventures about their journeys: EqualComm, Phoenix Coqui, Pura Vida Grinds, Navi Concierge Nurses and NeoLight: [youtu.be/xlRnRt8KLlg](https://youtu.be/xlRnRt8KLlg).

## Dylan Lang Improving communication for people with hearing loss

Over the course of three years between high school and college, ASU computer science senior Dylan Lang lost nearly 90% of his hearing because of a condition called profound bilateral hearing loss. While learning to deal with his ailment, Lang developed an interest in computer science and artificial intelligence and applied that knowledge to developing a smartphone app to help people with hearing loss. In the app, which Lang expects to make public in a few years, the webcam views a person's hand motions, then AI converts that information to text. In reverse, a person speaks, then AI makes the hand motions on the screen.

"I've seen how the lack of resources impacts the deaf community," Lang says. "There's often a communication barrier, and [the deaf] have to communicate with notes or notepads. Interpreters aren't always around."

Lang, who is president of the Deaf Devils student organization, demonstrated the concept at the first Demo Day in 2018 and won \$35,000 to turn the idea into a company named [EqualComm](https://equalcomm.com). Lang is testing the machine learning output and credits the J. Orin Edson Entrepreneur + Innovation Institute and Brent Sebold, a lecturer and administrator of entrepreneurship and innovation programs, for helping him fine-tune the concept.

"I think the app can empower [deaf] individuals to bridge the communication gap when they are out in the community," Lang says.



Dylan Lang aims to improve communication for people with hearing loss; he is shown here against a green screen capturing movements for an avatar.

## Ryan Stoll

### Reducing anxiety in children

While working on his PhD in clinical psychology at ASU, Ryan Stoll discovered in one-on-one sessions he facilitated that many people struggle with similar anxiety issues. He thought that maybe there was a way to proactively help people using evidence-based tactics.

With years of research around anxiety at The Courage Lab at the ASU Department of Psychology, combined with assistance through ASU's entrepreneurial ecosystem, in 2017 Stoll came up with a six-lesson game-based anxiety prevention program for children called [Compass for Courage](#).

After going through the classes and mentorship offered by the J. Orin Edson Entrepreneurship + Innovation Institute at ASU's program Venture Devils and refining his idea, Stoll created and mastered a five-minute "Shark Tank"-like pitch for Demo Day, which landed Compass \$34,500 in funding in 2017 from the Changemaker Challenge and the Edson Student Entrepreneurship Initiative. "It enabled me to create a brand around the science, design the program and order the first 100 kits," Stoll says. "The funding and ability to use the ASU platform have opened new opportunities for the business."

The project received another \$30,000 the following year during Demo Day and has so far trained counselors in 55 Arizona schools and helps about 350 students each year. With ASU's help, Stoll has been able to conduct research which shows improvements in patients' emotional awareness and their ability to gain more confidence in stressful situations because of Compass for Courage. ■

**"The funding and ability to use the ASU platform have opened new opportunities for the business."**

— RYAN STOLL, FOUNDER OF  
COMPASS FOR COURAGE



Ryan Stoll delivering a five-minute pitch at a Demo Day competition.

# Campaign ASU 2020 **By the numbers**

# 353,650 donors

gave during Campaign ASU 2020;  
208,040 were first-time donors to ASU.

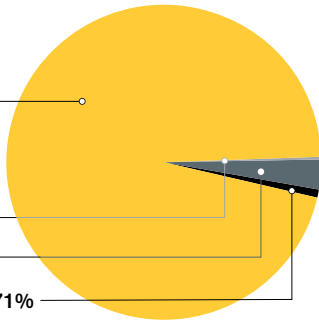
Where do gifts come from?

Alumni, faculty, staff, parents and community members **95.94%**

Foundations **0.41%**

Corporations **2.94%**

Other organizations **0.71%**



**\$860** average gift amount

31% growth in average gift size since the campaign began

6,132 gifts greater than \$25,000

Every contribution matters

# 89%

of all gifts are \$100 or less.

**CAMPAIGN ASU 2020**

Thank YOU

Student access and excellence

## \$253M distributed for scholarship and academic support

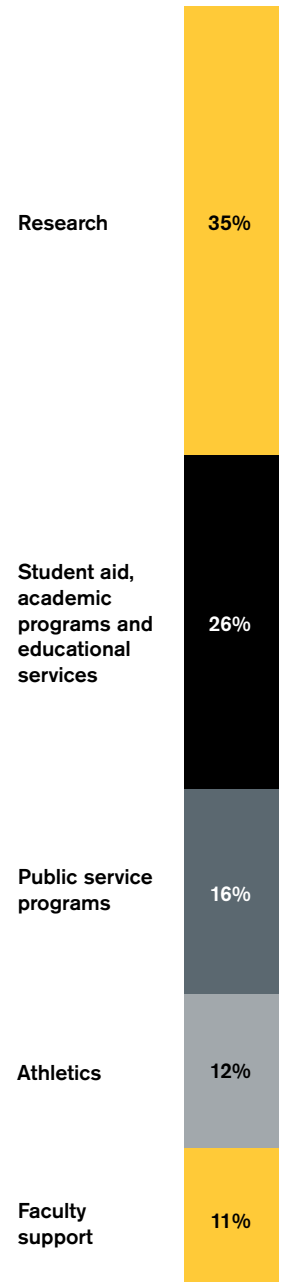
- 36% growth in scholarship dollars disbursed
- 70,969 undergraduate and graduate students who received ASU Foundation philanthropic scholarships
- 22% growth in scholarship recipients

Faculty excellence

## \$81.7M raised for chairs and professorships

- 143 chairs and professorships established across numerous colleges and departments, including nine new chairs in the W. P. Carey School of Business and eight new chairs in the Ira A. Fulton Schools of Engineering
- 40% increase in number of chairs and professorships since the campaign began

## \$2.3B total raised



Source: ASU Foundation





## Reason to celebrate

Campaign ASU 2020, a comprehensive fundraising campaign in which 353,650 supporters around the world raised more than \$2.3 billion for ASU students, faculty, research and community programs, is having an impact.

When ASU began the public phase of Campaign ASU 2020 in January 2017, it was an opportunity to share ASU's innovative model of higher education with a global audience. ASU had spent the previous decade redesigning and restructuring the American university. Its new paradigm was designed to be accessible, excellent and responsive to the needs of each individual student; to advance research and discovery of public value; and to assume fundamental responsibility for the communities it serves.

The campaign was an invitation to those who share that vision. It was an opportunity to build a broad-based partnership of supporters committed to scaling and building upon ASU's proven model of educational innovation.

Support came in gifts of all sizes and in many forms. In just two years, ASU surpassed its original goal of \$1.5 billion.

The campaign represents a new beginning for ASU. Thanks to a global community of supporters, ASU's students, faculty and staff can look to the future with optimism and even higher ambitions.

Learn more about how fundraising is impacting the ASU community at [asufoundation.org](https://asufoundation.org).

