

# ASU

ARIZONA STATE UNIVERSITY  
Volume 29 Number 3

**Thrive**

How the  
Sun Devil 100  
are fueling  
growth

Nearly 50  
years of  
AI at ASU

# THE quantum frontier

Researchers and students are helping shape quantum computing, which could revolutionize health care, materials discovery, supply chains and more

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Arizona State  
University

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camera to  
view the  
digital edition.



# A global mindset, building what's next

Sun Devil alum Andrea Singer strengthens  
ASU's connections in London



**“However you engage, the goal is the same: Help empower and believe in the ASU ecosystem to build what’s next.”**

**Andrea Singer**

'13 BS in finance and Next Generation Council member

Andrea Singer has built her career with a global perspective – and she's helping extend the Arizona State University network across continents.

A graduate of the W. P. Carey School of Business, Singer now lives in London and works in global finance. Outside of work, she connects alumni and spotlights ASU's expanding presence in one of the world's leading business capitals, representing a new wave of leaders advancing the university far beyond Tempe.

As a member of the Next Generation Council, Singer works with fellow alumni volunteers to help strengthen engagement between ASU and its global community of graduates and donors. Together, they champion ASU's mission while creating new opportunities for Sun Devils to stay connected and involved. That mission resonates strongly in London, where ASU's presence continues to grow.

For Singer, the ASU network reveals itself in unexpected ways. A chance conversation at an airport, a conference or even on a remote mountainside can suddenly turn into a connection between Sun Devils – a reminder of just how far the university's community reaches.

Through Changing Futures, alumni and donors everywhere can help make a difference in the lives of others. **Join game changers like Andrea Singer in championing ASU's global impact and discover how you can help build what's next at [asuchangingfutures.org](https://asuchangingfutures.org).**



The new ASU London campus in Islington, Central London at City St. George is where innovation and ambition converge to deliver a world-class education that opens doors across the globe.

**ASU** Arizona State University

**Changing Futures**  
From Arizona. For the world.



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.

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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.

# Sun Devils leading the way

Each spring, tens of thousands of new Sun Devils cross the stage as graduates, launched into a future of new possibilities. These are master learners who have undergone the remarkable transformation that takes place here at ASU and who leave prepared to make their mark in the world. They do so at a time of widespread societal and economic disruption, a moment that brings extraordinary opportunity.

Entire new sectors – from artificial intelligence to quantum computing – are advancing at unprecedented speed. As ASU prepares students to enter these rapidly expanding new fields, the university also works with industry and other leaders to help shape these new frontiers of knowledge and discovery. Our researchers and learners are pioneering quantum technologies with the potential to transform fields such as health care, materials science, supply chain design and cybersecurity. In doing so, we are embracing AI – embedding it across every discipline to ensure that every graduate leaves here able to thrive in an AI-driven world.

These opportunities to shape tomorrow exist today. Armed not only with credentials but with knowledge and experience, ASU graduates are leading the way. Companies recognized in the Sun Devil 100 – all founded or led by our alumni – are driving growth, creating jobs and powering innovation across Arizona and around the nation.

The ASU Charter is at the heart of this success, a promise to measure ourselves not by whom we exclude, but by whom we include and how they succeed. Every discovery, every graduate, every partnership reaffirms that commitment. We are a community built to empower learners of every background to take part in solving the grand challenges of our time.

The future of work always bends toward change and we share agency in shaping it to serve the needs of society. ASU is actively engaged in this work every day. And through the collective creativity, determination and purpose of our graduates, we will continue to innovate and adapt – a university designed for the future.

**Michael M. Crow**

President, Arizona State University

[in michaelcrow](https://www.linkedin.com/in/michaelcrow) [fb michaelcrow](https://www.facebook.com/michaelcrow)

[ig asuprescrow](https://www.instagram.com/asuprescrow) [fb presidentcrow](https://www.facebook.com/presidentcrow)

# New American University

Toward 2031 and beyond

ASU is the prototype for the New American University, a public research university transforming higher education through its commitment to excellence, access and impact. Collectively, the ASU Charter, design aspirations and mission and goals serve as our framework, guiding everything we do.

Learn more at [asu.edu/about/charter-mission](https://asu.edu/about/charter-mission).



Learn how ASU is making education accessible to more people.

## ASU Charter

ASU is a comprehensive **public research university**, measured not by whom it excludes, but by **whom it includes** and **how they succeed**; advancing **research and discovery** of public value; and assuming **fundamental responsibility** for the economic, social, cultural and overall health of the **communities it serves**.

