ASU Thrive

ARIZONA STATE UNIVERSITY
Volume 29 Number 1

Year in review 2025

Highlights from another year of breakthroughs

A nationwide breakthrough for surgeons using 3D hearts

History: Antivenom has saved numerous lives

FROM COLLEGE TO K–12

The Dreamscape effect

ASU and Hollywood creatives are rewriting the script on how students of all ages discover science

Arizona State University

Scan with your smartphone camera to view the digital edition.

A powerful step forward

Donor's generosity builds the future of health, advances technology for good

"I don't think there's any other place in the entire world where you can make as much difference as contributing here."

Lu Baird, ASU donor, lifelong science advocate

A lifelong career in technology and a love of science inspired Lu Baird's recent gift to the ASU Biodesign Institute, creating the Baird Family Biodesign Support Fund. This gift comprehensively supports research and discovery at the institute, including a first-of-its-kind laser for improving the treatment of diseases.

Baird's generosity will empower individuals at the forefront of the institute's work, uncovering breakthrough medical solutions and technologies to help the environment.

This is our moment. Many donors support meaningful causes through gifts from their will or trust. Planned gifts like Baird's are changing futures, one discovery at a time. Explore how you can make an impact at asuchangingfutures.org.

Lu Baird (left) talks with ASU Biodesign Institute Executive Director Dr. Joshua LaBaer. Learning more about the institute's research inspired Baird's generous gift that includes support for the new compact X-ray free electron laser (below). Photo by Andy DeLisle/ASU

Scan the code to follow the latest stories of impact.

ASU's Changing Futures campaign is shaping a world of opportunity, sustainability and transformational possibilities for people and communities everywhere.

ASU Arizona State University

Changing Futures
From Arizona. For the world.

Contributors

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.

Bret Hovell
An Emmy Award-winning journalist who covered the White House, the Capitol and national politics for CBS News and ABC News, Hovell has spent the last decade working in higher education.

Jeff Newton
An editorial and commercial photographer, his clients include Google, adidas Originals, The New York Times, Sports Illustrated, Men's Journal, Popular Science and Forbes.

Daniel Oberhaus
A former staff writer at Wired magazine and founder of the deep tech PR and marketing agency HAUS, he is an ASU alumnus, '15 BA in English (creative writing) and philosophy, and a graduate of Barrett, The Honors College.

Douglas C. Towne
A longtime contributor to Phoenix magazine, Douglas C. Towne cofounded and serves as the editor of Arizona Contractor & Community magazine. The periodical received the Al Mérito Award from the Arizona Historical Society in 2022, marking the first time a publication had earned the honor in the award's 52-year history.

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ASU Thrive is paper neutral. This issue replanted **2,530 trees** which is equivalent of **210,307.5 pounds** of paper.

Momentum powered by your generosity

This year has been a record-setting one for ASU — not simply because of the magnitude of support we've received, but because of what that support will enable us to do.

It is with deep gratitude that I acknowledge the two largest philanthropic investments in ASU's history — gifts that are meaningfully transformative in their vision and scope.

Because of the extraordinary generosity of the Rob Walton Foundation, we have launched the Rob Walton School of Conservation Futures. The College of Global Futures was also renamed to be the Rob Walton College of Global Futures. Rob's long-standing partnership with ASU has helped to place us at the forefront of sustainability leadership. With this new school, we will empower the next generation of conservation scientists — individuals who will understand how to balance the demands of human progress with the preservation of our natural systems.

At the same time, we took another major step in advancing ASU Health by officially announcing the John Shufeldt School of Medicine and Medical Engineering. John's dedication and multidisciplinary experience embodies exactly what this school is designed to achieve: physicians and leaders who are both technically expert and broadly capable in innovation and systems thinking.

In October, the school gained preliminary accreditation — a critical milestone — and we are now recruiting our first cohort of medical scholars to begin next fall. We are moving at what I call ASU speed — fast, focused and forward-looking.

I want to express my deepest appreciation to Rob, John and every donor, partner and member of the ASU community. Our world is changing at an unbelievable rate — technologically, environmentally, socially. And ASU is moving even faster to ensure that we are of service in helping people prepare for what comes next.

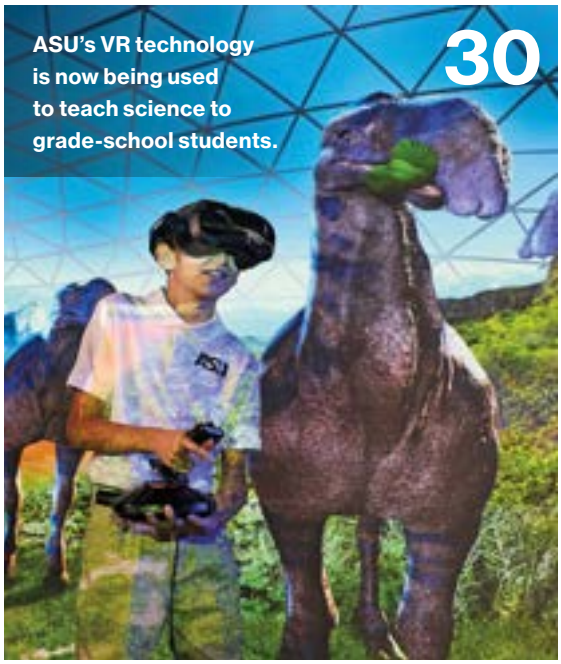
Together, we are designing a future defined by opportunity, inclusivity and innovation. And I could not be more grateful for your continued support as we change the future for people and communities everywhere.

Michael M. Crow
President, Arizona State University
michaelcrow michaelmcrow
asuprescrow presidentcrow

Contents

Every April, Pat's Run honors the legacy of former Sun Devil Football star Pat Tillman. All proceeds from the event benefit Arizona veterans.

BRUCE YEUNG



Connect with ASU

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JEFF NEWTON; SABIRA MADADY/ASU

Events

Allen Mukeba, forward, graduate student

Last-Tear Poa, guard, fifth year

Honor the legacy of MLK

The 35th annual MLK March on West features a musical program and a re-creation of Martin Luther King Jr.'s "I Have a Dream" speech from the pivotal 1963 March on Washington.

Wednesday, Jan. 21, 9 a.m.–noon, Kiva Courtyard, 4701 W. Thunderbird Road, Glendale
mlk.asu.edu/event/mlk-march-on-west

Free Family

Visit asuevents.asu.edu for events. Visit sundevils.com for athletics.

Tip off in Tempe

Cheer on Sun Devil Basketball this season as Head Coaches Molly Miller and Bobby Hurley aim to bring both teams to victory.

Women's basketball: Wednesday, Jan. 28, 6:30 p.m., Desert Financial Arena, vs. Arizona
Men's basketball: Saturday, Jan. 31, noon, Desert Financial Arena, vs. Arizona
sundevils.com

Family Ticketed

The ultimate whodunit

The hit Broadway show "Clue" is taking the stage at ASU Gammage this season. This classic murder mystery will keep you guessing until the final twist.

Tuesday, Feb. 17–Sunday, Feb. 22, ASU Gammage
asugammage.com

Family Ticketed

Fashion and nostalgia in the '90s

Explore the lasting influence of '90s fashion at ASU FIDM Museum's spring exhibition featuring the work of designers Vivienne Westwood and Gianni Versace, among others.

Thursday, Feb. 19–Saturday, July 18, ASU FIDM Museum, 919 S. Grand Ave., Los Angeles
asufidmmuseum.asu.edu

Free Family

SUN DEVIL ATHLETICS; EVAN ZIMMERMAN FOR MURPHYMADE; MICHEL ARNAUD

Tee up for Sparky's Fairway

Practice your shot as you hit golf balls from an elevated platform onto Frank Kush Field during this driving range event.

Friday, Feb. 20–Sunday, March 15, tee times vary, Mountain America Stadium

asu365.events

Family Ticketed

Bringing the founders' ideas to life

Explore the ideas that shaped our nation's founding and guide civic life today in "What the Founders Meant by 'Happiness': A Journey Through Virtue and Character." The course is curated in partnership with the National Constitution Center.

constitutioncenter.org/forms/civic-virtue-online-course

Free Online Self-paced

Revolutionizing learning together

Join educators, entrepreneurs, investors, policymakers and technologists at the ASU+GSV Summit to explore how the fusion of ideas and technology, including AI, is redefining the future of learning.

Sunday, April 12–Wednesday, April 15, Manchester Grand Hyatt, San Diego

asugsvsummit.com

Ticketed Networking

PAT'S RUN

Stride for good

Join Sun Devils and supporters for the 4.2-mile run that honors Pat Tillman's legacy. All proceeds help support the Pat Tillman Foundation's mission of scholarship, leadership and service.

Saturday, April 11, 7:05 a.m., Tempe campus

pattillmanfoundation.org/pats-run

Family Ticketed

Stepping up for the planet

Take 3.5 laps — or 1.5 miles — around Mountain American Stadium this Earth Day to symbolize the urgent need to limit global warming to 1.5 degrees Celsius above preindustrial levels.

Wednesday, April 22, time TBD, Mountain America Stadium

cfo.asu.edu/campus-sustainability-events

Free Family

Reward yourself

Look for Sun Devil Rewards in the ASU Mobile App for event check-ins, VIP experiences, exclusive Sun Devil merchandise and more!

sundevilrewards.asu.edu

TIM TRUMBLE; EDPLUS; BRUCE YEUNG

Makaela Ross, a fourth-year ASU neuroscience major with a psychology minor, offers a fish to one of the 35 African penguins in a colony at OdySea Aquarium in Scottsdale.

News

ANIMAL CARE

Saving endangered species right at home

When ASU student Makaela Ross reports to work each day, 35 pairs of wide, black eyes are waiting.

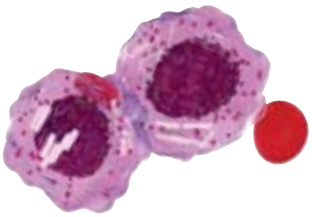
"It's like working with 35 toddlers," she says, laughing as she describes her days caring for a colony of African penguins at OdySea Aquarium in Scottsdale, Arizona.

Ross, an undergraduate transfer student studying neuroscience with a minor in psychology, began an animal care internship at OdySea in summer 2024. Before her internship ended, she accepted a full-time position as an animal care specialist for the endangered birds.

Through careful observation and positive reinforcement training, Ross and the care team keep the colony healthy, while OdySea works to conserve the species as an Association of Zoos and Aquariums-accredited institution.

Learn more at news.asu.edu/saving-penguins.

CHARLIE LEIGHT/ASU



New low-cost test can help guide cancer treatment

Scientists at ASU are part of an international team that have developed new ways to reveal when a cancer began and how quickly it's progressing.

Understanding how cancer evolves can help predict how a patient's disease might progress in slow-growing cancers, especially certain blood cancers where treatment isn't always started right away. It can also predict how an individual might respond to treatment, reducing the need for repeated, invasive biopsies.

To trace this evolutionary history, the research team analyzed subtle changes in tumor DNA called methylation from over 2,000 patients with blood cancers like leukemia and lymphoma. Methylation testing is widely available, making it cost-effective for large-scale use.

These findings could enable more personalized and effective treatments, even for cancers resistant to today's therapies.

Learn more at cancer-insights.asu.edu.

Urban planning doctoral student Natalia Arruda, of Brazil, points out areas on a larger map at a YouthMappers session.

Map data will help pedestrians better navigate Phoenix streets

In a car-dominated city like Phoenix, it can be easy to forget that pedestrians rely on sidewalks to get around.

That's why over several semesters, ASU's YouthMappers — in partnership with Meta and OpenStreetMap — mapped more than 1,200 miles and 10,000 crosswalks across the Valley to make it easier for people to find their way.

The maps can help:

- **With accessibility:** Non-drivers can find clear routes and safe crosswalks.
- **Provide drivers with information:** Drivers can see where sidewalks are located, which helps them become more aware of pedestrian areas.
- **Tourists:** Visitors can use the maps to explore the city on foot.

Learn more at sgsup.asu.edu/youthmappers.

"The importance of detailed pedestrian mapping cannot be overstated, as it directly impacts urban planning, safety and accessibility."

— CHAD BLEVINS, CO-FOUNDER OF YOUTHMAPPERS

CHARLIE LEIGHT/ASU

Making mandatory device upgrades a thing of the past

Dislike upgrading your device? ASU researchers are building sustainable microchips that could free us from mandatory upgrades for phones, smartwatches and more. These powerful processors will also improve communications for national defense.

Two DARPA-funded projects led to the creation of two chips — DASH and COCHON — that balance power saving with the ability to use more frequencies.

While the government funded these projects to meet defense needs, the chips have so many practical uses that they could eventually reshape consumer technology.

The DASH chip could improve cell service for rural areas, lower electric bills and allow us to update our device capabilities, like adding 6G to a 5G phone, without replacing the device itself.

The team is now testing prototypes from both projects.

Learn more at wisca.asu.edu.

The DASH chip (pictured) could let users update their device capabilities without replacing the device itself.

DANIEL BLISS/ASU

Predicting wildfires before they happen

Researchers at ASU are using artificial intelligence to help predict wildfires in Alaska before they start. The state has experienced three of its four largest fire seasons in the last 25 years.

Switching from traditional fuel mapping to AI-generated maps is like going from a blurry road map to Google Earth in high definition, says Professor WenWen Li, the project's principal investigator.

By capturing the fine details of vegetation and fuel, scientists can improve and ultimately protect both civilian and military communities.

Learn more at sparc.asu.edu/research.

"It's not just about saving sea turtles. It's about how we can improve their fishing operations and preserve their livelihoods."

— JESSE SENKO, PRINCIPAL INVESTIGATOR AT THE SENKO LAB

Saving sea turtles

One of the keys to maintaining healthy populations of sea turtles is reducing bycatch, when the turtles become unintentionally tangled in fishing gear.

That's why Jesse Senko, an assistant professor in the School of Ocean Futures in the Global Futures Laboratory at ASU, is working with fishers to develop practical solutions that can be widely deployed to reduce bycatch while maintaining productive fisheries.

One of those solutions is attaching green LED lights directly to nets, which has already reduced the capture of sea turtles and off-target species by 63% during a series of controlled experiments in Mexico's Sea of Cortez.