### Thank YOU

Dwayne Martin-Gomez graduated from Barrett, The Honors College, where he received a Bidstrup Undergraduate Fellowship to support his work on a research project aimed at diabetes prevention. He also received a Woodside Community Action Grant from Changemaker Central to fund a Latinx festival and sustainability program.

# Learning





Sharon and Randy Fortenberry, who will be among the first residents at Mirabella at ASU, are moving to campus for lifelong learning opportunities.

With new projects and programs, outreach and options, ASU has ways to grow in every phase of life

**Story by** JAMAAL ABDUL-ALIM  
**Photos by** JAROD OPPERMAN AND STEPHEN STINSON

When Kyle Ballard finishes his shift as a U.S. Navy linguist at Fort Gordon in Georgia, he goes home to log on to political science courses to move closer to his dream career in global security. Meanwhile, ShaunteL Redhouse, a 2017 graduate of Kirtland Central High School who hails from the Navajo Nation, spends time gaining experience with research methods that will help in her quest to become a dietitian. High schooler Drew Kolber takes calculus online with college students and classes at the Herberger Young Scholars Academy on ASU's West campus. And soon-to-be retirees Randy and Sharon Fortenberry plan to settle at Mirabella at ASU on the Tempe campus.

At first blush, you might not expect people with such varied life experiences to all be enrolled at the same university.

# through life

### Toward greater inclusion

ASU President Michael M. Crow describes the efforts to educate students from diverse walks of life as a key element of the school's charter. It is also a necessary paradigm shift which he says America's colleges and universities must move toward instead of systematically styling themselves as elite institutions.

"The institution will be measured based on its success through inclusion versus exclusion

— and the success of all the students that we include," Crow says. He describes the university as a new "prototype" for this shift in higher education. "And so what we have to get away from is the old model, the terrible model of this strict social hierarchy of class, of caste, of sect."

### Native success

Perhaps the best place to start ASU's story of inclusion is with ShaunteL Redhouse, who is part

of [ASU's Native Narratives & Graduate School Achievement Track](#). The roughly three-and-a-half year initiative provides undergraduates with research opportunities in preparation for graduate school. Studies have shown that undergrads involved in research are more likely to graduate and also more likely to pursue a master's degree or PhD.

For Redhouse, this research involves looking at possible disparities on reservations in Title IX, the federal law that prohibits discrimination in federally funded education programs and activities on the basis of sex. Redhouse is helping sports historian Victoria Jackson conduct the research.

"I'm a sports fan and she's a sports historian, so that's how we got paired up," Redhouse says. "This is helping me prepare for the research side of nutrition. But also because the research is involving my Native heritage, it helps me feel closer and more knowledgeable about what's going on on my own reservation."

Redhouse plans to finish her undergraduate studies by the winter of 2021. While college

**"It helps me feel closer and more knowledgeable about what's going on on my own reservation."**

— SHAUNTEL REDHOUSE



The Native Narratives & Graduate School Achievement Track is supported by a grant from the Andrew W. Mellon Foundation.



enrollment for American Indian and Alaska Natives is the lowest among all racial and ethnic groups in the United States — 24% versus a national average of 41% — Redhouse sees her college experience as a potential catalyst to turn those figures around and an inspiration to other Navajos as well as her younger siblings.

“It means a lot to me. I believe it will be beneficial for my community, too, because I know in my free time or during winter breaks I go back to visit my high school and give presentations about what college is like,” Redhouse says. “I think it will have a profound effect on my community because I plan to go back and help out.”

### A sailor’s story

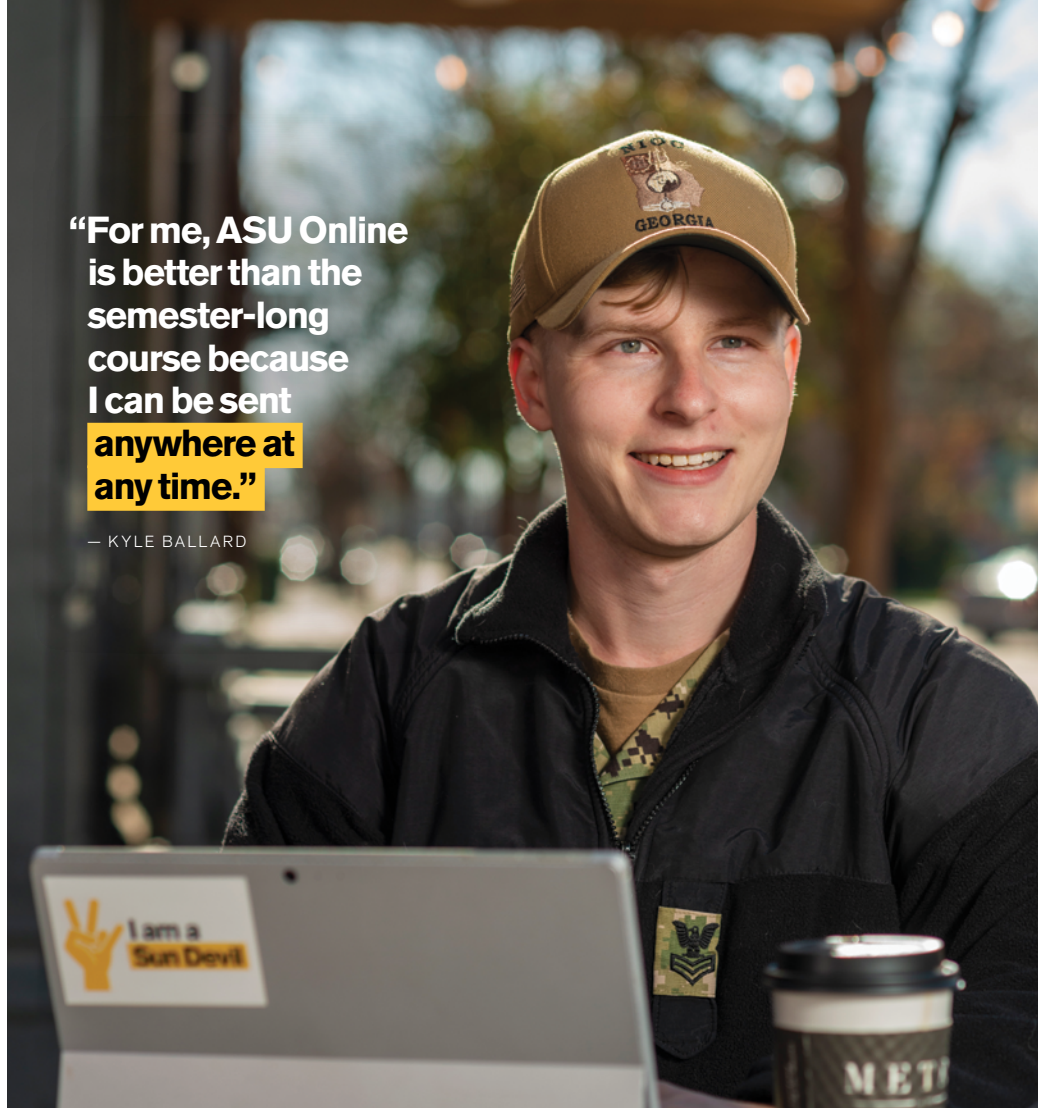
Kyle Ballard, the Navy linguist, knows he could be deployed at any time. That’s why, he says, the accelerated seven-and-a-half week courses he takes at ASU have so much appeal.