Nine **design aspirations** guide ASU's ongoing evolution as a **New American University**. ASU integrates these institutional objectives in innovative ways to demonstrate excellence, access and impact.

### Leverage Our Place

ASU embraces its cultural, socioeconomic and physical setting.

### Transform Society

ASU catalyzes social change by being connected to social needs.

### Value Entrepreneurship

ASU uses its knowledge and encourages innovation.

### Conduct Use-Inspired Research

ASU research has purpose and impact.

### Enable Student Success

ASU is committed to the success of each unique student.

### Fuse Intellectual Disciplines

ASU creates knowledge by transcending academic disciplines.

### Be Socially Embedded

ASU connects with communities through mutually beneficial partnerships.

### Engage Globally

ASU engages with people and issues locally, nationally and internationally.

### Practice Principled Innovation

ASU places character and values at the center of decisions and actions.

# Mission and goals



## Demonstrate leadership in enabling academic excellence and accessibility at scale

- Maintain the fundamental principle of accessibility to all students qualified to study at a research university.
- Maintain university accessibility to match Arizona's socioeconomic diversity, with undifferentiated outcomes for success.
- Ensure that **more than 90%** of students continue studies beyond their first year.
- Enhance the university graduation rate to **greater than 85%** and more than **45,000** graduates annually.
- Continuously enhance quality while maintaining affordability.
- Overcome geographic and financial barriers to education by enrolling **170,000** online degree-seeking students.
- Continuously increase measured student development and learning outcomes.
- Engage millions of learners of all socioeconomic, geographic and demographic backgrounds.



## Expand ASU's role as the leading global center for interdisciplinary research, discovery and development by 2031

- Catalyze Phoenix as a new Mega Science and Technology City.
- Become the leading American center for discovery and scholarship in the integrated social sciences and comprehensive arts and sciences.
- Enhance research competitiveness to more than **\$1.5 billion** in annual research expenditures.
- Drive regional economic competitiveness through research, discovery and socioeconomically integrated programs.
- Serve as a leading American center for innovation, entrepreneurship and sustainability.
- Create the leading American center for education and learning technology.



## Enhance our local impact and social embeddedness

- Leverage ASU as a public enterprise to strengthen Arizona's interactive network of teaching, learning and discovery resources.
- Co-develop solutions to the critical social, technical, cultural and environmental issues facing 21st-century Arizona, ensuring sustainability and resilience.
- Meet the needs of 21st-century Universal Learners in every family through personalized learning pathways that promote adaptability to emergent social and technological changes.



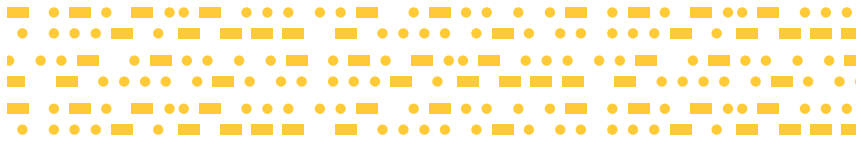
## Design and launch ASU Health as a comprehensive cluster of teaching, learning and discovery health systems for the enhancement of social-scale health outcomes

- Design and launch the Arizona Alliance for Health and Innovation as a coalition to improve Arizona health outcomes.
- Design and launch the Arizona Health Metrics Scorecard as a foundational Decision Theater for Health model.
- Design and launch transformative learning, workforce, technology and care delivery initiatives, such as Food Is Medicine, ASU clinics and a virtual medical school.



## Advance the world's first Global Futures Laboratory

- Expand the role of the Julie Ann Wrigley Global Futures Laboratory as a global leader in delivering solutions to planetary-scale challenges.
- Build capacity to address urgent planetary challenges with speed, scale and immediate impact.
- Design immersive learning spaces rooted in systems thinking to empower learners to tackle complex, global challenges.
- Partner with private-sector leaders to create workforces that align with the demands and opportunities of a sustainable global economy.
- Develop regional Global Futures Laboratory hubs to amplify global reach and local impact, ensuring solutions are globally informed and locally actionable.