The researchers are working in North Carolina to help fishers and turtles there. Once more data is collected, Senko plans to use this to bring the product to market.

Learn more at senkolab.org.

> **"[Better sleep] can make people, especially older adults with dementia, happier and the quality of life a little bit better."**
>
> — NINA SHARP
> ASSISTANT PROFESSOR
> IN THE DESIGN SCHOOL

BRIGHT IDEA

Biodynamic lighting can help dementia patients experience fewer symptoms

A research team from ASU has shown how specific lighting conditions can improve symptoms of dementia in older adults.

A study published this summer found that "biodynamic lighting," or lights that mimic the natural rhythms of daylight, improved sleep time by an average of 82 minutes.

Better sleep is critical because poor sleep in dementia patients is tied to depression, anxiety, agitation and reduced cognition.

"Optimized lighting can be a very simple and cost-effective solution to make people happy and healthy and smarter," says Nina Sharp, the primary investigator and an assistant professor in The Design School.

Watch a video of the research in action.

Jason Yeom, an adjunct faculty member in The Design School and study co-author, adjusts lighting in a lab on the Tempe campus.

EJ HERNANDEZ/ASU

Preventing costly pipeline failures with AI and robots

Researchers at ASU are developing new robotic and AI systems to make pipeline inspection faster, safer and more reliable.

From 2002 to 2021, pipeline incidents, including cracks, leaks and ruptures, in the U.S. caused 276 deaths, more than 1,100 injuries and $10 billion in damage.

To combat this, the team developed inchworm-inspired robots capable of navigating pipes that traditional inspection tools can't reach to detect cracks and corrosion. Using the data the robots collect, along with detailed simulations and decades of accident reports, AI models can predict when a pipe will fail and tell researchers how sure they are about the estimate.

The next step is field testing under real-world conditions.

Learn more at robotics.asu.edu.

Stopping tuberculosis in its tracks

Tuberculosis is reemerging across the U.S., but ASU scientists have made a discovery that could help stop it.

Researchers from the School of Life Sciences and the Biodesign Center for Bioelectronics and Biosensors found that combining an experimental compound called diarylthiazole-48, or DAT-48, with existing TB drugs produced stronger results than using any of the drugs alone. The compound works by attacking a molecular system known as PrrAB, essential for the tuberculosis bacterium to generate energy; without it, the cells cannot survive.

The team hopes to use artificial intelligence to improve the molecule and design better versions more quickly.

Learn more at sols.asu.edu and biodesign.asu.edu.

Protecting heat-vulnerable jobs in Arizona

Almost 6% of Arizona workers are being drained by the heat.

A new study by two ASU researchers analyzed more than 16,000 tasks across 663 occupations and determined 31 "dual-impact" occupations that are both highly exposed to heat and, at the same time, essential for heat resilience. These include construction laborers, landscapers, electricians, plumbers, heating and cooling technicians, firefighters, roofers and maintenance workers.

To help keep these workers safe, study co-author Patricia Solís, a research professor in ASU's School of Geographical Sciences and Urban Planning and a senior Global Futures scholar, suggested the following approaches:

- Expand front-line responder capacity during heat waves
- Strengthen workplace heat safety protections
- Target programs and policies to address agricultural worker vulnerability

These suggestions, Solís says, will help inform future policy changes both at the state and employer level to help workers avoid heat-related illness.

Learn more at resilience.asu.edu.

Heat illness is a serious risk for outdoor workers.

COURTESY OF WHITESTORM/ADOBE STOCK AND GENERATED USING AI

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Career

SHAPING THE CITY

‘Train yourself to start with the hardest task’

Ryan Abbott, ’01 BS in construction and ’08 MBA, is transforming the Greater Phoenix skyline. As president of the Southwest region at Clayco, his team has completed 50 projects in the Valley since 2021, including Skye on 6th in Phoenix and Newport Power Industrial in Mesa. The national construction firm reported $7.6 billion in revenue in 2024, and employs about 270 people in Arizona.

“If you start your day by tackling the hardest task, everything else gets easier. You’ll become the person people rely on to get things done.”

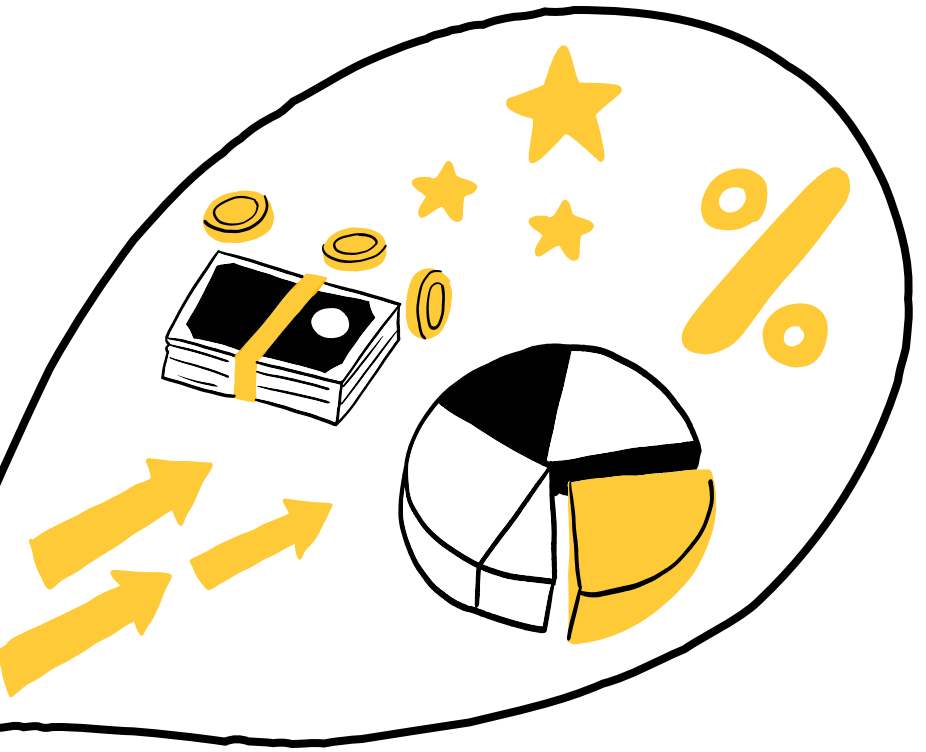
Ryan Abbott leads building projects, including new residences at Tempe Town Lake.

SABIRA MADADY/ASU

Your stakeholder map

How to make sure the right people know your value

Story by MAY BUSCH



Stakeholders are the people who have a say in your work and your career. They're key to your progression and worth having on your side.

However, it can be more complicated than you think to identify them. Even well-meaning people can make the career-limiting mistake of overlooking an entire group of stakeholders.

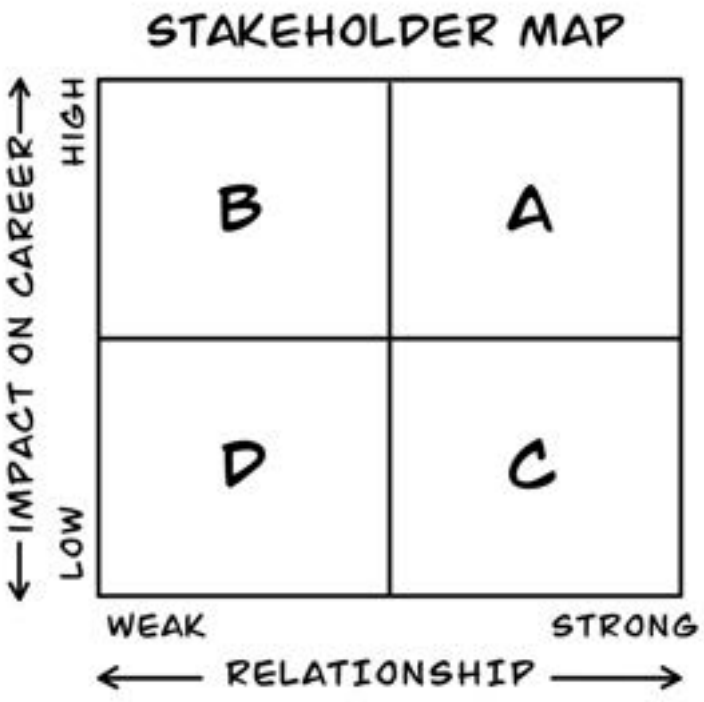
When senior management at Morgan Stanley transferred me from New York to London to start a new business unit, my marching orders were to put together a business plan, build a team and most importantly, get the European bankers on board. They were our entry point to the corporate clients. Without the bankers, we could not succeed.

Armed with a list of our bankers in Europe, I sat down with my colleagues in the U.S. to figure out who had the biggest clients and the "friendlies" versus the skeptics. This prioritization meant I could figure out who to reach out to first – the 20% who were likely to deliver 80% of the business opportunities.

Within the first 90 days of landing in London, I had met with all of them. Little did I know, I had failed to recognize an important set of stakeholders at the firm and that threatened to undermine my success.

May Busch is a former COO of Morgan Stanley Europe, who is now an executive coach, speaker, advisor, author and executive-in-residence in ASU's Office of the President. maybusch.com/asuthrive

Reprinted with permission from "VISIBLE: How to Advance Your Career Without Playing Politics, Selling Your Soul, or Working Yourself into the Ground," chapter 2: Managing Your Stakeholders: Winning Support Without Playing Politics.



Refocusing my priorities

One day, my boss called me into his office. My counterparts in sales and trading were grumbling about me. Six months had gone by and they questioned, "When is she going to start pulling her own weight?"

That's when it hit me: I had taken my assignment too literally. I spent all my time with the relationship bankers without ever meeting with most of the sales and trading leaders. They were paying for half of my business unit but had been left out of the loop.

They were like the 13th slighted fairy in Grimm's "Sleeping Beauty" tale — the one who wasn't invited to the royal christening but crashed the party to put a curse on the princess, causing her to sleep for 100 years before being awakened by a handsome prince. In my case, it was "shape up or be gone" and there was no handsome prince to save me.

So, consider the people you missed. Revisit your list because things change, and every time you have a new project or role, it may involve different stakeholders.

Putting it into practice

Step one **Make a list**

List out the top 5–10 people who have an interest in, are affected by, or can affect what you do and don't do. They can be internal or external to your organization, but their buy-in is crucial to your success. Think about people who:

- Can greenlight your project or kill it
- Can accelerate your progress
- Can set you back
- Can amplify what you do or recommend you to others
- Pay and promote you
- Recognize you for your performance

Step two **Map them out**

Once you have your list of key stakeholders, step back and assess them. Not all stakeholders are created equal. Mapping them out will help you decide where to focus your time, energy and attention.

Build your career toolkit

Try this method the next time you're unsure of which stakeholders should be in your orbit. The full mapping exercise can be found in Chapter 2 of "VISIBLE: How to Advance Your Career Without Playing Politics, Selling Your Soul, or Working Yourself into the Ground." ■

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at thevisiblebook.com.

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Certificate program
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FOR ALL LEARNERS

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askabiologist.asu.edu

Self-paced Online Free

Explore the stars

Unlock the secrets of the solar system and explore space careers in "Countless Worlds in our Solar System: Asteroids, Comets and Meteorites." Eight hours; free; Certificate of Completion available upon completion.

careercatalyst.asu.edu

Self-paced Online Free

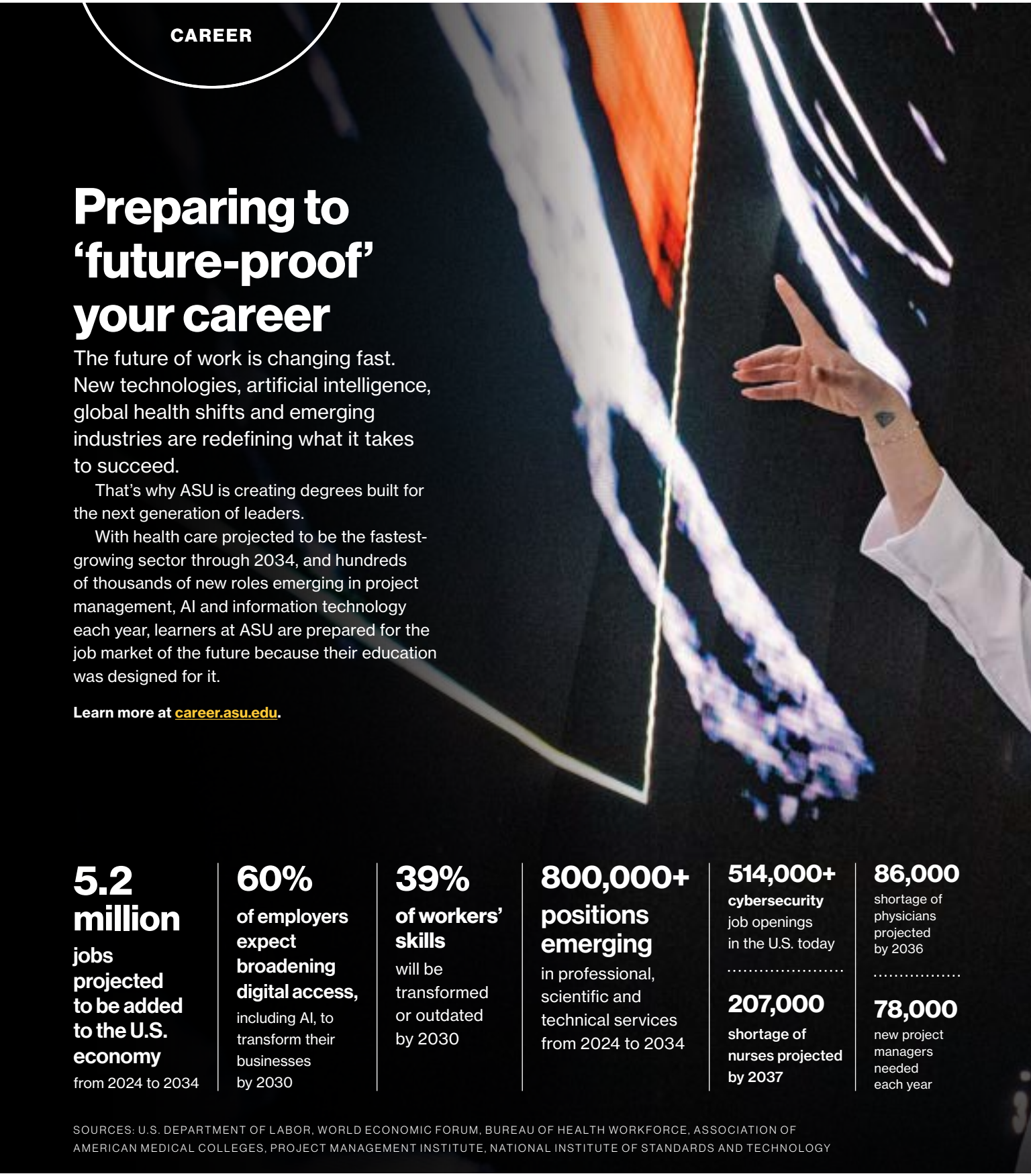
Preparing to ‘future-proof’ your career

The future of work is changing fast. New technologies, artificial intelligence, global health shifts and emerging industries are redefining what it takes to succeed.