“So for me it’s been better than the traditional semester-long course because we can be sent anywhere at any time,” Ballard says. “These seven-and-a-half week courses, if that does happen, most likely I’m already done so I don’t have to worry about writing the university, sending them a copy of my orders and letting them know. So it decreases the odds that I’ll have to withdraw or do poorly in a course.”

Ballard is well aware that many of his military comrades end up going to for-profit schools that, too often, leave them with substandard degrees and a large amount of debt.

“For me, ASU Online is better than the semester-long course because I can be sent anywhere at any time.”

— KYLE BALLARD



“A for-profit doesn’t have the prestige,” Ballard says. “When I was looking for a university that I would apply to, I wanted to make sure they had a brick and mortar school and that their online program is run just the same. At ASU, they have the same material, same professors, same books. That was really important to me.”

It also helps that ASU offers many programs to help active duty personnel and veterans with college-related expenses.

### Early start

High school junior Drew Kolber, age 16, takes classes at the [Gary K. Herberger Young Scholars Academy](#) — a school for gifted

students in grades seven through 12 on the ASU West campus and largely funded by Jeanne Herberger and the late Gary K. Herberger. The unique school provides an advanced and accelerated curriculum differentiated specifically for gifted learners, and Kolber’s grateful for how it has stretched her.

“HYSA has been an immensely supportive environment where I am constantly asked to think differently and more deeply,” Kolber says. “I’m so grateful for the relationships I have with my teachers and administrators; they constantly challenge us to dive in and do our best work, while providing guidance every step of

Kyle Ballard is a U.S. Navy linguist based out of Georgia pursuing his degree through [ASU Online](#).

**“I’m really grateful for the way that my school has been this launch point.”**

— DREW KOLBER, 16, WHO TAKES CLASSES AT ASU WEST AS PART OF THE GARY K. HERBERGER YOUNG SCHOLARS ACADEMY

**Thank YOU** Herberger Young Scholars Academy was created in 2011 as part of ASU’s Mary Lou Fulton Teachers College with an endowment from philanthropists Gary and Jeanne Herberger.

the way on how to get to that final destination.”

Once Kolber completed all the math classes at the academy, with HYSA’s support, she enrolled in ASU’s MAT 270 course, also known as Calculus 1. She also takes Spanish 202.

In Calculus 1, Kolber interacts with students who range from fellow high schoolers to undergraduate to graduate students. She says she appreciates the opportunity

to experience the difficulty of college math and how to relate to professors.

“I’m really grateful for the way that my school [HYSA] has been this launch point within the greater ASU community and constantly been supportive and asked me to challenge myself, but has also been there too to help me explore those challenges, and to grant me as many opportunities as possible, and all my peers,” Kolber says. “That’s something that Herberger



does so well is provide a foundation and then ask us to go further.”

### Sunset years on campus

When Randy and Sharon Fortenberry, both longtime educators, move to the Tempe campus in February 2021, they hope it will be their last move. That’s because they’re moving into a high-rise retirement condo building called [Mirabella at ASU](#).

For many years, Sharon was the principal for the highest academic scoring elementary school in Washington state and for a school in Mexico. Over his career, Randy worked as a schoolteacher, administrator and counselor. For that reason, they say, Mirabella at ASU seems optimal.

“It’s an exciting time for us,” Randy Fortenberry says. “Unlike traditional retirement communities where the focus is often on managing aches and pains, we are looking forward to much more stimulating learning opportunities. Learning has always been a part of our lives, both our own continuous learning, and supporting the learning and growth of others.”

The Fortenberrys are planning to attend campus events at a student fee rate, take courses and enjoy the artists-in-residence who will perform at various Mirabella restaurants and lounges, and other benefits.

“I want to see what’s available, what’s offered, take it slower and then expand my coursework depending on what’s in the building,” Sharon says. “We would love to interact with students more. We loved the experience of having students



join our table at the luncheon last December. Getting to talk to students who are comfortable sharing and great at engaging with us was a real treat.”

Randy, a psychotherapist, recalls how he has done an “enormous amount of pro bono work” with veterans and students at the Austin Counseling Center in Austin, Texas, which he opened late in his career. He says he’s already in discussions with ASU about plans to help in similar ways. “I love working with college-aged kids, so I’ll have to stop myself from jumping into five different mentoring programs or taking so many classes that I don’t make time to work out and spend time [with Sharon],” Randy says. “I’ll need to be intentional about what we decide to commit to.” ■

**“Getting to talk to students who are comfortable sharing and great at engaging with us was a real treat.”**

— SHARON FORTENBERRY, WHO WITH HER HUSBAND, RANDY, WILL MAKE THEIR HOME ON THE TEMPE CAMPUS TO STAY ENGAGED IN THE ACADEMIC COMMUNITY

### Get involved

Find lifelong learning opportunities at [asuforyou.asu.edu](https://asuforyou.asu.edu)



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Emerson Meza wears the mask he made as part of the “Superheroes” series in which kids dressed up at home and engaged with teachers and other students online.

ENGAGING PRE-K KIDS

## Early emotional IQ

The stories of lifelong learners are but a small sampling of ASU offerings, including early childhood education, at the Child Study Lab. Established by the ASU Department of Psychology in 1972, the Child Study Lab is a preschool where children and families explore, create, learn and grow. Typically, classes are in-person where children begin to learn to manage their emotions. During the pandemic, the Child Study Lab provides a virtual model tailored for the littlest learners.

Visit the lab online for more information about the virtual program at [psychology.asu.edu/childstudylab](https://psychology.asu.edu/childstudylab).

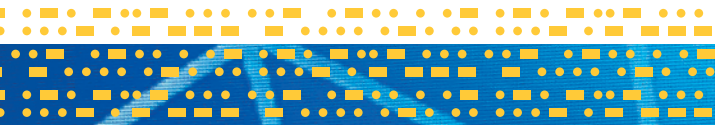
# Exploring new worlds

A man wearing a VR headset is shown in a virtual environment. He is looking upwards and to the right, with his right hand raised as if interacting with the virtual world. The background is a lush, green forest with a blue sky and a grid of light blue lines. In the bottom left corner, there are some large, pinkish-red fruits hanging from a tree.