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### West Valley takes off

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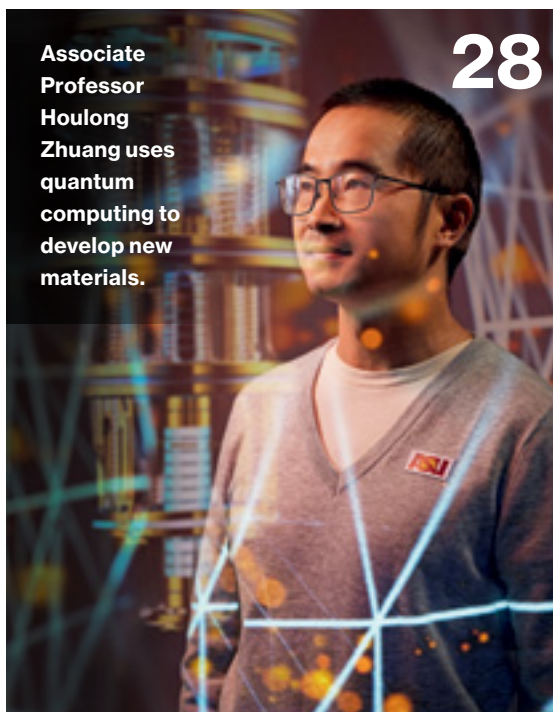
### Golden State innovations, ASU roots

From billion-dollar biotech deals to award-winning wines, these ASU alumni are shaping California's future.

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Kelsey Young, ASU alumna, is an Artemis II science officer.



Associate Professor Houlong Zhuang uses quantum computing to develop new materials.

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## Connect with ASU

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# Events

## Summer camps



### Fashion and film camps

Explore the worlds of film and fashion with experts from The Sidney Poitier New American Film School and ASU FIDM:

**An Introduction to Filmmaking**, June 15–19, Media and Immersive eXperience (MIX) Center, Mesa or ASU California Center Grand, 919 S. Grand Ave., Los Angeles

**Intro to Fashion Design**, June 15–19, Fusion on First, 380 N. 1st Ave., Phoenix or ASU California Center Grand, 919 S. Grand Ave., Los Angeles

**Fashion Merchandising**, June 15–19, ASU California Center Grand, 919 S. Grand Ave., Los Angeles

**Intro to Fashion Design II**, June 22–26, Fusion on First, 380 N. 1st Ave., Phoenix or ASU California Center Grand, 919 S. Grand Ave., Los Angeles

[asufidm.asu.edu/resources/summer/camps](https://asufidm.asu.edu/resources/summer/camps),

[film.asu.edu/resources/summer/summer-camps](https://film.asu.edu/resources/summer/summer-camps)

**Camp** Ages 15–19



### Summer art camps

Learn how to sculpt metal and clay, create a comic, make an animated video and much more at ASU's summer art camps.

**June–July, School of Art**, 900 S. Forest Ave., Tempe  
[art.asu.edu/summer-camps](https://art.asu.edu/summer-camps)

**Camp** Ages 13–18

### Game on

At Camp Level Up++, students build games on the Endstar platform, explore Unity and Unreal Engine skills, and get creative through fabrication and wood workshop activities.

**June 15–July 3, ASU MIX Center, Mesa**  
[asuevents.asu.edu](https://asuevents.asu.edu)

**Camp** Ages 13–19



## A classic tale, newly told

Experience an enchanted production of Disney's "Beauty and the Beast" in celebration of the Broadway musical's 30th anniversary. The timeless tale is brought to life like never before with spectacular new sets and dazzling costumes.

Wednesday, June 24–Friday, July 3, ASU Gammage  
[asugammage.com](https://asugammage.com)

**Family** Ticketed

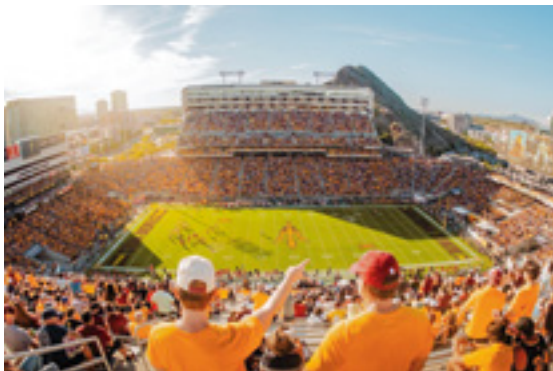


## Step into a world of bold ideas

The “Twilight Series” invites community members and students to explore thought-provoking ideas and fresh perspectives that tackle timely topics shaping our world. Stay for a campus tour. Preregistration encouraged, not required.