That’s why ASU is creating degrees built for the next generation of leaders.

With health care projected to be the fastest-growing sector through 2034, and hundreds of thousands of new roles emerging in project management, AI and information technology each year, learners at ASU are prepared for the job market of the future because their education was designed for it.

Learn more at career.asu.edu.



5.2 million
jobs projected to be added to the U.S. economy
from 2024 to 2034

60%
of employers expect broadening digital access,
including AI, to transform their businesses by 2030

39%
of workers’ skills
will be transformed or outdated by 2030

800,000+
positions emerging
in professional, scientific and technical services from 2024 to 2034

514,000+
cybersecurity
job openings in the U.S. today

207,000
shortage of nurses projected by 2037

86,000
shortage of physicians projected by 2036

78,000
new project managers needed each year

SOURCES: U.S. DEPARTMENT OF LABOR, WORLD ECONOMIC FORUM, BUREAU OF HEALTH WORKFORCE, ASSOCIATION OF AMERICAN MEDICAL COLLEGES, PROJECT MANAGEMENT INSTITUTE, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

MARK PETERMAN FOR FERVOR

Hundreds of thousands of health care roles will be needed in the next 10 years.

Some of the degrees that will get you there

- AI in business
- Engineering management
- Health care administration and policy
- Organizational leadership
- Project management
- Psychology (sports psychology)
- Public health
- Public health technology

Learn more at degrees.asu.edu.

"I really like the on-campus aspect [of the MBA program]. ... It works with my schedule and I don't have to quit my job. I'm able to [attend class] in the evenings, usually one night a week, which helps a lot with arranging child care and commuting from where I live."

— MCKENNAH SCHROEDER, '15 BA IN ENGLISH, MASTER OF BUSINESS ADMINISTRATION GRADUATE STUDENT

"[We were] asked challenging questions that made us think critically about topics like universal basic income, creativity with digital art, cancer detection and job replacement. These conversations connect to real issues in AI and make the [AI in business] program feel relevant."

— JUAN CARRASCO, '25 BA IN APPLIED BUSINESS AND TECHNOLOGICAL SOLUTIONS, AI IN BUSINESS GRADUATE STUDENT

Luis Valledor, Ela Chachulski, Sara Doyle and Isabella Hamamoto, who are pursuing degrees in robotics and autonomous systems, engage in hands-on learning during a robotics class at the new ISTB12 building on the Polytechnic campus.

Review

Accelerating innovation and impact

2025 YEAR IN REVIEW

Creating a brighter future for Arizona, the nation and the world

What moves our state forward is the strength of our aspirations and the shared values that bring us together — good jobs, a healthy environment, fair and just systems, vibrant communities and a strong education system.

In a time of great change when AI is becoming more accessible to all, the landscape of health care is constantly changing and high-tech manufacturing is reshaping local economies, ASU is pioneering new models of education to keep pace and increase accessibility.

This is all to achieve the Arizona We Want, a shared vision for the future of the state, developed by the nonprofit Center for the Future of Arizona, where all residents can enjoy sustained prosperity, unmatched quality of life and real opportunity.

SABIRA MADADY/ASU

Year in review

In the news

Cost-effective drug testing

An ASU researcher developed a technique to detect drug use with just a fingerprint. Completely noninvasive and cost-effective, the method has critical applications in substance-use testing and forensic investigations.

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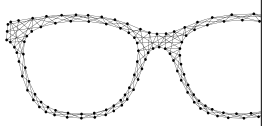


Helping people with vision loss

A new AI assistant developed by an ASU graduate student can act as a guide for people with partial vision loss when paired with smart glasses.

The NASA SPHEREx mission, which will map the entire night sky to gain insight into galaxy formation, took to the skies with help from ASU School of Earth and Space Exploration researchers.

—

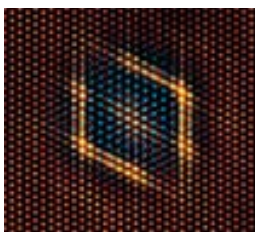
NEWSWELL, expanding support of local journalism

NEWSWELL, a nonprofit launched by ASU and pioneered by local journalists, expands coverage in underserved areas and helps partner newsrooms build more sustainable business models.

Breakthroughs in cancer research

With an estimated 2 million people expected to have been diagnosed with cancer in the United States in 2025, researchers are working to better understand the disease that affects so many lives. Last year, teams at ASU had several notable breakthroughs in cancer research, including:

- Development of a therapy that shrinks tumors by 80% without harming healthy tissue
- Development of a low-cost test that can predict how fast cancer is growing and whether treatment will be needed up to a decade in advance
- Identification of a series of antibodies that could be useful in detecting breast cancer
- Discovery of the link between an indicator of aggressive cancer and the protein's role in activating skin repair cells, suggesting that it could help accelerate wound healing



Researchers at ASU developed a new copper alloy that can maintain exceptional mechanical strength for aerospace industry uses at extremely high temperatures, potentially offering the durability needed for high-speed flight or to deploy weaponry.

ASU PHOTOS

2025

Transforming the future of additive manufacturing

ASU researchers developed an AI system that predicts structures during 3D metal printing, which improves durability and could allow industries like aerospace and defense to create mission-critical parts with greater accuracy and efficiency.

—

Powerful new system to reduce wildfire deaths, destruction

Wildfire Awareness and Risk Management, or WARM, prevents electrical grids from causing additional fires but keeps the power on for as many residents as possible. By using a system of layered sensors, it can alert utilities to reduce power on affected lines only if a fire risk is detected.

Keeping construction teams safe in extreme heat

To help prevent heat-related deaths among construction workers, ASU researchers developed information materials on hydration – offering science-based tips for improving heat tolerance, staying hydrated and learning signs of heat-related illness.

New cutting-edge spaces to live, work and play near campus

Construction wrapped on Novus Place, an entertainment district with restaurants, retail and multifamily housing. It is part of ASU's Novus Innovation Corridor, which is projected to bring more than $4.6 billion in economic impact.

Hunting down drug-resistant microbes

ASU researchers and international partners tested a portable DNA sequencer to track antibiotic-resistant E. coli in Indonesian wastewater, revealing contamination risks and offering a low-cost tool to fight superbugs.

Birth manikin trains nursing students for the delivery room

A specialized birth manikin is giving ASU nursing students realistic training across all pregnancy stages, preparing them to monitor fetal health and manage complications like postpartum hemorrhage during childbirth.

Bringing internet connection to thousands in Arizona

ASU and partners have laid more than 80 miles of fiber infrastructure, distributed nearly 10,000 internet-enabled devices and provided 30,000 hours of digital support.

Reimagining how students learn science with VR

More than 42,000 ASU students have taken a course with Dreamscape Learn. These immersive virtual reality experiences blend emotional storytelling with scientific principles to boost student engagement and performance. In ASU's NeoBio program, which is reimagining how universities teach biology, learners who took Biology 181 with VR earned, on average, a quarter-letter grade higher in their next biology course. The same principles now guide NeoChem, ASU's new approach to teaching chemistry. The learning experiences are available on three campuses and in two mobile units for K–12 learners.

Fast, accurate, low-cost diagnostics

ASU researchers created a low-cost diagnostic test that could transform how quickly and reliably diseases like COVID-19, Ebola, AIDS and Lyme disease are detected, using a single blood drop, delivering reliable results in just 15 minutes.

—

An ASU-led international team discovered a new species of human ancestor by its teeth in Ethiopia, from between 2.6 and 2.8 million years ago.

The teeth were found at the same site as the oldest human jaw bone ever discovered.

In the ASU LENS Lab, robodog Unitree Go2 is using computer vision, language models and adaptive learning to help humanity, from mastering search-and-rescue to assisting people with visual impairments.

A generative AI system developed by ASU researchers successfully created realistic "what-if" images of shade in experiments across 12 cities. This means city planners could use DeepShade to design new "cool corridors" and public spaces that protect vulnerable populations during extreme heat.

Global music star and entrepreneur brings AI tool for creatives to the classroom

ASU is partnering with innovator will.i.am at The GAME School to teach agentic AI, empowering students to collaborate within his FYI.AI app on creative projects, preparing them for the future tech and creative workforce.

—

A specialized camera developed by an ASU team called Mastcam-Z helped NASA scientists select rock samples on Mars most likely to contain evidence of ancient life.

ASU PHOTOS

Materials-to-Fab center opens in Tempe

The new research and development lab was created with Applied Materials, the international semiconductor powerhouse company. It is accelerating early-stage research into industry-ready technologies and future-generation chip development in collaboration with ASU faculty and students.

Industry leaders gathered in Phoenix for SEMICON West, the largest microelectronics trade show in North America. The event, held outside of California for the first time in its 55-year history, highlighted ASU's diverse roles in Arizona's rise as the Silicon Desert.

—

ASU dominated in volleyball in its second season in the **Big 12 as conference champions**, clinching the title in a win versus Houston in November and going 15-1 in conference play.

A new conservation school to support planetary health

ASU's new Rob Walton School of Conservation Futures will train learners from students to executives to develop scalable, adaptive solutions supporting biodiversity and global ecosystem health. The former chairman of Walmart is a longtime supporter of ASU's work at the Julie Ann Wrigley Global Futures Laboratory and is backing the school with the largest gift in university history.

SolarSPELL named a TIME 'best invention'

Hundreds of the solar-powered, offline digital library devices help learners in 15 regions around the globe with limited connectivity access information on topics from health care to sustainable farming.

The new Global Institute for the Future of Energy joins the Thunderbird School of Global Management and the Julie Ann Wrigley Global Futures Laboratory to advance ASU's ongoing efforts in global energy literacy, innovation and education. The initiative was funded by Robert L. Zorich, an ASU alumnus and managing partner of energy investment firm, EnCap Investments.

Omar Yaghi wins the 2025 Nobel Prize in Chemistry for pioneering metal-organic frameworks for work he began at ASU, enabling carbon capture. The research contributed to launching the field of reticular chemistry.

—

Starting in 2026, the newly established ASU London will offer three-year undergraduate programs in business, engineering and computer science, leading to a one-year ASU master's degree in London's global learning environment.

—

The newly accredited John Shufeldt School of Medicine and Medical Engineering at ASU will train physician-engineer leaders to transform health care delivery and education.

Year in review

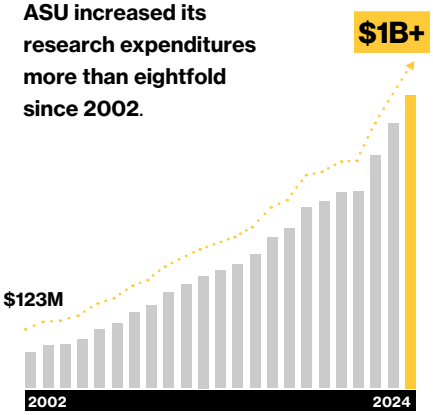
By the numbers

RESEARCH IMPACT

ASU is one of the fastest-growing research enterprises in the U.S.

with more than $1B total research expenditures in FY24

ASU increased its research expenditures more than eightfold since 2002.



SOURCE: ASU KNOWLEDGE ENTERPRISE

Top 10 in the U.S. and #14 in the world for interdisciplinary science

ASU ahead of Michigan, Illinois and Texas

– TIMES HIGHER EDUCATION, 2025

1,700+ new U.S. patents*

with 200 new patents in FY25

– U.S. PATENT AND TRADEMARK OFFICE

*From July 1, 2002 to June 30, 2025

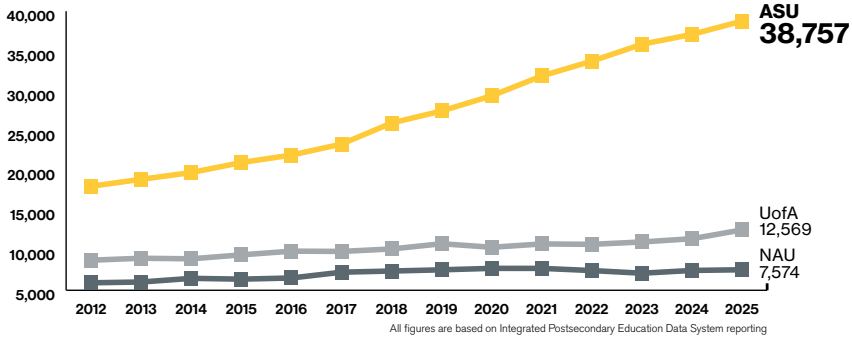
ACADEMICS

Top producer of graduates in the state

ASU annually awards thousands of college degrees to innovators who excel in engineering, business, education, the arts and other fields. In 2024–25, ASU awarded 19 associate, 25,268 bachelor's, 12,401 master's, 779 doctoral and 290 law degrees.

– ASU OFFICE OF INSTITUTIONAL ANALYSIS, UOFA UNIVERSITY ANALYTICS AND INSTITUTIONAL RESEARCH, NAU INSTITUTIONAL RESEARCH AND ANALYSIS

Degrees awarded



All figures are based on Integrated Postsecondary Education Data System reporting

Top producer of elite scholars

For over 10 years, ASU has been a top-producing university for elite scholars, including Rhodes, Marshall, Goldwater, Truman and more. ASU ranks No. 16 overall for Fulbright awards, ahead of UC Berkeley, Duke and Cornell, and is the No. 2 public university ahead of UNC-Chapel Hill and Rutgers.