Virtual reality: How students will learn biology in 2021 (and beyond)

Story by JENNIFER KITE-POWELL

Photography by JEFF NEWTON



**“When learners are immersed in a VR experience, they tend to get more out of the experience and are likely to have better outcomes.”**

— SCOTT LIKENS,  
PWC’S EMERGING  
TECH LEADER

**Alireza Bahremand, a graduate student working with the Dreamscape Learn team and Meteor Studio, explores the “Alien Zoo” module.**

## Imagine you're a biology

student studying hundreds of unknown species and microscopic life forms. Traditionally, you would walk into a classroom with four walls and a chalkboard to begin your learning journey. But instead, you step into a 16-by-16-square-foot space with moving floor and blowing wind. Once seated, you're transported light-years away to an orbiting intergalactic wildlife sanctuary full of endangered life forms that need your help.

Inside the pod, as your avatar, you're immersed in a new world. You're working in a virtual laboratory with a plethora of fictional animal species that function based on biological laws. You can explore, discover, observe and experience numerous hands-on problem-solving tasks that you can't dream of or do within a traditional classroom.

This isn't a game; it's ASU's new virtual reality immersive biology curriculum called Dreamscape Learn, made possible through a partnership with Dreamscape Immersive. Based on the work of curriculum experts at ASU, students in the university and beyond will benefit from the new world order of education: VR immersive learning.

VR learning can be much more powerful than lectures. A study from the University of Maryland showed that VR learning can improve recall by as much as 8.8% over traditional learning. A 2020 PwC report found that VR learners were four times faster to train than traditional classroom methods. But the bigger win is that learners were 3.75 times more emotionally

connected to the content than classroom learners.

### **Immersive video arcade meets IMAX theater**

In September 2020, something delightful was making its way to education. Seventy-five designers, coders and educators at ASU were collaborating to create the first immersive learning biology curricula on this planet as part of its new partnership with Dreamscape Immersive.

According to Heather Haseley and Dan Munnerley, co-executive directors of the Learning Futures Collaboratory, education needs to create VR learning experiences through gameful design — using the intrinsic and extrinsic motivators embedded in games.

And that is what ASU and Dreamscape Learn are doing, opening a portal through VR technology that transforms how students experience learning and shapes their learning pathways.

To transport students to this intergalactic wildlife refuge and preserve life that's extinct from across the galaxies, teams at ASU and Dreamscape Immersive turned a physical space in the campus's Creative Commons into an immersive learning creation and experience site featuring a multi-sensory VR experience for students. Step into the pod, put on a VR headset that's tethered to a computer backpack, strap sensors on your hands and experience the myriad of haptic sensations, bringing the experience to lifelike realness. Or for students outside of the immersive studio, they will still experience the

scientific journey into "Alien Zoo" in either 2D or 3D.

Buckle up, you're about to learn by doing, as you hurtle through space to a one-of-a-kind wildlife sanctuary far off in another galaxy.

### **Creating authentic and delightful learning experiences**

Learning by doing fell out of fashion, and except for the last few hundred years, almost everyone learned by doing, experiencing the world around them.

"This notion of immersive learning, emotional learning has been beaten out of the system, and now VR is the tool to reintroduce learning by doing into education," says ASU President Michael M. Crow.

"Alien Zoo" emerged from a script created by Walter Parkes and Steven Spielberg that didn't make it to the big screen. So what did these two legendary Hollywood producers do? They transformed it into an immersive experience available at shopping centers — and now are using it as a basis for learning.

Crow believes that delight has been missing from learning. "We haven't been able to attach to the emotionality of pleasure and delight in learning — particularly in these generic subjects like math, science and history."

In their 2020 "Virtual and Augmented Reality: Understanding the Race for the Next Computing Platform" report, Goldman Sachs identified nine use cases for VR and augmented reality that will drive market adoption; and education made the list with upwards of 15



The initial VR experience through Dreamscape Learn will be based on Dreamscape's first VR adventure, "Alien Zoo."

**“Technology has caught up with what people used to think about, and we can now build an emotionally driven learning experience to teach really complicated subjects.”**

— MICHAEL M. CROW,  
ASU PRESIDENT

million users by 2025, but so did content creation for VR.

“Storytellers can make anything come to life, but in science, you have to be accurate,” says Crow.

That’s where Michael Angilletta comes in.

Angilletta is an evolutionary biologist who leans more toward Bill Nye, the Science Guy, than a college professor. Angilletta is passionate about biology and the possibilities VR can bring to students. In 2017, he helped create ASU’s first digital biology courses and never imagined he would work with Hollywood storytellers to create a VR curriculum.

Now, Angilletta alongside Parkes and his team are collaboratively creating the science VR storyline and curriculum for the university’s first immersive biology class experience.

“The goal is for students to learn to think like biologists and solve problems, and VR is the hook to make this happen,” Angilletta



**Lauren Gold, a graduate student working on Dreamscape Learn, is also involved with another VR project involving Mars.**

says. “The biology curriculum will encourage them to master the same skills and the same knowledge to solve similar problems on Earth. We want to raise students’ critical thinking skills by immersing them in this world.”

Angilletta believes the only way to get students engaged in using critical thinking skills is to create exciting novel problems they can solve. “We have to provide learning goals and a pathway to achieve those goals, plus tell a good story,” he says. “My focus is to create

engaging, emotional storytelling and realistic biology.”

### **Back to learning by doing**

Angilletta says that developing the first of 12 modules of biology curriculum with the studio’s storytellers was a constant back and forth between what would make a cool story versus what’s grounded in science and engaging in VR.

“What makes virtual reality training so engrossing and effective is the immersive nature of the experience, which simulates a

classroom,” says PwC’s Scott Likens, emerging tech leader.

Likens adds that when learners are immersed in VR training, they are not distracted by outside influences such as texts and emails — common occurrences during online and classroom courses.

In addition to improved recall, the learning costs can be reduced by using VR. The PwC study found that VR training achieved cost parity with a classroom at 375 learners.

“At 3,000 learners, VR training became 52% more cost-effective than classroom training, and it achieved cost parity with online courses at 1,950 learners,” Likens says.

So what does a compelling, emotional story grounded in science look like in a VR curriculum in “Alien Zoo” on another planet?

“Imagine an animal eating another animal, and you have to do a ‘CSI’ thing and find out what ate it and how that affects the species,” Angilletta says. “Think about a population with a transmittable disease, like contagious cancers; they are rare on Earth, but they do exist, so as a biologist in this world, you’re concerned because you have to manage a population, not one individual, and that could affect the whole ecosystem.”

Angilletta says a student will walk away from ASU’s VR immersive learning with transferable skills like problem-solving, quantitative reasoning and collaboration.

“Sign up for 11 a.m. VR, go into the pod and off to your corner or meet up with other biologists [in the virtual world] to work together solving critical species survival problems,” he says.

Likens adds that VR’s simulations and immersive experiences also draw learners’ eyes to the content and better capture users’ attention.

“In the PwC study, VR-trained learners were up to four times more focused than people who took online learning and 1.5 times more focused than those trained in a classroom,” says Likens. “When learners are immersed in a VR experience, they tend to get more out of the experience and are likely to have better outcomes.”