July 9, July 23, 6–8 p.m., West Valley campus  
[newcollege.asu.edu/twilight-tours](http://newcollege.asu.edu/twilight-tours)

Free Family



## 2026 Sun Devil Athletics season openers

Cheer on Sun Devil Football as the team opens the 2026 season against Morgan State and prepares for a standout season in the Big 12 Conference. And come out and rally for Sun Devil Volleyball, the back-to-back Big 12 champions.

Sun Devil Football: Saturday, Sept. 5, time TBA, Mountain America Stadium

Sun Devil Volleyball: Thursday, Sept. 10, time TBA, Desert Financial Arena

[sundeils.com/sports/mens/football](http://sundeils.com/sports/mens/football)  
[sundeils.com/sports/womens/volleyball](http://sundeils.com/sports/womens/volleyball)

Family Ticketed



# Get ready for Game Day

## 2026 ASU football schedule



Sept. 5  
vs. Morgan State

Home



Sept. 12  
at Texas A&M



Sept. 19, Big 12  
Kansas (London)



Oct. 3, Big 12  
vs. Baylor

Home



Oct. 10  
vs. Hawai'i

Home



Oct. 17, Big 12  
at Texas Tech



Oct. 24, Big 12  
vs. Kansas State

Home



Oct. 31, Big 12  
at BYU



Nov. 7, Big 12  
vs. Colorado

Home



Nov. 14, Big 12  
at UCF



Nov. 21, Big 12  
vs. Oklahoma State

Home



Nov. 28, Big 12  
at Arizona



Dec. 4, Big 12  
Big 12 Championship




### Sun Devil Rewards has an updated look!

Find it in the ASU Mobile App where you can play fun games, check in to events and redeem your 'Forks for exclusive Sun Devil merchandise and experiences. [sundeilrewards.asu.edu](http://sundeilrewards.asu.edu)

See [asuevents.asu.edu](http://asuevents.asu.edu) for additional ASU events.

Visit [sundeils.com](http://sundeils.com) for athletics updates.

See full game schedules and ticket options at [sundeils.com](http://sundeils.com).



**“By understanding what microbes contribute, we can learn how that plays into the wider ocean chemistry and, importantly, ocean health.”**

— SHERYL MURDOCK, POSTDOCTORAL RESEARCH SCHOLAR WITH ASU'S SCHOOL OF OCEAN FUTURES

#### DIVING DEEP

### Understanding the root of ocean health

Imagine descending nearly a mile and a half into a watery abyss, watching the sunlight disappear as the world around you turns completely black. Then suddenly, you find yourself surrounded by a shower of brilliant, bioluminescent fireworks.

This is just the beginning of a recent ocean expedition taken by a team of researchers from ASU's Bermuda Institute of Ocean Sciences into the realm of deep-sea hydrothermal vents. Here, a place where the sunlight never reaches, marine life thrives even under the extreme hydrostatic pressure.

Their goal was to learn more about nitrogen cycling and the microbial life thriving in these extreme conditions.

Their innovative approach to collecting water, sediment and microbial samples – bringing them to the surface under the same pressure – is expected to bring new insights to our understanding of ocean chemistry, what roles microbes play on the seafloor and how they contribute to ecosystem health and function.

Learn more at [bios.asu.edu](https://bios.asu.edu).



# News



Undergraduate researcher India Rohl hoists research equipment back onto the deck of the Atlantic Explorer, a general purpose oceanographic vessel.



## Rethinking home health care

Maintaining healthy vitals is critical, but home monitoring devices can be inconsistent and expensive. Phoenix-based Mindset Medical makes it as easy as using a smartphone.

The software's platform, Vital-Trac, uses remote photoplethysmography to measure pulse and respiratory rates by detecting light-based changes in blood volume in the skin. These readings can help monitor chronic illness to fevers.

Because the software uses standard cameras, it can operate on phones, laptops and tablets. This allows remote patient monitoring, reduced in-person visits and lower costs relative to traditional medical devices.

Initially pioneered by ASU Professor Nongjian Tao, who died in 2020, and approved by the FDA in 2025, Vital-Trac will help improve health outcomes for Arizonans and beyond.

Learn more at [news.asu.edu/mindsetmedical](https://news.asu.edu/mindsetmedical).



The Padma AgRobotics team tested their AI scarecrows at Blue Sky Organic Farms in Litchfield Park, Arizona.

## More cost-effective and sustainable farming

As rising agricultural costs put a strain on farmers, an ASU alum is working to help farmers by using robotic tools and artificial intelligence.