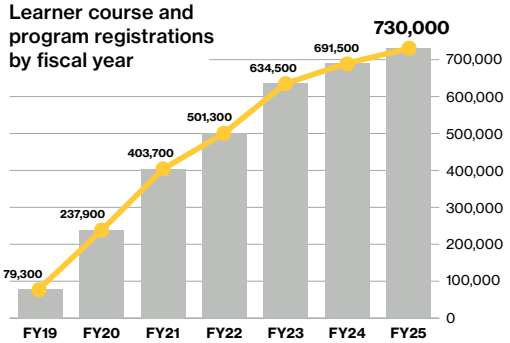
– LORRAINE W. FRANK OFFICE OF NATIONAL SCHOLARSHIPS ADVISEMENT, 2025

Learning at every stage in life

ASU serves learners from K–12, career development and beyond. We're evolving the American research university model, by expanding access to courses, certificates and stackable credentials that support education, work and personal growth. These offerings are created by ASU's schools and colleges and taught by ASU faculty, providing flexible, high-quality learning designed for real-world goals.

– ASU LEARNING ENTERPRISE, 2025

Learner course and program registrations by fiscal year



ASU GRAPHICS

Repeatedly ranked

#1

ASU ranked #1 on 30+ lists in the last 3 years, including these in 2025

#1 in the U.S. for innovation

ASU ahead of MIT and Stanford

– U.S. NEWS & WORLD REPORT, 11 YEARS, 2016–26, THE ONLY UNIVERSITY TO EVER HOLD THE TITLE

#1 in the U.S. for sustainability

ASU ahead of Stanford and UC Berkeley

– ASSOCIATION FOR THE ADVANCEMENT OF SUSTAINABILITY IN HIGHER EDUCATION, 3 YEARS, 2023–25

#1 in the U.S. for global impact

ASU ahead of MIT and Penn State

– TIMES HIGHER EDUCATION, 6 YEARS, 2020–25

Top 10 in the U.S.

ASU has 38 degree programs in the top 10 along with 83 in the top 25

– U.S. NEWS & WORLD REPORT, 2025–26

Learn more at asu.edu/rankings.

#1 in the world for international trade

ASU ahead of Cambridge, Oxford and Columbia

– QS INTERNATIONAL TRADE RANKINGS, 4 YEARS, 2023–26

#1 public university chosen by international students

ASU ahead of Illinois, Purdue and UC Berkeley

– INSTITUTE OF INTERNATIONAL EDUCATION, 5 YEARS, 2021–25

#1 online master's in electrical engineering

ASU ahead of USC, Michigan and Texas A&M

– U.S. NEWS & WORLD REPORT, 2025

#1 university in news

ASU ahead of Syracuse, Florida and USC

– BROADCAST EDUCATION ASSOCIATION, 2025

ECONOMIC IMPACT

#2 in the U.S. for employability

ASU among public universities, ahead of UCLA, Michigan and Purdue

– GLOBAL EMPLOYABILITY UNIVERSITY RANKING AND SURVEY, 4 YEARS, 2023–26

$35 billion ASU's economic impact in the state

8x impact of hosting a Super Bowl

ASU impacts Arizona's GDP through operating and construction expenditures

– ASU OFFICE OF THE UNIVERSITY ECONOMIST, THE SEIDMAN RESEARCH INSTITUTE, FY25

$200+ billion

in private investment has come to Arizona related to semiconductors in the past five years. ASU is a key part of the state's high-tech growth with the nation's largest engineering school and cutting-edge facilities and expertise.

– ARIZONA COMMERCE AUTHORITY

PHILANTHROPY

$630.8M

in new gifts for students, faculty, research and community programs, including the two largest gifts ASU has ever received.

113,000 donors

including individual, corporate and foundation donors.

ATHLETICS

Four teams won Big 12 titles in the first year in the new conference: football, volleyball, and men's and women's swimming and diving. It marked the most conference titles since the department earned five in 2007–08.

Entering the 2025–26 season, **158 Sun Devils have earned Academic All-America honors, the most in the Big 12.**

135 student-athletes earned a 4.0 semester or cumulative GPA. ASU earned the Commissioner's Cup for its academic and athletic excellence and focus on community engagement, mental health and career development.

Cam Skattebo joined the New York Giants in the NFL, and nine Sun Devils were drafted into the MLB.

The economic impact of Sun Devil Athletics

ASU's sports teams give fans plenty to cheer about on the field and off — including the impact they have on the state's economy.

From basketball and football to baseball to gymnastics and hockey, each program contributes to the Valley's economy through ticket sales, tourism and local spending. The ripple effect extends far past campus — fueling restaurants, hotels, retail and jobs across Tempe and Maricopa County.

SO WHAT DOES THIS MEAN FOR THE VALLEY?

In FY25

$99.5M
in state GDP for Maricopa County

$23.6M
spent by visiting fans on overnight accommodations

$62M
in labor income for Maricopa County

1,100+
jobs supported in Maricopa County

Nearly
278,000
fans in attendance across
6 home football games in 2024

$2.5M
in ticket revenue per football game in 2024

$2M
in direct taxes for the city of Tempe

SOURCE: L. WILLIAM SEIDMAN RESEARCH INSTITUTE

The economic impact of Sun Devil Athletics benefits local businesses like Cactus Sports, owned by Troy Scoma, '91 BS in general business (left).

ARON SHER/ASU

“ReMix brings communities together to visualize and prototype futures we all want to live in.”

— STEPHANIE TOMLIN, DIRECTOR OF INDUSTRY RELATIONS FOR THE HERBERGER INSTITUTE FOR DESIGN AND THE ARTS

The MIX Center features motion-capture systems, volumetric video stages and extended-reality labs for film, gaming and design projects.

Visit the MIX Center.

NEW IDEAS

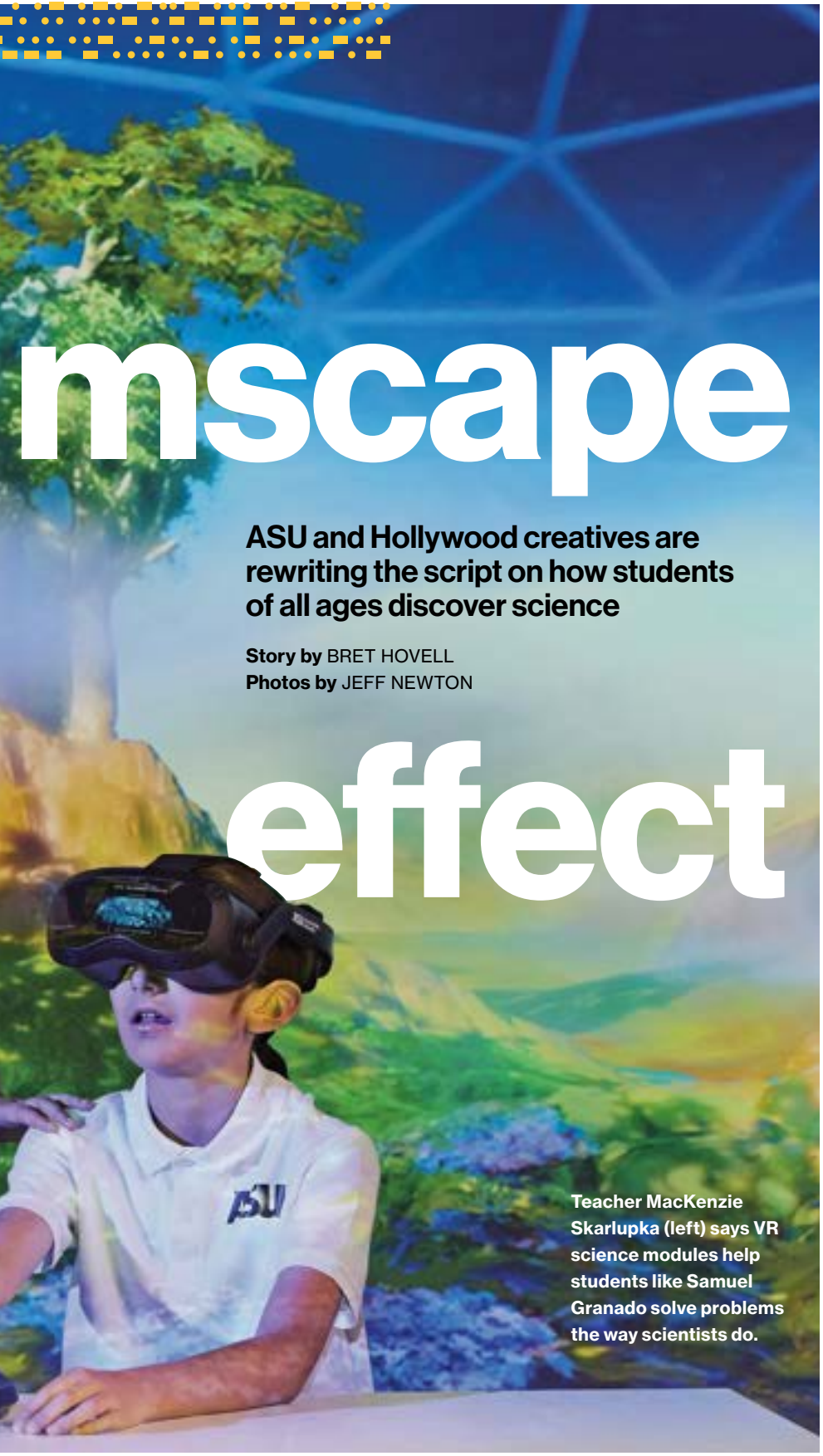
‘Remixing’ a brighter future for Mesa and beyond

Over 200 students, from more than 60 Mesa high schools, along with community members and creative professionals, gathered at the ASU Mesa Center for Creative Technology last fall for “Tech for Change: ReMix the Future.”

Guided by Mesa’s Climate Action Plan, teams created tech-driven solutions to real-world challenges during a four-day sprint, showcasing projects on water scarcity, local food systems and Mesa’s history.

CHARLIE LEIGHT/ASU

The Drea



mscape effect

ASU and Hollywood creatives are rewriting the script on how students of all ages discover science

Story by BRET HOVELL
Photos by JEFF NEWTON

Teacher MacKenzie Skarlupka (left) says VR science modules help students like Samuel Granado solve problems the way scientists do.

Seventh grader

Samuel Granado is a well-spoken and bright student at Villa de Paz Elementary School in Phoenix. But he starts out cautiously when he describes a new virtual reality-enabled science curriculum at his school called Dreamscape Learn.

"I don't want to call, like, regular science class boring," he says. "But Dreamscape is definitely more exciting and fun than, well, a regular science class."

Even his "regular" science teachers are likely to agree.

Because what Samuel and his classmates see when they sit down in Villa de Paz's custom, virtual reality classroom is the vibrant, colorful VR immersive setting for the lab work in their middle school science class.

Steep mountains and craggy rocks populate the landscape. Alien creatures eat from trees with bright orange foliage. In one of the school's learning modules, the students see megaraffes — huge animals that are shaped like a dinosaur but have colorings like a giraffe — moving together in a herd.

The students wear fully immersive virtual reality headsets and sit in chairs that vibrate as they move through the virtual world. They even feel air blowing on them from discreet fans on their desks as they pilot their spacecraft through the VR science modules.

"It's something much more hands-on than, say, a teacher putting up a slideshow and you just writing down notes," says Samuel.

A break with tradition

Dreamscape Learn has launched this new, high-tech curriculum for middle schoolers in the Pendergast Elementary School District, which serves students from pre-K through eighth grade. It has led to high engagement and excitement among a population of students that, almost universally, struggle to care as much about school as they do about all the other things happening in their lives — or on their phones.

"We have seen an extraordinary increase in attendance on days when students are going to be working on Dreamscape."

— JENNIFER CRUZ, SUPERINTENDENT, PENDERGAST ELEMENTARY SCHOOL DISTRICT IN WEST PHOENIX

Dreamscape Learn is a partnership between ASU and Dreamscape Immersive, a company founded by Walter Parkes, an Oscar-nominated Hollywood producer and writer and the former head of DreamWorks Motion Pictures. It combines the emotional power of Hollywood storytelling, the technical achievement of virtual reality and the rigorous academic design for which ASU is known.

The Dreamscape Learn curriculum is in wide use at ASU, especially in the sciences. Now the university is taking the lead in bringing it to high school and middle school classrooms around Arizona.

"At ASU we take responsibility for the success of our students," says Michael M. Crow, ASU's president. "We have never blamed students for lack of achievement, we have only asked ourselves what we could do to help them learn better. We have an unbelievable tool now that is helping people to learn better, and we will not rest until we get it to as many students as possible."

The Pendergast district, led by Superintendent Jennifer Cruz, '96 BAE, '02 MEd, '14 EdD, was already deeply engaged in research about how to improve the middle school experience, when the district heard about Dreamscape Learn. They brought students, teachers, parents and school board members to Tempe to try it out.

"My team couldn't believe what a phenomenal experience it was," Cruz says. "They totally got the power of it."

Villa de Paz was the first school to get a custom-built virtual reality lab. Now, ASU-owned Dreamscape Learn mobile pods, built into towable trailers, are circulating in the Pendergast district so that all of Pendergast's 3,000 middle school students have an opportunity to participate.

Students attend class at a Dreamscape Learn Lab on ASU's Polytechnic campus in Mesa.

PRARTHAN PATEL/ASU

Milliah Pennington, one of the first Dreamscape Learn students at Villa de Paz, says the program connected her to her schoolwork in a way she hadn't felt before.

The excitement of taking action

The technology, design and storytelling allow Samuel and his fellow students to care about the inhabitants of this orbiting space zoo. Because the students are able to interact in the story, these middle schoolers are not just passively absorbing the wisdom of scientists who came before them. They are empowered to act as scientists themselves, using real-world biology to figure out how to help these make-believe creatures.

In one module, there is something wrong with the wise but aging leader of the megaraffes, named Xor. Xor is sick. In her disorientation, she has led her flock to a dangerous location. It is each student's job to determine what is wrong and try to save the entire society of megaraffes.

"The students actually feel like they're making a difference and actually taking ahold of their learning," says MacKenzie Skarlupka, '22 BS in biological sciences, and a seventh and eighth grade science teacher at Villa de Paz.