#### Back to the future

“Imagine you’re in a classroom with a chair behind a desk that’s bolted to the floor. That ‘technology’ for how you sit in the room determines everything, it’s a fixed mode of learning,” Crow says.

But in the VR world, learners will shift from a passive approach to a more active approach of working through problems in groups.

Crow says ASU isn’t stopping with the VR curriculum for biology but plans to create VR immersive learning curricula for all of its subjects, from architecture to nursing.

“What we’ve been trying to do is find ways to create more learning pathways than the ‘desk bolted to the floor,’” Crow says. “If we accept the model that there are multiple types of intelligence — emotional, tactile, spatial, verbal, etc., then why is our entire college system built on only two — verbal and analytical?”

“With VR/Dreamscape Learn, we are coming full circle and getting back to how we were naturally meant to learn — how we learned for thousands of years — with more emotional attachment.” ■

## Better outcomes

# 4x faster learning with VR

– PWC REPORT

# 8.8%

Improved recall with VR

– UNIVERSITY OF MARYLAND

# 3.75x more emotionally connected to the content when using VR

– PWC REPORT

# 3,000 learners

Point at which VR training becomes 52% more cost-effective than classroom training

– PWC REPORT

# \$34.5B

Estimated worldwide VR total market forecast by 2023

– GREENLIGHT INSIGHTS

## 3

## more virtual spaces to expand and explore

### Tempe, Polytechnic, West, Downtown Phoenix, SkySong and Lake Havasu

Explore ASU in VR or on your personal computer. Immerse yourself at ASU by teleporting into various 360-degree portals. Here you can experience the sights and sounds of ASU up close and personal from the comfort of your home. Created by Meteor Studio and sponsored by Learning Futures Collaboratory. [xr.asu.edu/campus](http://xr.asu.edu/campus)

Find more immersive learning experiences created for ASU learners by ASU students, staff and faculty at [xr.asu.edu](http://xr.asu.edu).

ASU also offers VR field trips including **Red Rocks**, an immersive Mars experience, as part of **Infiniscope**, developed by the School of Earth and Space Exploration.

### Mars, Ceres, Vesta and Earth

JMARS, Java Mission-planning and Analysis for Remote Sensing, is a geospatial information system developed by ASU's Mars Space Flight Facility to provide mission planning and data-analysis tools to NASA scientists, instrument team members, students of all ages and the general public. Desktop and mobile apps set you up to immerse yourself in Mars, Vesta, Ceres and Earth through 3D mapping viewers. JMARS was developed by the Mars Space Flight Facility in the School of Earth and Space Exploration at ASU. [jmars.asu.edu](http://jmars.asu.edu)

### From the rainforest to the inside of a beehive, explore virtual biomes

Through virtual reality tours, you can travel between seasons, learn about venomous creatures in the desert, or shrink down to take a tour inside a beehive. Ask A Biologist was created in the School of Life Sciences as a biology learning resource for students, teachers, parents, and lifelong learners that can be activated on a computer, smartphone, tablet or VR headset. [askbiologist.asu.edu/games-and-simulations/virtual-reality-tours-biology](http://askbiologist.asu.edu/games-and-simulations/virtual-reality-tours-biology)





2 Million Blossoms magazine aims to awaken readers to the vast diversity of pollinating insects and animals.

## Inspiration and how-to tips for saving pollinators

Society is facing the mass extinction of wildlife including rhinos, giraffes, tigers, birds and many insects. While the average person may not be able to do much about giraffes or tigers, we can help bees. A new quarterly magazine called 2 Million Blossoms, created by ASU biologist Kirsten Traynor '14 PhD in biology, features photography, writing, design and advice on what you can do to help bees and other pollinators, such as butterflies, moths, hummingbirds, bats and even some unusual pollinators like lizards and mammals. Stories range from rooftop beekeeping to creating more pollinator-friendly urban environments. Traynor is a former editor of the monthly magazine American Bee Journal and the quarterly magazine Bee World.

Digital and print issues available at [2millionblossoms.com](http://2millionblossoms.com).



Supported in part by the Ashton Family Venture track at ASU's Demo Day.

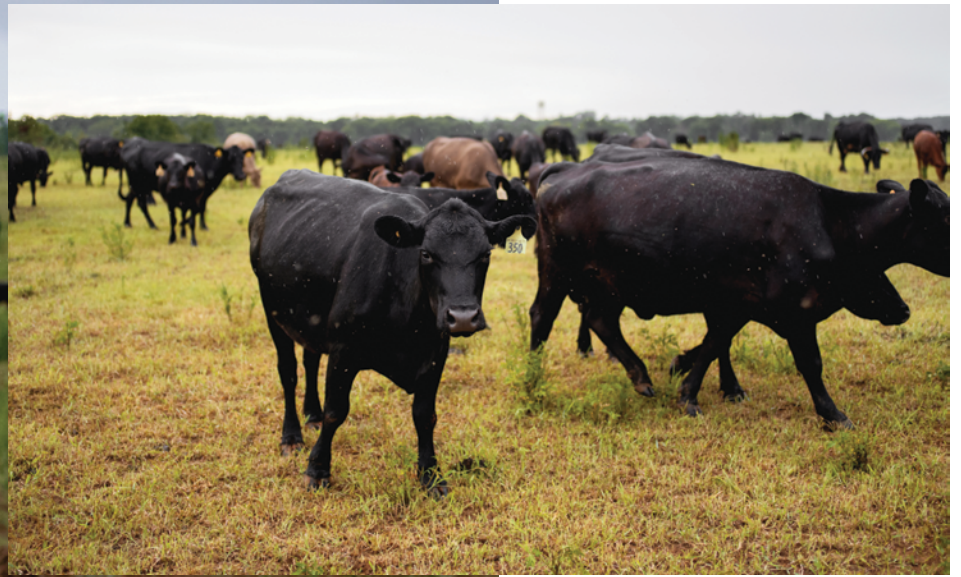
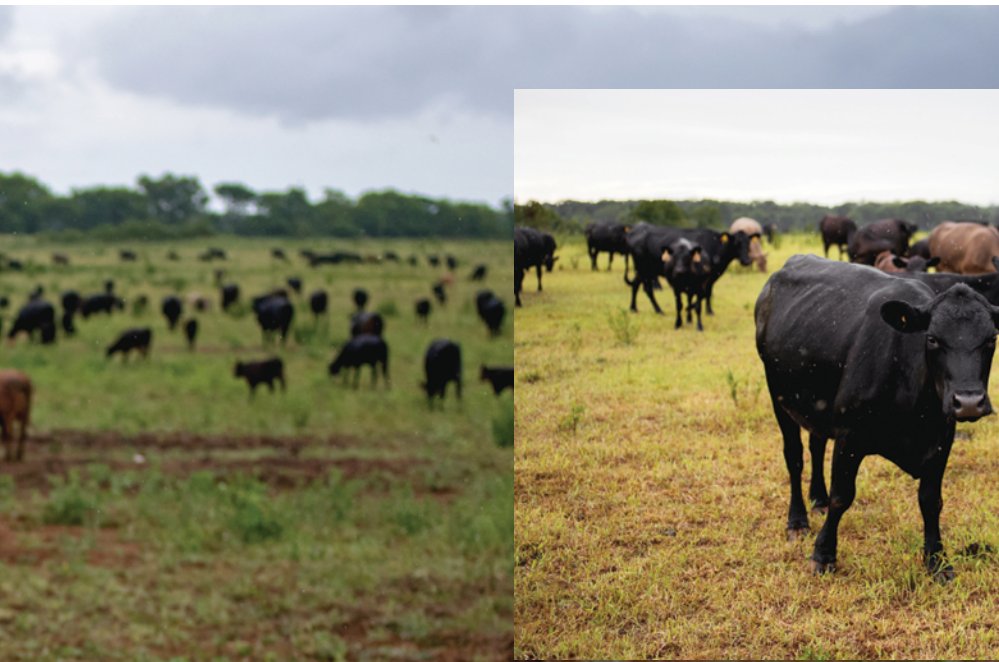
An adjustment to grazing patterns can provide huge returns, both to farmers and the environment