Raghu Nandivada, '03 MS in electrical engineering, and co-founder of Padma AgRobotics, developed a scarecrow with his team that's been put to work at Blue Sky Organic Farms in Litchfield Park, Arizona. His innovation features an inflatable tube man mounted on a robot equipped with an AI system that processes inputs from multiple lidar sensors and GPS to enable autonomous navigation and real-time obstacle avoidance, ensuring safe operation around farmworkers and vehicles.

"Replacing them [scarecrows] with a moving robot that's doing the same job and can do it endlessly — 12 hours a day — makes a lot of sense," David Vose, the farm's owner, says.

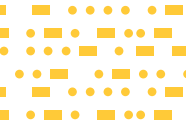
It's also less expensive than human labor.

Padma AgRobotics is also partnering with Duncan Family Farms in Surprise and Desert Premium in Yuma to develop robots that can spray crops, as well as harvest, bunch and wrap cilantro.

Learn how ASU is developing solutions to help Arizona farmers at [news.asu.edu/content/agriculture](https://news.asu.edu/content/agriculture).

**"Farmers are being squeezed, and automation is one way to help them be sustainable."**

— RAGHU NANDIVADA,  
FOUNDER OF  
PADMA AGROBOTICS



**“This tool gives them a way to quickly visualize where gaps might exist, direct mobile pantries, consider new distribution sites or tailor outreach to specific populations.”**

– CONNOR SHEEHAN, ASSOCIATE PROFESSOR  
IN THE T. DENNY SANFORD SCHOOL OF SOCIAL  
AND FAMILY DYNAMICS



## Helping food pantries better serve the state

Over 1 million Arizonans experienced food insecurity in 2023, according to Feeding America. In response, ASU's Data Devils program created the Arizona Food Insecurity Dashboard, which brings together multiple data sources, including census demographics, food insecurity estimates, SNAP participation rates and vehicle access. This data helps food banks track areas where food insecurity is most concentrated and make decisions about how to allocate scarce resources more effectively.

Local nonprofit partners like St. Mary's Food Bank, United Food Bank, Community Food Bank of Southern Arizona and Yuma Community Food Bank are already using it after being trained in the tool by ASU graduate and undergraduate students.

Learn more at [thesanfordschool.asu.edu/data-devils](https://thesanfordschool.asu.edu/data-devils).



## Strategic staffing gets federal nod

The U.S. Department of Education recognized strategic staffing as a way to improve education and address teacher shortages.

The model, developed at ASU's Mary Lou Fulton College for Teaching and Learning Innovation, uses a team-based approach where at least two educators share responsibility for a larger group of students.

Students taught in ASU's Next Education Workforce strategic staffing environments gain 1.4 more months of reading growth and higher rates of passing Algebra I than students taught in traditional settings. Educators also see lower rates of turnover and greater overall job satisfaction.

While ASU has already partnered with schools nationwide to implement the model, federal support will help bring the solutions to even more classrooms.

Learn more at [workforce.education.asu.edu](https://workforce.education.asu.edu).



## Stopping locust outbreaks in their tracks

Locust swarms, which may conjure images of ancient famines, remain a serious problem worldwide. They can destroy crops across regions and ruin livelihoods.

So when Arianne Cease, director of ASU's Global Locust Initiative, and her international team of scientists found a simple soil-based method to keep locusts from eating crops, they knew their work could change people's lives. To the team's knowledge, theirs is the first study to test this new method in real-world farming conditions and confirm that it works.

They identified that locusts thrive on high-carb, low-protein vegetation grown in nutrient-poor soil and tested it by partnering with 100 farmers in Senegal who experience outbreaks of the Senegalese grasshopper. Each farmer grew two plots of millet – one treated with nitrogen fertilizer for higher-protein crops and one untreated. The treated plots showed three clear differences: fewer locusts, less crop damage and a doubled crop yield.

The U.S. has no locust species inside our borders. Why study them here at all? Cease says it won't stay that way forever, and the more we learn about them, the better we can address migratory pests at home while helping farmers in other places solve their locust challenges.

Learn more at [globalfutures.asu.edu/global-locust-initiative](https://globalfutures.asu.edu/global-locust-initiative).

**“Mapping snow cover with these airborne technologies is a first of its kind for the state of Arizona.”**

— ENRIQUE VIVONI, PROFESSOR WITH THE SCHOOL OF SUSTAINABLE ENGINEERING AND THE BUILT ENVIRONMENT

#### RESOURCE PLANNING

### Improving water supply forecasting from the sky

For the first time, a collaborative research team is using an airplane equipped with state-of-the-art scanning lidar and imaging spectrometers, along with innovative computational modeling from ASU, to measure snowpack in the Salt River watershed and determine how much water it contains.