"We have an unbelievable tool now that is helping people to learn better, and we will not rest until we get it to as many students as possible."

— MICHAEL M. CROW, PRESIDENT, ASU

Benjamin Benton, also a seventh grader at Villa de Paz, says that he starts thinking about his sessions in the Dreamscape lab the night before he's scheduled to be there.

"It's like, oh my gosh, I'm so excited to go do this," he says. "When you wake up, you're so happy to go to science class."

Dreamscape has been in the Pendergast district just over a year, and leaders know many students feel similarly to Benjamin.

"We have seen an extraordinary increase in attendance on days when students are going to be working on Dreamscape," says Cruz.

At ASU, researchers have been monitoring the university's implementation of Dreamscape Learn. They are seeing significant improvements in educational outcomes of the students studying in the Dreamscape-enabled classes compared with students studying the same material in a more traditional way. Those improvements are holding across demographic groups and across socioeconomic groups. And the Dreamscape pedagogy is

SAMANTHA CHOW/ASU

Dreamscape Learn mobile pods circulate to all 12 schools in the Pendergast district, ensuring students have access to the VR-enabled curriculum.

allowing students to perform well regardless of their educational background.

Those researchers are now beginning to conduct rigorous analyses of the program in Pendergast's schools.

An emotional connection to learning

Milliah Pennington was in the first cohort of middle school students to try out Dreamscape Learn.

Kelsie Pennington, '01 BA in education and Milliah's mom, doesn't remember if she heard about it on the first day Milliah tried Dreamscape. But she's confident it was no later than the second day.

On their 45-minute drive home from school, Pennington asked that all-too-familiar question: How was your day?

"It was the most I'd heard about school," says Pennington, about Milliah's response.

Pennington, herself an educator, was used to hearing from Milliah about something that had happened at lunch, or maybe a project Milliah was working on in art class.

"You don't necessarily, typically, hear about the academics first," she says. "And so that was one of the things that stuck with me that day."

Milliah was in her final year at Villa de Paz and remembers being blown away when she put on her headset — not just by the technology, but by the narrative.

"I think we definitely had an emotional attachment to the story," she says.

Cruz sees that emotional connection as crucial to serving students.

"If we can give them really compelling work, like all of us, they'll do it," she says. "So we're super excited about that promise and this opportunity."

Students typically have a few days of in-class learning before each session in virtual reality. It is those lessons that can be modified by grade level. What middle school students do to prepare for their visits to VR learning is different from what college students do.

"The VR stories were meant to be evergreen, not necessarily audience-specific, and so that translates well across ages," says John VandenBrooks, associate dean for immersive learning at ASU.

And those stories follow the three-act template that will be familiar to anyone who has watched a Hollywood movie: the setup, the conflict or problem to be solved, and then the resolution. Mimicking that structure is by design — it's a proven way to connect with an audience, and it can be applied to teaching and learning.

"They're growing a connection to the scientific concepts at a deeper understanding than if I just gave a worksheet or an assignment online," says Skarlupka. "They actually want to talk about what they have learned. … They will even talk about it at recess, which is bizarre to me, because my kids don't usually talk about academics at recess."

This has turned out to be what Dreamscape's leaders believe makes the difference: If you can get students to feel connected to the material, they can learn anything.

"They're still kids and it's not that hard to get them excited about something cool — if it's cool," says Josh Reibel, the CEO of Dreamscape Learn and a former high school English and philosophy teacher. "We are taking them to amazing places and putting them in the context of really emotionally compelling stories where there is real drama and twists and turns and surprises. And you hook them."

In one story, the twist at the end involved the death of Xor, the leader of the megaraffes who had gotten her herd off course. It packed an emotional punch for the students.

"We had a lot of sobbing," says Skarlupka. "And because they care, they're actually learning more." ■

Explore Dreamscape Learn for yourself. Schedule a demo at Creativity Commons on the Tempe campus, located at 501 E. Orange St., or learn more at dreamscapelearn.asu.edu.

DECODING NATURE

Harnessing silkworm silk for medical innovation

Researchers at ASU successfully developed a new kind of sealant that can close wounds in seconds and reduce the risk of infection.

The team, led by Professors Jeff Yarger in the School of Molecular Sciences and Kaushal Rege in the School for Engineering of Matter, Transport and Energy, pioneered the use of silk fibroin — the core protein of silkworm silk — as a matrix for a new type of surgical adhesive.

When an incision is coated with this sealant and exposed to a near-infrared laser, the heat causes the silk to seal the tissue instantly.

By avoiding the trauma associated with needles, staples and sutures, and using the sealant as a vehicle for antibiotics, this method prevents the spread of infection and promotes faster recovery.

Learn more at sms.asu.edu.

Researchers, like Jeff Yarger, are studying the wound-healing abilities of spider silk.

DEANNA DENT/ASU

“I want people to get excited about the idea of healthy food and to hear new and interesting ideas they haven’t heard before.”

— KATHLEEN MERRIGAN, EXECUTIVE DIRECTOR OF THE SWETTE CENTER FOR SUSTAINABLE FOOD SYSTEMS

Attendees also sampled dishes made with local ingredients.

SMART NUTRITION

Cultivating healthier lives

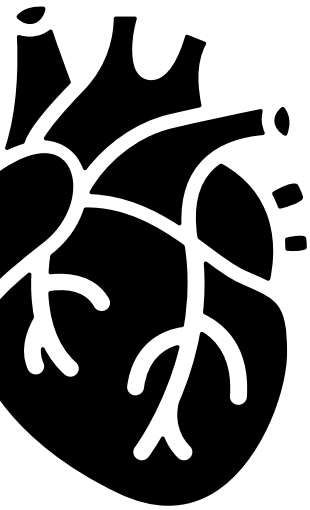
Over 600 million people worldwide go to bed hungry every night. That’s why ASU faculty and students, Indigenous leaders, farmers and other community members gathered at the Rob and Melani Walton Center for Planetary Health in Tempe last fall to share community-driven solutions to challenges in food production and global access to nutritious meals.

Ideas presented during the public showcase included helping farmers revive a West African superfood grain and earn more by managing the entire production process, investing in organic farming and using advanced medical tools to study how food affects human health.

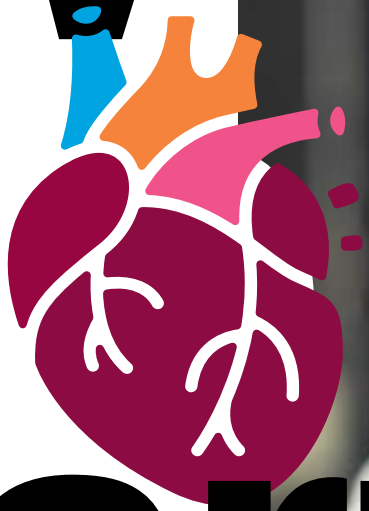
Learn more at globalfutures.asu.edu/food.

QUINTON KENDALL/ASU

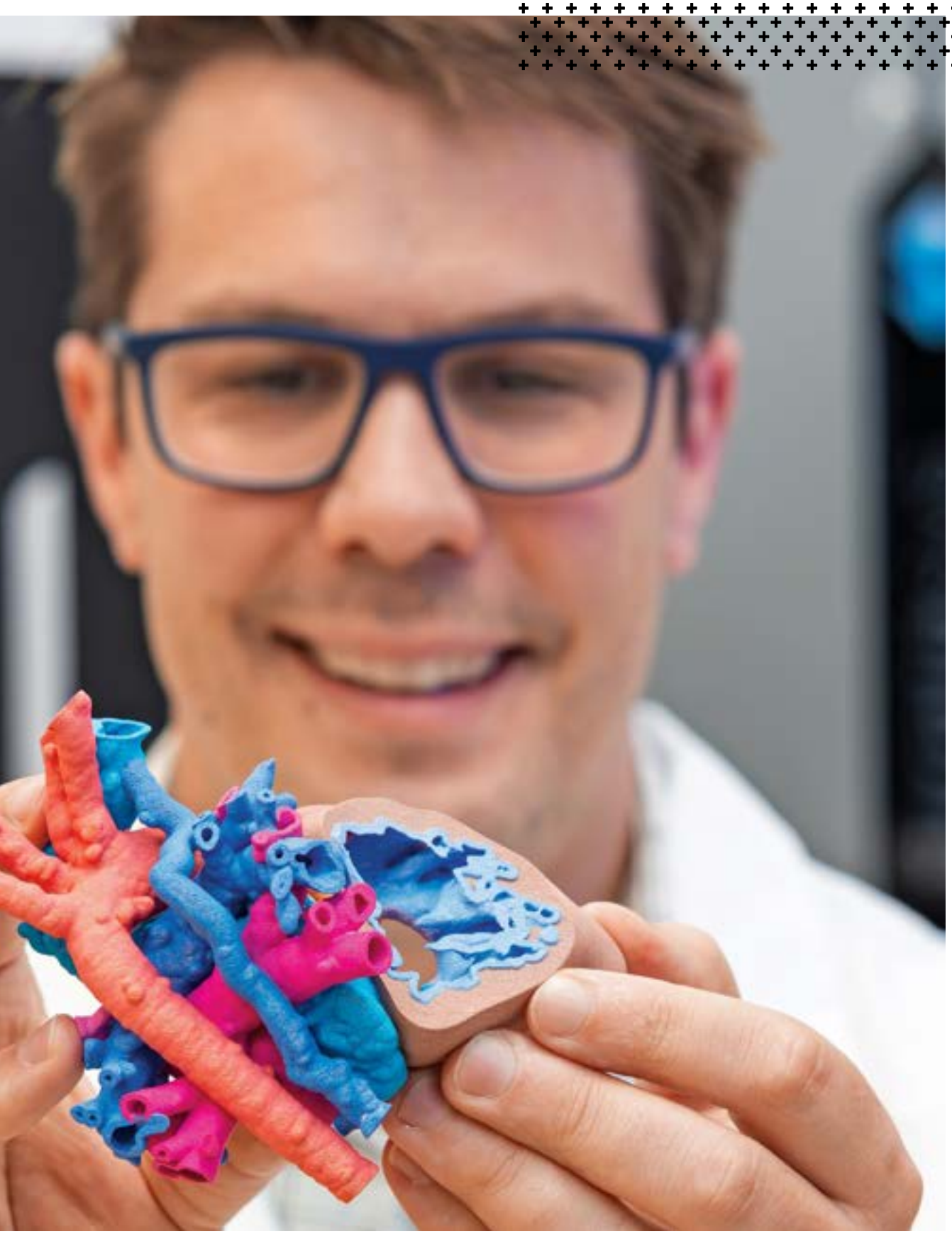
A new heart



A nationwide breakthrough for surgeons using 3D hearts



Story by DANIEL OBERHAUS, ’15 BA
Photos by SABIRA MADADY



Each year,

around 1.3 million children are born with congenital heart disorders, malformations that can include missing chambers or misplaced vessels. It's the most common birth defect globally, and about one-third of cases require surgery, often just weeks after birth.

The structural defects vary widely. Often, surgeons must rely on 2D images of a heart the size of a walnut from CT scans.

As one of the largest pediatric heart centers in the U.S., Phoenix Children's Hospital performs dozens of surgeries for congenital heart disorders every year. In 2012, it launched the Cardiac 3D Print Lab, a pioneering initiative with ASU that used 3D-printed models of patients' hearts to guide complex pediatric heart surgeries.

ASU alum Justin Ryan uses a 3D heart innovation from ASU to save lives at Rady Children's Hospital in San Diego.

Holding the heart

In 2009, Justin Ryan, an intermedia student at ASU learning 3D modeling and animation in what was then called the Katherine K. Herberger College of Fine Arts, attended a guest lecture by David Frakes, a professor in the Ira A. Fulton Schools of Engineering, and his career changed course.

"He needed someone to do 3D modeling, printing and casting," says Ryan, who now leads the 3D Innovations Lab at Rady Children's Hospital in San Diego.

Ryan, '10 BA, '14 MS, '15 PhD, worked in Frakes' lab while at ASU. In 2010, Frakes, Ryan and a small group of collaborators at ASU recognized they could deliver 3D prints directly to surgeons.

"We could give the surgeon the opportunity to quite literally hold a patient's heart in their hand before operating," Ryan says.

The basic idea was to transform images of a patient's heart taken from CT scans into 3D models that could then be printed in plastic using commercially available 3D printers. These color-coded models would help surgeons quickly understand the patient's specific structural defects and plan their operations accordingly.

By 2012, Ryan and his colleagues at the Fulton Schools had secured a grant for a 3D printer at Phoenix Children's.

Today there are 100 3D printing centers around the U.S. based on the pioneering research at ASU.

A retrospective study published by Ryan in the journal 3D Printing in Medicine showed that the models had a meaningful impact on reducing the amount of time the patient spent in surgery. To date, more than 500 heart models have been created at Phoenix Children's.

"If you can do a surgery faster, it reduces anesthesia time and risk," Ryan says. The faster surgeries were attributed to better surgeon preparedness, which itself reduces the chance of complications and improves the likelihood of good patient outcomes.

When Ryan and his colleagues launched their 3D printing initiative in 2010, you could count the number of 3D print labs in U.S. hospitals on one hand. Today, there are more than 100 3D printing centers at hospitals around the U.S. as research pioneered at ASU has become standard practice.

"We could give the surgeon the opportunity to quite literally hold a patient's heart in their hand before operating."

– JUSTIN RYAN, '10 BA, '14 MS, '15 PHD IN BIOENGINEERING

Growing new tissue

While Ryan's models help surgeons see damaged hearts, Mehdi Nikkhah is working to repair heart tissue itself.

Nikkhah, a professor in the School of Biological and Health Systems Engineering, has spent more than a decade on cardiac regeneration and disease modeling. His goal is to create engineered heart tissues in the lab that can be transplanted to repair damage from heart attacks.

"Myocardial infarction – a heart attack – is one of the leading causes of death nationwide," Nikkhah says. "For severe cases, the expected survival is often limited to only a few years, as they go through catastrophic heart failure."

Nikkhah's lab is attacking this problem from two directions. First, he's growing replacement tissue. His team combines stem cells with gold nanoparticles in a gel to create engineered heart tissues or patches that beat in the lab. The gold nanoparticles make the tissue electrically conductive, allowing cells to contract together like healthy heart muscle does. The goal is to transplant these patches onto damaged hearts, replacing scar myocardium with functional tissue that can pump blood.