Story by PAUL TULLIS

Photos by JOHNATHON KELSO

# Ranging change





Will Harris, a fourth generation cattleman, practices adaptive multi-paddock grazing at White Oak Pastures in Bluffton, Ga. Regenerative farming methods like AMP are ranked No. 9 on a list of the 80 most effective ways to counteract methane emissions and sequester carbon by Project Drawdown, a nonprofit coalition identifying ways to fight climate change.

## If there were ways

to produce food with improved environmental outcomes, it would be worth doing everything possible, from education to incentives, to help farmers adopt the methods.

That's the aim of Peter Byck, professor of practice in the College of Global Futures' School of Sustainability. An award-winning documentary filmmaker, Byck joined the faculty in 2013 after his climate change solutions film "Carbon Nation," caught the school's attention. With a dual appointment in the Walter Cronkite School of Journalism and Mass Communication, he teaches students to make short documentaries about sustainability.

As Byck showed "Carbon Nation" around the world over the years, one aspect of climate change that people wanted to talk about again and again was soil health. Many agricultural practices damage soil and release stored carbon, but evidence suggests that alternative practices, broadly known as regenerative agriculture, can repair and sequester carbon. A strong scientific consensus has emerged



This project is supported by the Rob and Melani Walton Sustainability Solutions Service at ASU, corporations and private individuals.

that not only must new emissions be curtailed, but current concentrations should be stored underground, where it can't warm the climate or damage ocean habitats.

Regenerative agriculture to improve soil, Byck says, "just kept coming up."

With a grant from the Rob and Melani Walton Sustainability Solutions Service at ASU, Byck brought together scientists to design a research project to compare adaptive multi-paddock grazing with conventional methods. He has since produced 10 short films on AMP grazing, collectively called "Carbon Cowboys."

Even as the goal was initially to help solve climate change, Byck says, "We think we've found a way to increase ranchers' profitability." That was key to getting stakeholder participation in parts of the country that have not been receptive to global warming messaging. "When we talk to farmers, it's, 'We'll show you the data and you can ask any question. And the science will guide us.'"

### **Inspired by bison's grazing patterns**

For tens of thousands of years, as many as 50 million bison roamed the Great Plains. Herds would graze a small area, move on to a neighboring or nearby pasture and repeat — sometimes not returning to the same grasses for months or years. Their hooves trampled grass, helping the soil hold water by protecting it from evaporation while keeping the ground cool and providing habitat for other animals. Bison also kicked up dirt, loosening seeds and enabling them to germinate. Their excrement fertilized



**"It works every time, in every environment, on every continent, and in every climate. I've never seen anything that has this type of impact."**

— ALLEN WILLIAMS,  
RANCHER-SCIENTIST

soil. And their continual departure to new pastures gave land time to recover. There's evidence from researchers in Yellowstone National Park that bison in the wild still naturally graze in a way that provides these benefits.

Livestock have since overwhelmingly replaced the bison, but cattle typically aren't managed in a way that's healthy for the soil, leading to overgrazing and putting the Great Plains at high risk for desertification.

Conversely, AMP grazing mimics bison's activity to improve soil health. Ecosystems evolve in response to the conditions they are exposed to, and when something closer to the historical norm is recreated through regenerative grazing, the soil provides more, and more diverse, forage. More

forage allows the soil to sequester more carbon, while retaining more water and preventing pollutants from leeching into water supplies and aquatic habitat. Biodiversity also reduces topsoil erosion. The bison did it all without conventional ranching's chemical fertilizer, pesticides, irrigation or antibiotics.

Allen Williams is a former faculty member at Louisiana Tech and Mississippi State, and a sixth-generation rancher featured in the "Carbon Cowboys" series. "In our research, we started to see that we were making our soils, our plants and our animals more reliant on all of these inputs," he says. "And as soil health was going downhill, ecosystem health was going downhill and animal health was going downhill."

The solution Williams arrived at, and which he has since taught to thousands of ranchers who together manage more than 1 million acres, is AMP grazing. Ranches are divided into small paddocks, some as small as a half-acre. Cattle are packed densely into one paddock at a time and allowed to graze intensively. At least once a day they are sent into a new field, and the process repeats.

On an AMP ranch of 5,000 acres, a paddock might see fewer than 35 days of grazing over a dozen years. The rest of the time, it's growing back. Plant species that take longer to grow get a chance; some of these may be more drought-tolerant. Some are legumes, which fix nitrogen in the soil, reducing the need for fertilizer. And, says Williams, "Soil that functions properly, that has high microbial or biological activity, confers a much higher level of disease and pest

resistance.” This results in less need for chemical pollutants like pesticides and fungicides.

“Why do I want to spend thousands of dollars on synthetic fertilizer when I can grow these crops for the cost of the seed, and they’ll make nitrogen for me, and livestock will come around and eat these plants and convert it to dollars?” says North Dakota rancher Gabe Brown in “Soil Carbon Cowboys.”

### Offsetting carbon emissions

With Earth’s population estimated to exceed 9.5 billion by 2050, and the need to keep warming below a certain level to preserve a livable world, feeding people without increasing greenhouse gas emissions will be crucial. The Food and Agriculture Organization of the United Nations says that livestock are responsible for almost 15% of humanity’s carbon output, with beef cattle accounting for 42% of that amount.

“If you change about 25% of American land that’s in grazing right now, with that 3 tons per hectare per year, you draw down a billion tons of carbon dioxide annually,” Byck says. That’s about a fifth of total U.S. carbon dioxide emissions. “If all U.S. farmers change to this method of grazing, it can make a huge impact.”