“This information is ... used to feed hydrologic forecasts that provide state-of-the-art runoff predictions that help manage water supply in Arizona,” says Professor Enrique Vivoni, primary investigator for the joint project and developer of the models.

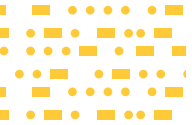
The SRP watershed, whose reservoirs supply water to more than 2.5 million Valley residents, has historically been challenging to measure due to rapidly changing snowpack conditions.

This solution aims to close critical gaps in SRP’s monitoring capabilities, enabling more precise and reliable water management throughout the year.

Learn more at [ssebe.engineering.asu.edu](https://ssebe.engineering.asu.edu).



**Airborne Snow Observatories Operations Scientist Kat McNeal shows where scanning lidar maps snowpack during flights, using laser pulses to measure snow depth across the landscape.**



## Uncovering the city’s mosquito hot spots

Mosquitoes aren’t just a nuisance; they can carry diseases like West Nile virus, and their populations are on the rise in the U.S. despite city- and county-level control efforts.

That’s why Kelsey Lyberger, an assistant professor in ASU’s School of Applied Sciences and Arts, and her student researchers logged temperatures and collected mosquito larvae at 24 microhabitats across Phoenix to understand where, when and why they thrive.

Using this data, Lyberger and her students will apply mathematical modeling, combined with more precise temperature data, to predict mosquito seasonality.

They plan to use these insights to inform Maricopa County on how best to cap mosquito populations and mitigate disease transmission to humans.

Learn more at [cisa.asu.edu](https://cisa.asu.edu).



Students analyze mosquito larvae in the field.

**“We hope to use our findings to inform Maricopa County ... of where and when transmission will occur.”**

— KELSEY LYBERGER, ASSISTANT PROFESSOR IN THE SCHOOL OF APPLIED SCIENCES AND ARTS



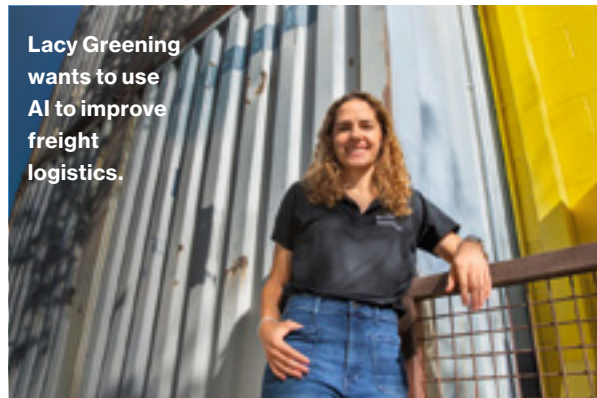
## Putting semiconductor technologies to the test

When technology fails in extreme environments — like in outer space or deep underground — replacing it is difficult and costly.

That’s why U.S. semiconductor company Microchip Technology partners with ASU’s Extreme Environments Lab to test how its products hold up against intense levels of radiation. As part of the Southwest Advanced Prototyping (SWAP) Hub, the lab provides access to shared facilities, equipment and expertise to strengthen U.S. technological leadership.

Learn more at [microelectronics.asu.edu](https://microelectronics.asu.edu).

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Lacy Greening wants to use AI to improve freight logistics.

## Driving down freight costs with AI

America’s freight system is a miracle of modern logistics most of the time.

But a snowstorm, labor shortage or delayed truck outside a major hub can disrupt the process. It operates as if the world is predictable, when in reality freight moves through ever-changing, interconnected systems.

That’s why Lacy Greening, an assistant professor in ASU’s School of Computing and Augmented Intelligence, is developing a three-tier, agentic AI framework to streamline and secure freight supply chains.

At the bottom layer, AI agents ingest data such as weather, traffic, equipment health and workforce availability. In the middle, planning agents reroute trucks, reschedule docks and rebalance resources as conditions change. At the top, humans oversee decisions and step in when stakes are high.

In practice, that means each part of the freight network can adjust in real time and avoid costly delays — which can help keep the prices of goods more affordable.

Greening was recently named one of 15 semifinalists in the U.S. Department of Transportation’s Advanced Research Projects Agency – Infrastructure, or ARPA-I, Innovation Challenge, and will move on to the finals.

Learn more at [scai.engineering.asu.edu](https://scai.engineering.asu.edu).