The work has earned support from the Arizona Biomedical Research Commission, Phoenix Children's and most recently, a major NIH grant with Dr. Wuqiang Zhu at Mayo Clinic of Arizona.

"The collaboration is moving toward animal trials that can pave the way for preclinical studies," Nikkhah says.

Meanwhile, his heart-on-a-chip technology uses microfluidic devices the size of only a few millimeters to model cardiovascular disease. These chips contain human stem cells embedded in three-dimensional hydrogels or the same conductive materials used in the transplantable patches, creating miniature hearts.

Nikkhah can simulate a heart attack on the chip, then test whether his engineered tissues can repair the damage. If a treatment works on the chip, it's worth pursuing.

"This microengineering platform enables us to recapitulate the disease and interrogate its mechanism in the lab," Nikkhah says. "Then we can potentially do drug screening, and we can come up with better therapeutics for treatment of heart disease in the future."

Predicting heart problems

In the School of Computing and Augmented Intelligence, Associate Research Professor Ayan Banerjee and Professor Sandeep Gupta are developing digital tools to predict and prevent heart disease before damage occurs, especially in women.

When doctors analyze exercise stress electrocardiograms, they look for specific markers for evidence of heart disease. But in women, hormonal changes and other physiological factors create a baseline depression in the ST segment, one of the key markers doctors use to identify coronary artery disease. Women's ECGs can look abnormal even when they're healthy, leading to false positives and unnecessary invasive testing. Or sometimes, real problems get missed.

"Hopefully, in the near future, with the advent of these technologies, we can bring safer and more efficient therapies to the patients."

– MEHDI NIKKHAH, PROFESSOR IN THE SCHOOL OF BIOLOGICAL AND HEALTH SYSTEMS ENGINEERING

It's a big problem. Cardiovascular disease affects more women than all forms of cancer combined, causing one in three deaths each year. Yet the disparities in testing accuracy mean that although women are less likely to suffer from heart disease than men, they are far more likely to die from it.

Banerjee and Gupta, who lead ASU's Intelligent Mobile and Pervasive Applications and Communication Technologies Lab, are tackling this with a hybrid approach to artificial intelligence. The team received multiple grants from the Arizona New Economy Initiative, the Mayo Clinic Cardiovascular Research Award and, more recently, the National Institutes of Health, to work with

Shaun Wooten, '17 BS and BSE, left, is a PhD student working in Mehdi Nikkhah's laboratory. The heart-on-a-chip technology, below, uses microfluidic devices the size of only a few millimeters to model cardiovascular disease.

collaborators at Mayo Clinic. They conducted a study of more than 1,200 patients who had undergone both exercise stress ECGs and coronary angiography. Rather than simply feeding data into a neural network, their approach combines patient data with decades of medical expertise about how the heart works and what doctors look for in ECG readings.

"The innovation was to not just utilize the data but also experts' knowledge at various stages of model development and validation," Gupta says.

The results from the Mayo Clinic study were striking. When tested on 227 patients not included in the training data, the AI achieved 94% accuracy in detecting severe coronary artery disease. More importantly, it eliminated the gender gap. The system improved sensitivity from 50% to 91% in women and from 50% to 94% in men. For the first time, the test worked equally well for both sexes.

"What we could do with AI is level the playing field," Banerjee says.

Importantly, the AI can explain its reasoning in terms doctors understand, showing which features led to a diagnosis.

"Our main idea is not just use AI as a data-churning machine, but integrate the human experts' knowledge into AI," Banerjee says.

Monitoring for life

In addition to using AI for improved ECG analysis, Banerjee and Gupta are working on building digital twins of patients' hearts.

These mathematical models capture the unique electrical and mechanical properties of a patient's heart, which Gupta hopes will one day allow physicians to detect problems long before they become life-threatening.

"Heart attacks occur very infrequently, but when they occur, they are life-threatening," Banerjee says.

To catch them before they happen may require around-the-clock monitoring that provides a complete picture of how a person's heart changes over time.

The challenge with lifelong monitoring is too much data. That's where the digital twin comes in. The team's approach uses physiological models based on decades of cardiac research.

"A year or two years' worth of data can be only stored using 15 parameters," Banerjee says, "instead of millions of data points."

Hearts change slowly over a lifetime. When significant changes occur, the system detects them and adjusts the digital twin model.

Learn more about research that matters at news.asu.edu/research-matters.

The digital twin can help doctors understand what's happening with a specific patient's heart. The team is working on techniques to run these models on portable devices, making continuous monitoring practical. The digital twin tools are now in pilot studies at Mayo Clinic.

"Our goal is to basically eliminate deaths from heart failure," Gupta says.

But collecting real-world data still plays an important role in prevention. For years, Dorothy Sears, a professor in the College of Health Solutions, has studied how sedentary behavior damages cardiovascular health and how behavioral interventions can reduce the risk of cardiovascular problems. In one study, Sears used data from wearable sensors worn by 518 postmenopausal women who were overweight and discovered that their sitting behavior was associated with levels of blood sugar and fats linked to heart disease risk. Data from a more recent study on postmenopausal women highlighted a simple solution to improving their cardiovascular health.

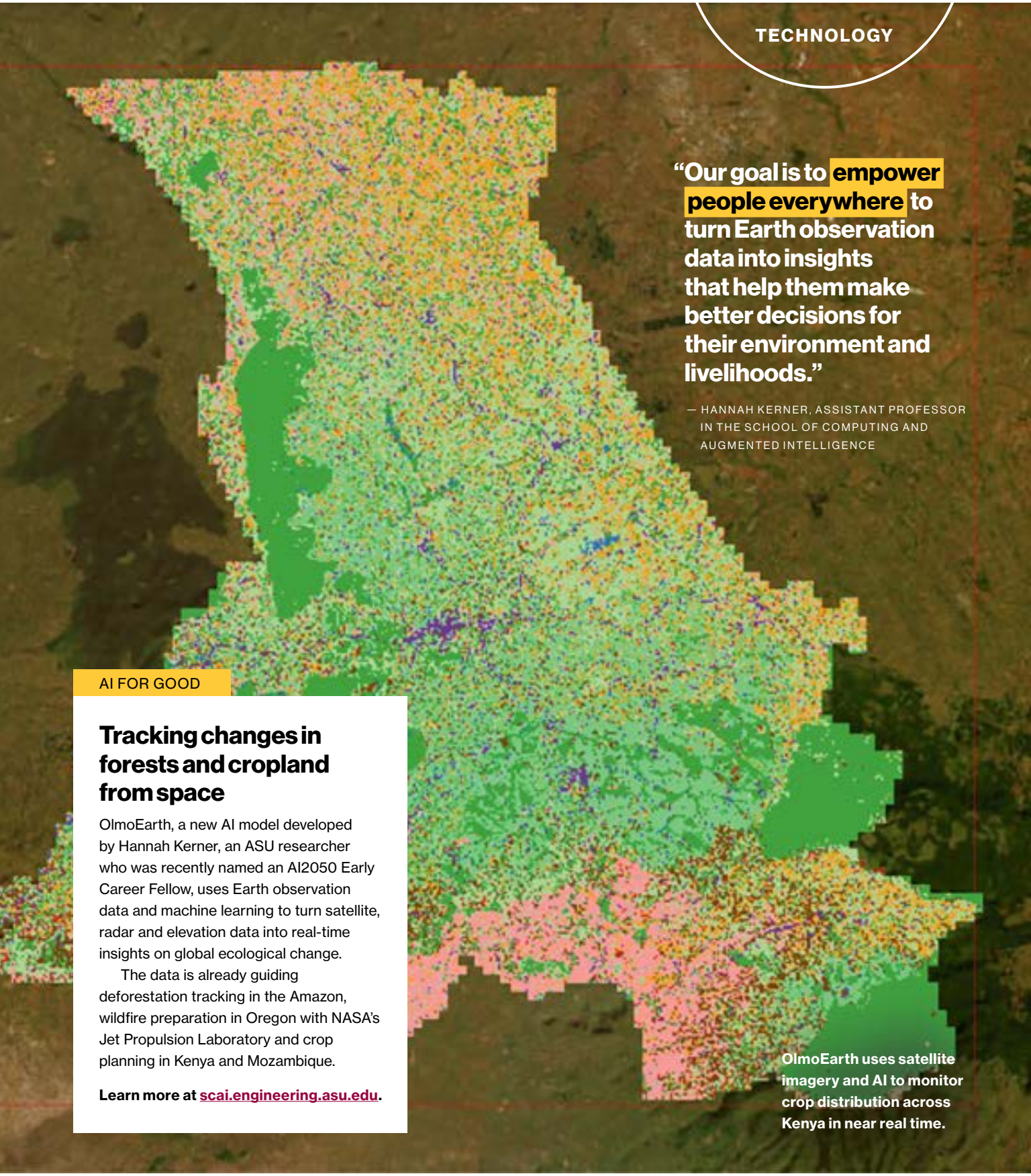
"We showed that just breaking up sitting time with an eight-minute break once an hour improved vascular function in a single day."

– DOROTHY SEARS, PROFESSOR IN THE COLLEGE OF HEALTH SOLUTIONS

"We showed that just breaking up sitting time with an eight-minute break once an hour improved vascular function in a single day," Sears says. "Our evidence is showing that any way that you can break up your sitting time or maybe just walk around or stand up will benefit your blood vessels."

A coordinated effort

ASU researchers are working at every stage of heart care. None of these innovations happened in isolation. Each breakthrough required collaboration across disciplines, among universities and hospitals, and researchers who understood that solving heart disease means addressing it from the operating room to the research lab. ■



“Our goal is to empower people everywhere to turn Earth observation data into insights that help them make better decisions for their environment and livelihoods.”

— HANNAH KERNER, ASSISTANT PROFESSOR IN THE SCHOOL OF COMPUTING AND AUGMENTED INTELLIGENCE

AI FOR GOOD

Tracking changes in forests and cropland from space

OlmoEarth, a new AI model developed by Hannah Kerner, an ASU researcher who was recently named an AI2050 Early Career Fellow, uses Earth observation data and machine learning to turn satellite, radar and elevation data into real-time insights on global ecological change.

The data is already guiding deforestation tracking in the Amazon, wildfire preparation in Oregon with NASA’s Jet Propulsion Laboratory and crop planning in Kenya and Mozambique.

Learn more at scai.engineering.asu.edu.

OlmoEarth uses satellite imagery and AI to monitor crop distribution across Kenya in near real time.

COURTESY OF OLMOEARTH

How AI is changing college

Here's how ASU is investing in artificial intelligence, from upskilling to student tutors

Story by
HELEN RUMMEL OF THE ARIZONA REPUBLIC

Reprinted with permission from The Arizona Republic; edited for length

Artificial intelligence is the "great equalizer," in the words of ASU President Michael Crow.

It's compelled industries, including higher education, to adapt quickly to keep pace with its rapid advancement. Over the last several years, ASU has launched a range of initiatives to prepare students for an AI economy, using new tools, research and credentials designed to keep those already in the workforce up to date with the job market.

ASU has contributed hundreds of millions of dollars in that work, largely from research grants. That money supports studies on medicine, education and sustainability among other topics.

In addition, ASU began a flagship partnership with OpenAI early last year. Since then, the university has supported more than 500 AI projects proposed by faculty and students.

ASU brings AI closer to students

This fall, university officials announced that every ASU student, faculty and staff member would have access to OpenAI's ChatGPT Edu with GPT-5. ASU Chief Information Officer Lev Gonick describes the effort as "democratizing innovation." Free licenses became available at the start of October. The university's partnership ensures the data shared with ChatGPT is private and is not used for training the AI system.

Some of the university's past endeavors include a "Language Buddy" which allows students to practice speaking a second or third language with an AI assistant. Another allows health sciences students to interact with an AI model that mimics real patient interactions.

Anne Jones, an ASU professor and vice provost for undergraduate education, says the university's goal is to create "master learners," and AI pushes that mission forward.

"It makes it possible for us to make education more accessible to anyone qualified," Jones says of ASU's AI expansion. "We're going to use it."

Jones says the university is constantly looking for ways to bring other faculty and students into the push forward. That includes dozens of seminars, guides and an AI Playground that walks users through everything from chatbots to AI research tools.

"AI can make the sum of human knowledge available to everyone. It has taken us hundreds and hundreds of years to get to that point. And then we get this new technology that will allow us to accelerate all of this."

— MICHAEL M. CROW, ASU PRESIDENT AT AN ASU AI EVENT

Is AI use sustainable?

Serious questions remain on how the mass implementation of AI will impact our everyday lives. Many scholars, including several at ASU, have questioned how the use of AI is sustainable given its often overwhelming energy needs. Kyle Bowen, deputy chief information officer for ASU's Enterprise Technology, says ASU is having those discussions in its labs as well.

One way the university is looking at ways to make AI more sustainable is by

providing tools people can use to compare the exact energy and costs associated with their AI use.

"You can pick the most efficient choice and have kind of transparency around, 'This is what the differences between the models are looking at to what that trade-off between cost and quality is,'" Bowen says.

The university is also researching ways AI can function more efficiently with hopes of tamping down energy use over time.

What is AI upskilling?

As more companies move to cut costs and embrace AI, a competitive job market has stoked long-standing fears that AI could begin taking jobs once done by humans.

Around 40% of employers are expected to downsize their workforce in cases where work can be automated, according to a 2025 report from the World Economic Forum. Some of the most vulnerable jobs center around data entry, scheduling and customer service, according to Forbes.

In response, ASU has launched a portfolio of programs to help people in vulnerable sectors gain new AI skills desired in a modern workforce. The courses touch on AI use in leadership, finance, health care, education, sustainability and several more. They start at $49.

It's a topic Crow and other leaders have confronted head-on. At a roundtable discussion with several technology leaders and Democratic Sen. Mark Kelly this fall, Crow spoke at length about the university's responsibility to ensure their students were prepared to take on a slew of jobs that don't yet exist.