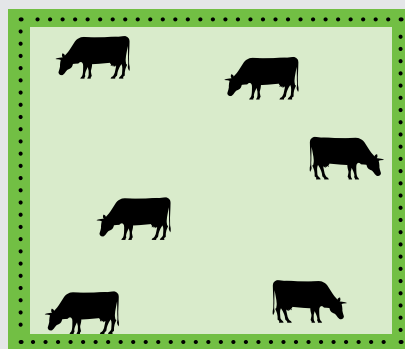
That might be one reason companies like agribusiness giant Cargill are interested. In September, it joined with the World Wildlife Fund and other companies to collectively provide \$6 million to train ranchers in more-sustainable grazing practices. It’s also one reason McDonald’s is the largest funder of Byck’s research project.

## The benefits of AMP

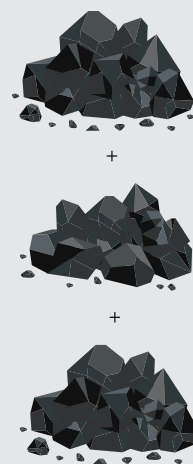
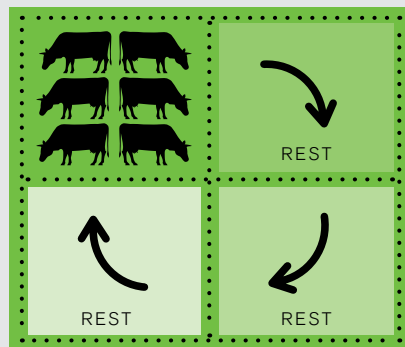
**On an adaptive multi-paddock ranch of 5,000 acres, a paddock might see fewer than 35 days of grazing over 12 years. Cattle are packed densely into one paddock at a time and at least once a day are sent to a new field, allowing land to regenerate.**

**AMP eliminates or reduces the need for fertilizer, which in turn, reduces some of the carbon emissions associated with ranching.**

CONVENTIONAL



ADAPTIVE MULTI-PADDOCK



**Holds 3 tons more carbon per hectare per year than traditionally grazed land**

— PEER-REVIEWED TEXAS STUDY

**Increases soil’s organic matter, holding 20,000 gallons more water per 1% increase in organic matter. This can help to reverse desertification of overgrazed land.**

— UNIVERSITY OF ILLINOIS RESEARCHERS

Byck says the company has realized “their supply chain is not resilient when you’re dealing with climate change, and degraded, unhealthy soils. We’re not afraid of working with big companies — I like to figure out ways to use these giant levers to get change.” The films, in turn, serve as a way to raise money for more research from companies with a stake in ranching, carbon mitigation or both.

The films also draw funding from individuals. Helping to fund the project are ASU supporters Don and Bill Budinger, founders of the Rodel Foundation of Arizona; longtime supporters of Byck’s work, Paula and Jim Crown; and Byck’s friend from childhood, Stuart Brown, and his wife Joanna.

A question from critics of AMP is whether the practice helps reduce methane, which is 25 times more potent than CO<sub>2</sub> as a greenhouse gas; half of cattle’s greenhouse gas emissions come from the methane cattle burp out, according to the FAO. But then, maybe regenerative grazing doesn’t have to solve for methane, as certain supplements may reduce cattle’s methane emissions.

AMP grazing seeks to improve degraded soil, not convert forests or wild grasslands to rangeland. These natural areas are absorbing carbon — with each 120-year-old forest sequestering about 4 tons per hectare per year and undisturbed grasslands and riparian areas perhaps sequestering even more — and so need to be left undisturbed so they can keep on doing that, while also providing critical habitats for thousands of species.

Byck is excited for the beneficial changes AMP is having and

## Watch the films

Go to [carboncowboys.org](https://carboncowboys.org) to watch the 10 short films that collectively make up the “Carbon Cowboys” series from adaptive multi-paddock ranchers across North America.



“I Sell Water and Sunshine” features Doug Peterson at a farm in Newtown, Mo.



The series trailer explains how adaptive multi-paddock ranching mimics wild bison’s grazing patterns.



“A Fence and an Owner” features the Ranney Ranch in Corona, N.M.



**“Why do I want to spend thousands of dollars on synthetic fertilizer when I can grow these crops for the cost of the seed, and they’ll make nitrogen for me and livestock will come around and eat these plants and convert it to dollars?”**

— GABE BROWN,  
NORTH DAKOTA RANCHER

is leading a research project involving eight universities comparing AMP with conventional grazing. “We saw the farmers practicing AMP having tremendous successes, but there was very little in the scientific literature on AMP grazing. So with the support of McDonald’s, Foundation for Food and Agricultural Research, ExxonMobil, Wrangler, Timberland and Cargill, our research began in 2018, and we will begin submitting manuscripts for peer-review in 2021.” Byck is also producing a new documentary on this research.

The ranchers featured in Byck’s films who’ve adopted AMP are convinced. “If the principles of soil health and the rules of adaptive stewardship are implemented,” Mississippi rancher-scientist Allen Williams says, “it works every time, in every environment, on every continent, and in every climate. I’ve never seen anything that has this type of impact.” ■

**“We’ve created a tradition here ...  
that’s second to none.”**

– STEVE LOY, COACH WHO LED MEN’S GOLF TO ITS FIRST NATIONAL TITLE IN 1990 AND IS A MAJOR SUPPORTER OF THE PORTRAIT PROJECT

# Play like a Sun Devil®

## GOLF

### Building a gallery of Sun Devil greatness

Kyle Lucks’ first piece of commissioned artwork came when he was in fourth grade, when the 9-year-old painted a picture of global superstar Michael Jordan.

“It’s where it all started,” Lucks says. More than two decades later, it has paved the way for his production of incredible paintings and murals, of athletes, musicians and presidents. It also brought him back to an old home at ASU, where Lucks, a 2008 graduate, recently finished a wall of murals, the Sun Devil Golf Gallery, for the Phil and Amy Mickelson Player Development Facility.

“All these players and all these kids that walk through this thing for decades will be inspired,” says men’s golf coach Matt Thurmond.

– GRIFFIN FABITS

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### Sun Devils in the pros

Four more  
football stars  
make it into  
the NFL.

**62**

### 2026 Final Four

Women’s  
NCAA top  
teams will  
battle it out in  
Arizona.

**63**



#### Men's Basketball

## Ultimate tip-off honor: Remy Martin named AP Preseason All-American

He earned Pac-12 Sixth Man of the Year in his freshman season. Next up second-team All-Pac-12 in his sophomore season.

Junior season ... an easy pick for first-team Pac-12 honors.

In his senior season in 2020–21, Remy Martin has taken the next step before the season started, as he earned Associated Press Preseason All-America honors, just the second Sun Devil to earn the honor joining Ike Diogu prior to the 2003–04 season. He becomes just the fourth Pac-12 player to earn the honor in the past dozen seasons.

Martin led the team in 2019–20 in road scoring at 15.0 ppg and has shown it all in his three years, as ASU has become the most entertaining squad in the Pac-12 (highest scoring squad in the Pac-12 over the past three seasons).



Brandon Aiyuk, #2, went from a star wide receiver for ASU to the San Francisco 49ers.



Eno Benjamin, #3, is now a running back for the Arizona Cardinals.