**“Our best chance to cure [colorectal] cancer is to detect it early.”**

— DR. JOSHUA LABAER,  
EXECUTIVE DIRECTOR OF THE  
ASU BIODESIGN INSTITUTE

#### PREVENTATIVE CARE

### New screening to detect young-onset colon cancer

Colorectal cancer is now a leading cause of death in adults under 50, and rates continue to rise.

One major risk factor is Lynch syndrome, a hereditary condition that impairs DNA repair. It carries an 80% lifetime risk of colorectal cancer, says Dr. Jewel Samadder, a gastroenterologist at Mayo Clinic Comprehensive Cancer Center in Arizona.

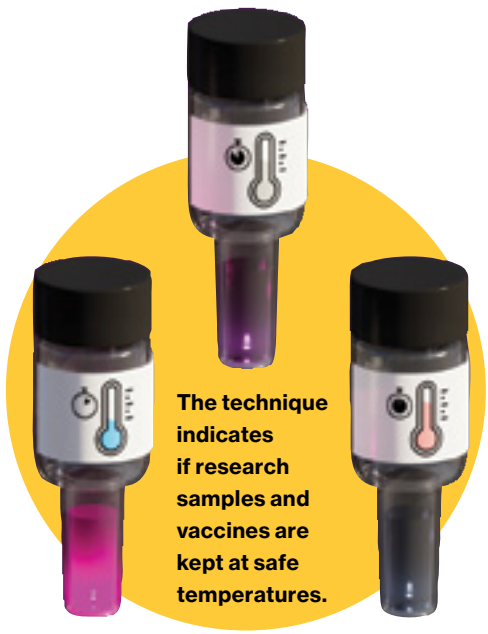
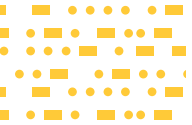
“Cancers caused by Lynch syndrome are similar but different from the common colon cancers, so our best chance to cure cancer is to detect it early,” says Dr. Joshua LaBaer, executive director of the ASU Biodesign Institute.

People with Lynch syndrome often undergo annual colonoscopies and intensive surveillance. Researchers at Mayo Clinic and ASU aim to change that with a noninvasive blood test to detect colorectal cancer earlier – especially in high-risk individuals, and potentially, the broader population.

“This is really the perfect marriage of Mayo Clinic and ASU to leverage the strengths of the two institutions,” Samadder says. “Mayo brings deep clinical strength and strength in patient recruitment – combined with ASU’s strengths in computing, bioinformatics and discovery science.”

Learn more about ASU research at [news.asu.edu/research-matters](https://news.asu.edu/research-matters).

Dr. Jewel Samadder’s work with ASU’s Biodesign Institute focuses on colorectal cancer detection.



The technique indicates if research samples and vaccines are kept at safe temperatures.

## New invention keeps biospecimens safe at ultra-cold temperatures

Keeping vaccines and research samples at the right temperature isn't easy, and even a brief deviation can result in wasted resources, failed experiments or even reduced effectiveness.

That's why a research team at ASU, led by Chad Borges, an associate professor in the School of Molecular Sciences, developed chemical time-temperature indicators, or TTIs, that can stay active at much lower temperatures, down to -37 C, or even -67 C, and identify compromised samples.

At first, the indicator holds its color steady, but then it suddenly fades completely – providing a clear visual signal that time and temperature thresholds have been exceeded.

Already on the market via Borges' startup CryoVeritas and pending patent certification, the technology is starting to see adoption by research labs and companies across the country.

See the invention in action.



## Smarter ways to peer into the microscopic world

Microscopic organisms play vital roles in human health and ecosystems. Yet even with modern DNA sequencing, identifying them and their relationships remains difficult.

That's why ASU researchers, led by Assistant Professor Qiyun Zhu, developed two new tools that make this work easier, more accurate and scalable.

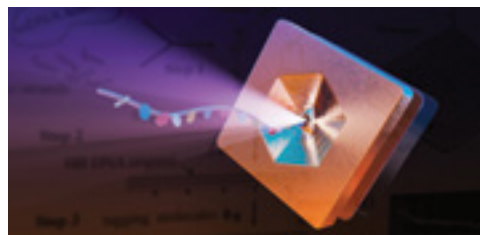
Tree-based Marker Selection, or TMarSel, helps scientists build better evolutionary trees and track harmful microbes. Scikit-bio analyzes large biological datasets, especially microbiomes – microbial communities in environments like the human gut.

Together, these tools help with microbiome research, disease tracking, environmental monitoring and emerging fields like precision medicine.