"It's up to the education institutions like ours to stop being innovation laggards and find ways to embrace these technological opportunities," Crow says. "Because it may be that those companies can't think about that while they're building all these kinds of things, but we can." ■

Watch ASU President Crow on Bloomberg

In an interview, ASU President Michael M. Crow told the news outlet, "Artificial intelligence is reshaping higher education — from the way teachers assess work to how universities prepare graduates for jobs that don't yet exist." He calls AI a "hyperspeed calculator" that forces schools to raise the bar.

Learn about AI at ASU at ai.asu.edu.

Watch the full interview.

GOLDEN HOUR

New views across Tempe

Looking west from the Walton Center for Planetary Health reveals the heart of STEM learning and research on the Tempe campus, including ISTB2, ISTB5, the Goldwater Center for Science and Engineering, the Engineering Research Center and the Bateman Physical Sciences Center. In addition to reflecting Tempe's reputation as a hub for education and research, the view offers a compelling snapshot of the city's growth.

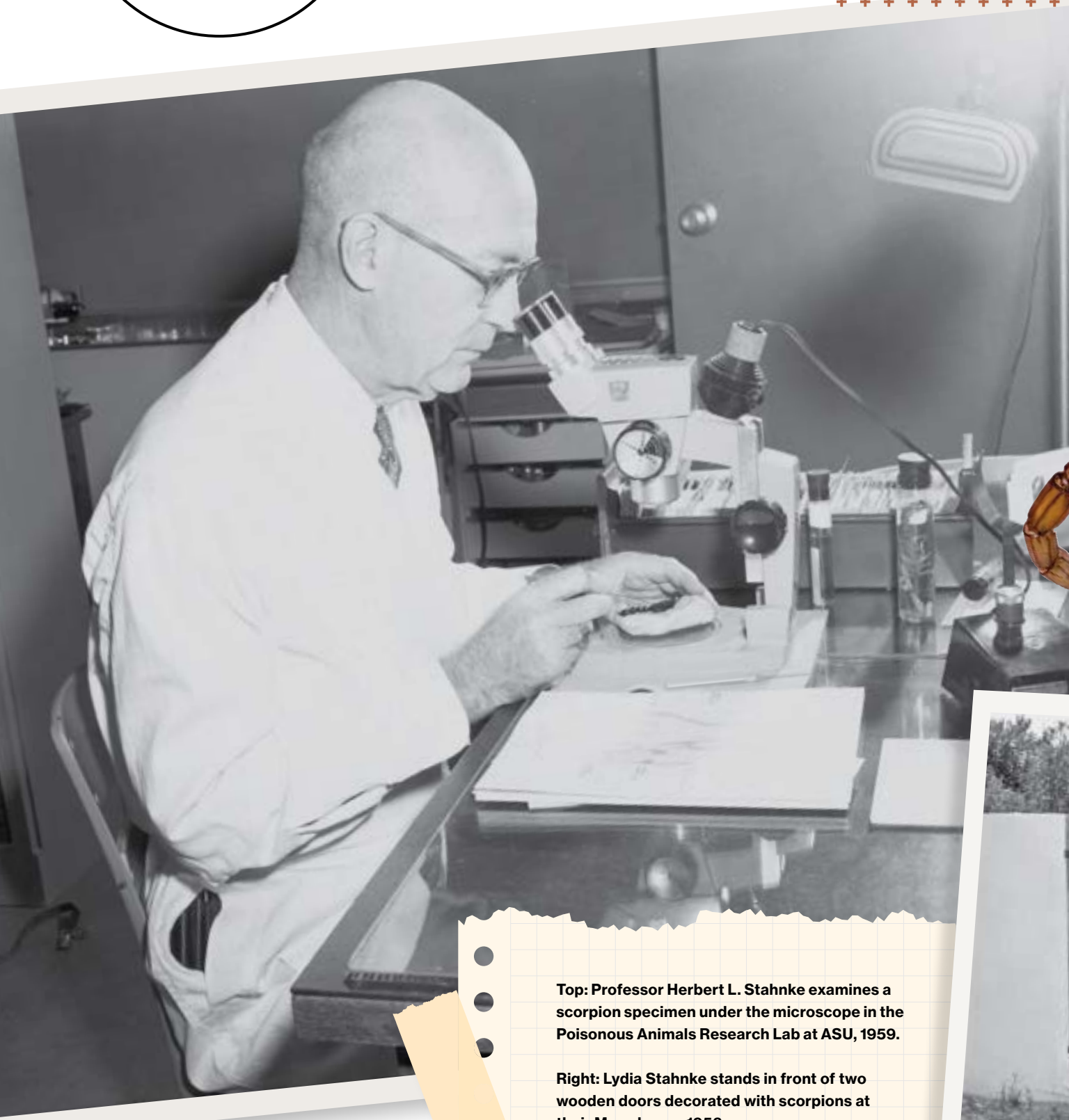
With 55,000-plus students enrolled at the Tempe campus alone as of fall 2025, the city is expanding its services to meet the needs of its student population — part of a university system that now serves more than 194,000 students.

Take a walk around campus to experience how it continues to transform.

Schedule a tour at visit.asu.edu.

The Tempe campus, ASU's original home, has grown exponentially over the last 140 years.

DAVID JINKS/ASU



Top: Professor Herbert L. Stahnke examines a scorpion specimen under the microscope in the Poisonous Animals Research Lab at ASU, 1959.

Right: Lydia Stahnke stands in front of two wooden doors decorated with scorpions at their Mesa home, 1956.

Creepy-crawly science that matters

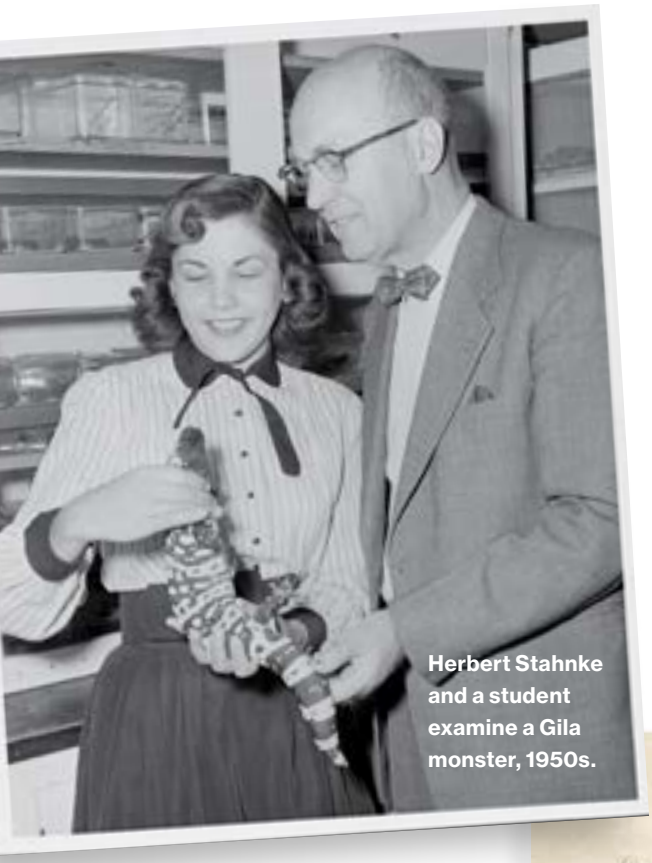
How an ASU researcher developed lifesaving antivenom against scorpions

Story by DOUGLAS C. TOWNE
Photos by ASU ARCHIVES

When Karen Clark was a child traveling with her grandfather, the late ASU Professor Herbert L. Stahnke, she didn't realize how unusual their evening routines were.

"When we arrived at our destination, we always hunted outside for scorpions that glowed under our black light," says the retired nurse. "It wasn't until later that I learned that normal people didn't do that. But scorpions were my grandfather's passion."

Clark also recalls watching him extract venom from the stingers of these nocturnal arachnids at the exotic-sounding Poisonous Animals Research Laboratory, which he founded at ASU in 1945. As the lab's name suggests, scientists studied more than just scorpions there.



Herbert Stahnke and a student examine a Gila monster, 1950s.

Two things were constant across the research.

"My grandfather had a great sense of humor and instilled in our family the importance of education and science," Clark says.

Stahnke, who at the time was the nation's leading authority on scorpions, had big ambitions at the lab, where research also focused on black widow spiders, centipedes, tarantulas and Gila monsters. He dedicated years to developing an antivenom for infants who experienced life-threatening reactions to scorpion stings, the kind of revolutionary discovery that continues today at ASU.

Crowdsourcing a cure

Stahnke achieved his objective with the help of the Valley community, which supported him in one of the most unusual crowdsourcing medical campaigns in history.

He needed hundreds of specimens for his scorpion research. As early as the mid-1930s, Stahnke called on the public to bring him specimens so he could identify different species and collect their venom. In 1951, his appeals for scorpions to produce antivenom went viral. Life magazine covered his outreach, calling it a "scorpion roundup." Stahnke needed about 150 scorpions to produce a single dose of antivenom, so the publicity was welcome.

"Several kids, including myself, in our Tempe neighborhood collected scorpions for him," says John Gwilliam, a retired plumber. "He paid us 5 to 25 cents apiece for them, depending on the species."

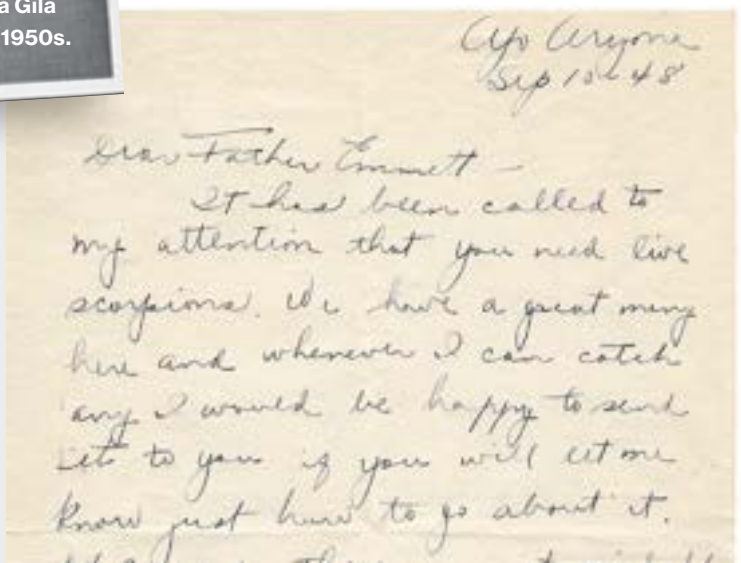
According to ASU Archivist Shannon Walker, there were many drop-off locations around the city.

"As he involved the public, each person who participated became what we would call today a 'citizen scientist.' In a way, it became a clever marketing campaign raising awareness of the lab and its research and allowing citizens to participate," she says.

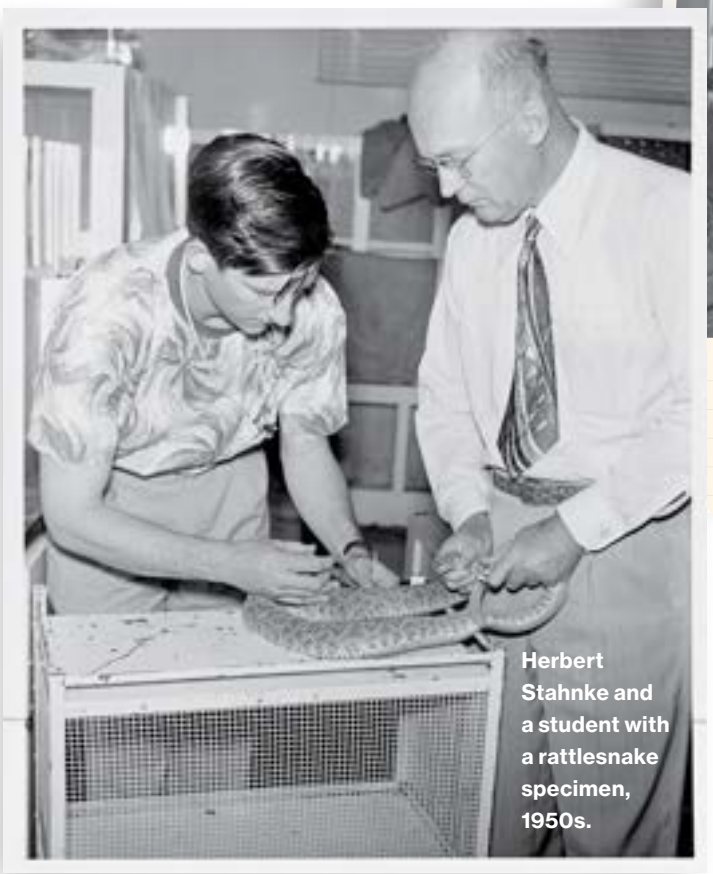
Handling dangerous desert creatures seemed like an unusual career choice for an urban kid who grew up in Chicago. Stahnke loved biology, though, and after graduating from The University of

"Several kids, including myself, in our Tempe neighborhood collected scorpions for him."

— JOHN GWILLIAM, RETIRED PLUMBER



Left: A letter describing plans to send live scorpions to ASU's Poisonous Animals Research Lab, 1948.



Herbert Stahnke and a student with a rattlesnake specimen, 1950s.

Herbert Stahnke teaching a class, while Dean McGrath of the College of Education observes, 1957.

Chicago in 1928, he followed his fiancée, Lydia Stille, to Arizona, where he taught science at Mesa High School.

Stahnke's PhD dissertation, "The Scorpions of Arizona," was inspired by a child in Mesa who died from a scorpion sting. Two years later, he became the first head of the Department of Biological Sciences at Arizona State College, the predecessor to ASU.

In a 1943 article in Popular Science magazine, Stahnke points out that scorpions' stings had killed twice as many people in Arizona as all other venomous creatures combined over the past 20 years. He also discovered that treating patients with morphine for pain relief — standard practice at the time — made the venom more toxic.

Saving lives

To fill the need and literally save lives, Stahnke founded ASU's Poisonous Animals Research Laboratory in 1945. It transformed how Arizonans interact with their natural habitat even today, according to Walker.

"One of the most important aspects of Stahnke's legacy is the way he used education and science to dispel myths and superstitions about scorpions and other venomous creatures," Walker says. "Instead, he promoted curiosity and knowledge of their behavior and habits for proper avoidance."