# Sun Devils on NFL rosters

Four new Sun Devils enter the league this season, including two picks in the 2020 NFL draft. Running back Eno Benjamin and wide receiver Brandon Aiyuk went from starring on Saturdays in Tempe, to going head-to-head in the NFC West. The Arizona Cardinals selected Benjamin with the 222nd pick in the seventh round back in April, while the division rival San Francisco 49ers used the 25th overall pick on Aiyuk.

The success in the NFL draft and heavy presence in the league continues an exciting trend that has formed for Sun Devil Football under the direction of Herm Edwards.

Eno Benjamin defied the odds and earned a spot on the Cardinals initial 53-man roster. Earlier in training camp, Benjamin credited Edwards for his ability to adjust to the NFL game.

The newest Sun Devils in the NFL are not the only ones making Arizona State proud. League veterans Lawrence Guy, Zane Gonzalez, Jamil Douglas, Matt Haack, Renell Wren, N'Keal Harry and D.J. Foster have proven themselves to be consistent contributors to NFL teams.

More at [thesundevils.com/sports/football](https://thesundevils.com/sports/football).

## Pivoting in a time of crisis, Sun Devils serve remotely

When defensive lineman Corey Stephens joined the Sun Devil Athletics Tip of the Fork leadership development program, he envisioned building leadership skills through community service. What he didn't envision was a global pandemic that would delay his volunteer work. But true to its mission, student-athletes were able to serve their community and stay safe for competition. Each senior researched one state's voting regulations and created a voter guide for ASU student-athletes and their home states.



Thanks to an endowment gift from ASU supporters Jeff, '70 BS in accounting, and Melodee Cooley, '71 BA in education, Tip of the Fork has expanded to include leadership development, community service and scholarship support for student-athletes.



**Alumni**

## From chasing to racing: Former defensive end Mills finds thrills in NASCAR

During Kellen Mills' journey from college football to the construction industry, he made a pit stop that changed his life.

At ASU, he played a pivotal role as a walk-on defensive end. The ASU weight room is where his head strength coach at the time, Joe Kenn, took notice of the 6-foot-3 Mills' character and potential as an athlete.

"He came in with a great work ethic," Kenn said. "He was a local kid, came on as a walk-on, worked his way into a good role for us and parlayed that hard work and determination into being a professional athlete."

Kenn, who served as the Carolina Panthers' strength and conditioning coach following his tenure at ASU, established relationships within the NASCAR world during this time and ultimately put Mills in contact with various pit crew coaches across the sport.

Through Kenn's connections, Mills was offered the opportunity to work for a NASCAR pit crew.

Now a member of a team, he says, "I've worked on some of these phenomenal teams that have, on the track, been able to really get things done."

— COLE CUSUMANO/CRONKITE NEWS



Former football player Kellen Mills hurries across Denny Hamlin's No. 11 race car during a pit stop. He has made a successful transition to using his athleticism for NASCAR.



## All-time best Graduation Success Rate

Sun Devil Athletics has earned a new all-time high of 89% Graduation Success Rate for its student-athletes, announced by the NCAA.

"For the 12th consecutive year, SDA has maintained or increased its GSR. The Office of Student-Athlete Development, led by Andrea Lore, continues to be a catalyst for this great work, in partnership with our coaches, the campus community, and student-athletes," says Jean Boyd, deputy athletic director and chief of staff.

Sun Devil Athletics' GSR has risen 20% since the metric was first introduced by the NCAA in 2005 and ASU set a new goal of 90% after beating its original goal in 2012.

**Keep up with  
Sun Devil  
Athletics news  
and videos  
at [thesundevils.com](https://thesundevils.com).**

**Women's Basketball**

## 2026 Women's Final Four coming to Arizona

Phoenix has been named the host of the 2026 NCAA Women's Final Four. ASU will serve as the host institution. The national semifinals are set for Friday, April 3, 2026 at the home of the Phoenix Suns and Phoenix Mercury in downtown Phoenix, with the national championship game tipping off on Sunday, April 5.


It will mark the first time that Phoenix has hosted the nation's top collegiate women's basketball championship, which has not been staged in the West since 2012.

"Hosting major events is in our DNA — and we can't wait to add the Women's Final Four to our resume. We thank our stakeholders for their strong support of this successful bid," says Brooke Todare, co-chair of the Phoenix Local Organizing Committee.

"This is a landmark day for ASU," says Ray Anderson, ASU vice president for university athletics and PLOC co-chair. "We will apply our trademark innovation to provide an unforgettable experience for the NCAA, student-athletes, alumni, media and fans. We thank the NCAA for entrusting the Valley with this iconic championship."

"We have always said the transformation of our downtown arena was not simply about the Suns and Mercury but about elevating the city of Phoenix's ability to bring major acts and events to Arizona," says Jason Rowley, president and CEO of the Phoenix Suns and Phoenix Mercury. "We are proud to have worked with the city and ASU on this bid."

The 2026 Women's Final Four completes Arizona's resume as the nation's leading destination for major championships. The Valley will be the site of the 2023 Super Bowl and the 2024 NCAA Men's Final Four. ASU is also hosting the 2021 and 2022 NCAA Division Men's and Women's Golf Championships in Scottsdale.



Students practice within their 6-foot spaces during dance class in November at the ASU Tempe campus. The classroom takes precautions including marking out spaces and disinfecting the room after each class.

**We have “created this little safe space that people feel like they can really move ... There’s a lot more space than I was expecting, and so the parameters create freedom.”**

— CARLEY CONDER, CLINICAL ASSISTANT PROFESSOR IN THE SCHOOL OF MUSIC, DANCE AND THEATRE

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<sup>1</sup>Savings validated by countrywide survey of participating new customers from 3/1/2018 to 3/1/2019 who switched to Liberty Mutual and saved. Savings may vary. Comparison does not apply in MA. <sup>2</sup>The property damage must be covered by your policy, and repairs completed by a Guaranteed Repair Network Vendor. Guaranteed Repair Network not available in Rhode Island or Massachusetts. In Massachusetts we offer you our Superior Service Program (SSP), which is similar to the Guaranteed Repair Network, however, the estimate is completed by a Liberty Mutual appraiser. For more information, speak with your Liberty Mutual Claims Representative. <sup>3</sup>Not available in all states. Coverage provided and underwritten by Liberty Mutual Insurance and its affiliates, 175 Berkeley Street, Boston, MA 02116 USA. Equal Housing Insurer. ©2019 Liberty Mutual Insurance 12877362 This organization receives financial support for offering this auto and home benefits program. AFF686950-11 CW-AH 2019/09



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# what's next



[corporate.asu.edu/reopen-business](https://corporate.asu.edu/reopen-business)

In 2020, we've all asked the same question – what's next? ASU is putting innovation to work to help your business navigate operations during the COVID-19 pandemic. Next is expert-driven solutions, customized to your individual needs. Contact us to reopen your workplace with us. **Together, we can move our economy forward.**