The charismatic ASU professor became a scientific celebrity through his writing and lecturing, which included a six-month speaking tour of Europe in 1961. Stahnke also hosted his own TV show, "Desert Denizens," which aired locally from 1953 to 1957.

Rosalind Hussong recalls attending a presentation by Stahnke. "He emphasized respecting the snakes and their vital role in maintaining the ecosystem balance," says the retired California medical professional. "People were drawn to him, and he patiently answered question after question. He was an environmentalist before the term became popular."

By 1948, Stahnke had developed a scorpion antivenom that was credited with saving many young lives, including that of Neil Wheeler, '75 BA in anthropology, in 1951.

"I was stung by a bark scorpion at the age of 6 months and was in convulsions with a 106-degree fever at Good Sam Hospital," says the retired teacher who lives in central Arizona. "The doctors told my mother it was unlikely I'd survive."

Miraculously, a hospital intern who had studied under Stahnke called him at his ASU office, and Stahnke personally delivered the antivenom.

Herbert Stahnke and an associate being filmed as part of the lab's efforts to enhance public education, 1959.

"Twenty years later, as a student at ASU, I looked Dr. Stahnke up to thank him," Wheeler says.

A legacy that endured

Stahnke retired from ASU in 1972, having earned numerous research grants and published 23 books and 96 academic articles. He passed away in 1990, but former ASU students still vividly remember his classes, including Athia Hardt, who enrolled in one in 1969.

"Stahnke was an interesting guy, very confident in his theories, and was a famous figure on campus," says Hardt, who served as press secretary for Govs. Bruce Babbitt and Rose Mofford.

Stahnke's influence may have even reached Hollywood in "The Fabelmans," a 2022 semi-autobiographical film directed by Steven Spielberg.

"When the main character was young, he and some friends were seen collecting scorpions in the desert to raise money for film and supplies," Walker says. "Knowing that Mr. Spielberg lived in Phoenix for some time, I'd be willing to bet money that he was sending those specimens to Dr. Stahnke's lab."

"If there were a local 'Nobel' prize for venomous animal research, it should be named after him. My patients and I have benefited tremendously from his work."

— DR. FRANK LOVECCHIO, MEDICAL DIRECTOR OF CLINICAL RESEARCH AT ASU'S COLLEGE OF HEALTH SOLUTIONS

Truly revolutionary science that mattered

The importance of Stahnke's antivenom cannot be understated.

"If there were a local 'Nobel' prize for venomous animal research, it should be named after him," says Dr. Frank LoVecchio, medical director of clinical research at ASU's College of Health Solutions, who served on the faculty of Banner Poison and Drug Information Center from 1996 to 2020. "My patients and I have benefited tremendously from his work."

LoVecchio says that if a toddler required a hospital admission after a scorpion sting, they would often sedate the child and sometimes put them into a medically induced coma. The other option was Stahnke's antivenom.

"Patients would often reverse within an hour and return to baseline shortly after administration," he says. "The antivenom saved lives, lowered medical costs and reduced unnecessary hospital stays and suffering for patients and their families."

Stahnke's lab closed in 1988 after successfully advancing medical treatments for bites or stings. Its antivenom was still given out until supplies were depleted around 2004, according to LoVecchio.

Today, scorpion antivenom developed by a private company is used to treat stings — unfortunately, LoVecchio says, at a higher cost.

Lifesaving research continues at ASU

Research in ASU's School of Life Sciences involving these often-mysterious animals still moves forward; a team recently sequenced the entire genome of a Gila monster. Its DNA code reveals incredible chromosome diversity and provides insights into the reptile's evolution. The data could help treat Type 2 diabetes in humans.

Although unrelated to Stahnke's research, ASU is still making pioneering discoveries that have vital implications. ■

Learn more at sols.asu.edu.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EXCITEMENT

Molly Miller's basketball era off to a great start

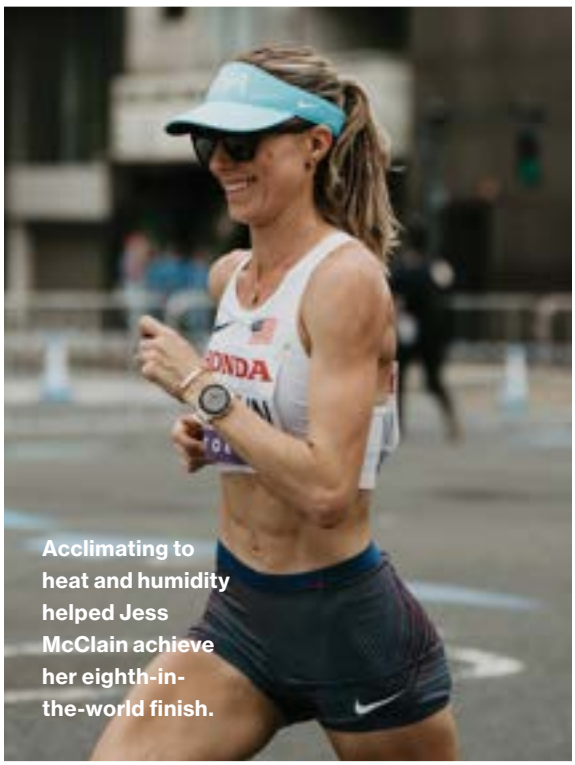
It hasn't taken long for Sun Devil Women's Basketball Head Coach Molly Miller to make history at ASU. By the team's third game of the year, an impressive Sun Devil 79-47 win at San Diego, Miller collected her 300th win as an NCAA head coach. At the same time, her squad tied a 2008 school record for three-pointers with 14, showcasing the electric momentum that's surrounding the program. With such a great start, fans are buzzing about what's ahead.

Get tickets:
sundevils.com/tickets/womens-basketball

Center: Molly Miller coaching the team.

Sports

Turning up the heat



Acclimating to heat and humidity helped Jess McClain achieve her eighth-in-the-world finish.

LAUREN NEMEROFF/FLOW STATE CREATIVE

Marathon runner Jess McClain trains in simulated race-day conditions at ASU's Health Futures Center.

Acclimating to heat and humidity helped Jess McClain win eighth in the World Championships

Story by PETE ZRIOKA
Photos by BILLY HOLLANDER

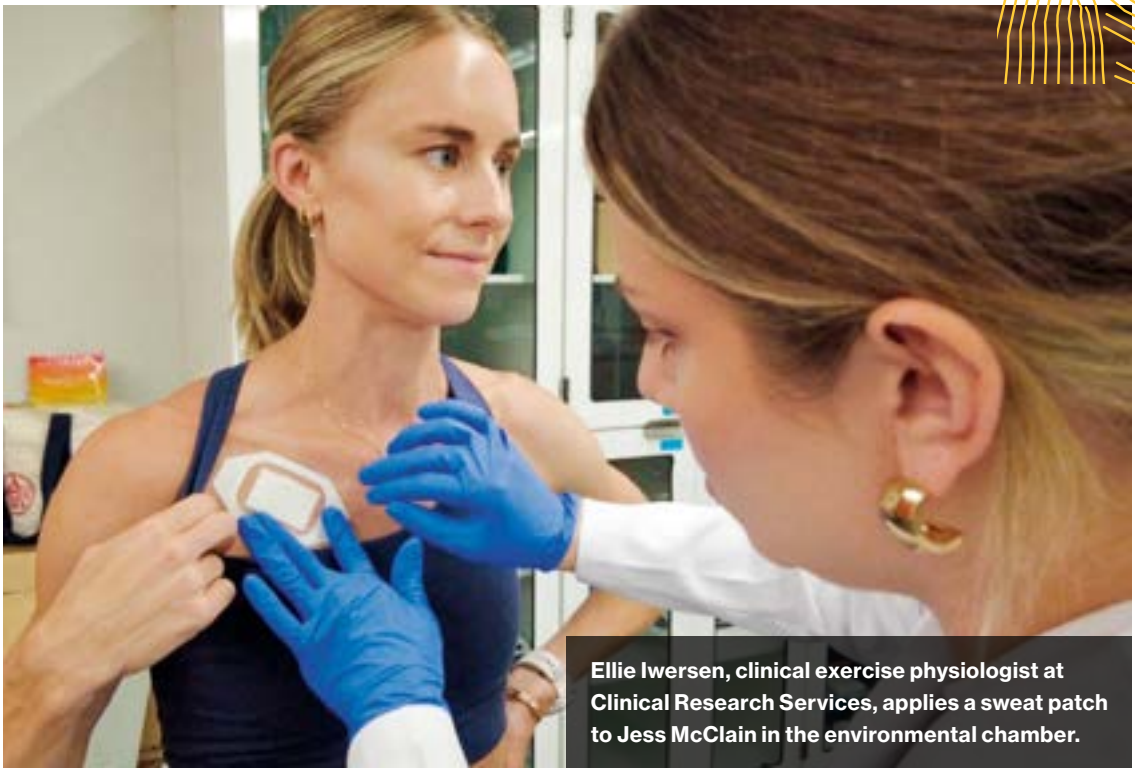
Any runner worth their salt will tell you: nothing new on race day.

That's why elite marathoner Jess McClain visited ASU's Core Research Facilities before securing an eighth-place finish at the 2025 World Athletics Championships women's marathon on Sept. 14 in Tokyo.

A Brooks-sponsored runner based in Phoenix, McClain is accustomed to desert heat but less familiar with the stifling humidity she faced in Tokyo. Race conditions were grueling: low-to-mid-80s temperatures combined with high humidity.

To prepare, McClain trained in ASU's Clinical Research Services' environmental chamber, where she acclimated to heat and humidity from Aug. 26 to Sept. 4.

"I do think the chamber helped on race day. Because I spent four sessions in the chamber and had six full days in Tokyo to adjust to the time change and conditions, I feel like the weather on race day wasn't something that affected me mentally," says McClain, who secured her top-10 finish with a time of two hours, 29 minutes and 20 seconds — a sub-six-minute-per-mile pace.



Ellie Iwersen, clinical exercise physiologist at Clinical Research Services, applies a sweat patch to Jess McClain in the environmental chamber.

"My 'A' goal was top five, but after the long trip home and a lot of reflection, I am super proud to come away as the eighth best female marathoner in the world in 2025," McClain says. "My Team USA teammate and I took the lead in the race pretty early on, which was not necessarily the plan going in, but it was really fun to lead a high-caliber marathon for the first time in my career. It definitely made me hungry for more, and the experience I gained competing on the world stage is invaluable."

"My 'A' goal was top five, but ... I am super proud to come away as the eighth best female marathoner in the world in 2025."

— ELITE MARATHONER JESS MCCLAIN

Ellie Iwersen, a clinical exercise physiologist at Clinical Research Services, says McClain trained on a treadmill under simulated race-day conditions. Over four sessions, staff progressively raised the chamber's temperature and humidity — from 86 degrees Fahrenheit and 60% relative humidity to 89.6 degrees and 80% relative humidity.

"We did progressive environmental acclimation, so we started a little bit lower and then built up each day, that way her body could take a moment to get used to it," Iwersen says.

The chamber, installed at the Health Futures Center in January, can replicate environments ranging from 39.2 to 109.4 degrees and 20% to 90% humidity.

The ASU staff also worked with Brooks Running principal physiology researcher Bridget Sopeña to conduct sweat testing. As McClain ran, staff collected sweat samples, which Brooks analyzed to measure sodium and electrolytes loss — data that informed her fueling strategy.

"We've had a lot of researchers use the chamber, but not to the degree that Jess did," says Veronica Martinez, Clinical Research Services director. "This goes to show what we can offer to athletes at this level."

Beyond athletic performance testing — such as VO2 max, cardiopulmonary exercise testing and resting metabolic rate — Clinical Research Services also provides imaging, phlebotomy, nutrition services and clinical spaces for human research. ■

For more information on Clinical Research Services and how to access the environmental chamber and other facilities, contact clinicalresearchservices@asu.edu or visit cores.research.asu.edu.

Bring your kids to basketball games

With new Sun Devil Women's Basketball Head Coach Molly Miller comes a new fan section, Molly's Minis. This section is dedicated to families with kids, and is located right next to the Sun Devil bench. It's a great place to scream, cheer and interact with the team.

See the schedule: **thesundevils.com/sports/womens-basketball/schedule.**

Desert Financial Arena renovations

Desert Financial Arena is about to get a brand-new look through a renovation of the arena with an estimated cost of $100 million. The project, with most work taking place from April to October, has an anticipated completion date of December 2029 and requires approval by the Arizona Board of Regents. It includes:

- New loge boxes
- Club-level seating and premium floor seats
- A new court
- New restrooms and the renovation of existing restrooms
- New and upgraded concession stand offerings
- A new video board

Sun Devil wrestler wins gold

If there's anyone who can appreciate what former ASU wrestler Zahid Valencia, '20 BA in interdisciplinary studies, accomplished by winning gold at the Senior World Championships in Zagreb, Croatia, last fall, it's Sun Devil Coach Zeke Jones. The only other ASU wrestler to win a world championship was Jones himself, in 1991. Valencia, 28, scored a perfect 49-0 across five matches against international opponents en route to a gold medal in the 86-kilogram (190 pounds) freestyle class.

MORTENSON/HUSSEY SEATING, TONY ROTUNDO/WRESTLERSAREWARRIORS.COM

"We're exploring joyful chaos, rough-and-tumble play, connection making and expression."

— AMANDA PINTORE, ASSISTANT PROFESSOR IN THE SCHOOL OF MUSIC, DANCE AND THEATRE

PLAY LABS

Dance sparks creative expression in kids

"Red" is a new family-friendly dance performance designed to engage toddlers in creative expression. For Amanda Pintore, an assistant professor in the School of Music, Dance and Theatre, the name made perfect sense. According to a study published in Frontiers in Human Neuroscience, it's an attention-grabbing color tied closely to emotion.

Through "play labs," she studied the actions of children, like jumping and spinning, and used them as inspiration to build the performance.

So far, nearly 500 children between 12 and 36 months and their caregivers have attended performances of "Red."

"This is a unique experience to introduce or increase love of music and dance [to kids]," says Angelica Parmenter, '15 MS in industrial engineering, whose 13-month-old and 4-year-old children participated in the program.

Visit musicdancetheatre.asu.edu to learn about future shows.

Amanda Pintore performs a creative dance with toddlers.

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