Learn more at [biodesign.asu.edu](https://biodesign.asu.edu).

**“By treating DNA as an information platform rather than just a genetic material, we can begin to rethink how data is stored, read and secured at the nanoscale.”**

— HAO YAN, REGENTS PROFESSOR IN THE SCHOOL OF MOLECULAR SCIENCES



## DNA as a solution to our enormous data storage problem

As the world generates tremendous volumes of digital information, today's storage technologies are struggling to keep up. Two new studies from ASU's Biodesign Institute propose a solution: DNA.

In the first, new research describes the design and construction of tiny DNA structures that act like physical letters in an alphabet, each carrying a piece of information. As they pass through a microscopic sensor, machine learning analyzes their electrical signatures. Then, the system can translate the data back into readable words, creating a way to use the DNA to store data.

The second uses intricate DNA origami structures that encode information in their arrangement and pattern, increasing the number of possible molecular codes and making unauthorized decoding far more difficult.

Together, the advances could allow the world to store vastly more data in less space, for longer and with greater security – while laying the foundation for a new industry at the intersection of biology and microelectronics.

Learn more at [biodesign.asu.edu](https://biodesign.asu.edu).



# SMILES OUT. FORKS UP.<sup>®</sup> LET'S GO ASU.<sup>®</sup>

Ignite the inferno every gameday with a confident smile and Invisalign<sup>®</sup> aligners – the choice of over 20 million people worldwide:



\*Data on file at Align Technology, March 31, 2025.

align<sup>®</sup> © 2025 Align Technology, Inc. Align, Invisalign, and the starflower mark are trademarks of Align Technology, Inc.

# Career

## MY 1 CAREER TIP

### **‘Be responsible, but take the risk’**

Lindsay Benjamin, '02 BA in political science and BA in philosophy, the founder of Benjamin Legal, helps Arizona residents with prenuptial agreements, divorce, child custody and other sensitive family law matters. Since 2006, the law firm has handled hundreds of cases each year. She also created Simple Family Law to provide clear, step-by-step guidance so people can handle their own divorces when hiring an attorney is not financially possible.

**“A lot of people stop before something has the chance to succeed. ... It is scary, but unless you commit fully, it will not work.”**

Lindsay Benjamin's legal team combines more than 30 years of specialized experience in family law practice.



# 3 ways to create the **‘Lasso effect’** for your team

What a hit TV series can tell us  
about good management

Story by MARSHALL TERRILL



## “What if belief itself is a leadership tool that spreads from person to person?”

— CHRISTOPHER NECK, PROFESSOR IN THE DEPARTMENT OF MANAGEMENT AND ENTREPRENEURSHIP



When “Ted Lasso” first bounced onto screens in 2020, it wasn’t just the mustache, locker room antics or the one-liners that stuck – it was the infectious optimism. The show’s central question was deceptively simple: What happens when a leader’s belief in people is so genuine that it starts to spread?

Drawing directly from the spirit of the Apple TV hit, ASU Professor Christopher Neck coined the “Lasso effect” in his recent paper, “The ‘Lasso Effect’ – Toward the Development of a Theory of Motivational Contagion.” The idea is that motivation doesn’t stay neatly contained within individuals. Instead, a leader’s energy, mindset and purpose can ripple outward, shaping how teams feel, perform and persevere.

Most people have experienced a version of the “Lasso effect” without realizing it, Neck says. Think of a manager whose mood in the first few minutes of a Monday meeting determines whether the team feels energized or deflated for the rest of the week. Without saying a word about motivation, that leader has already set it in motion.

Do you want that kind of impact on your own team? Here are three ways to start creating it.

### Model the energy you want multiplied

“Studies suggest that when leaders consistently display positive energy such as enthusiasm, optimism and genuine engagement, that energy spreads through the team and increases effort, persistence and focus,” Neck says. “People copy what they see.”

**What to ask yourself:** “What kind of energy am I spreading when I show up each day?”

Tip  
1




## Tip 2

### Express belief out loud

“Ted constantly tells people he believes in them, even when they struggle to believe in themselves,” he says. “Simply telling someone you trust their ability to handle a challenge can be incredibly powerful.”

**What to ask yourself:** “What if belief itself is a leadership tool that spreads from person to person?”




**“Simply telling someone you trust their ability to handle a challenge can be **incredibly powerful.**”**

— CHRISTOPHER NECK, PROFESSOR IN THE DEPARTMENT OF MANAGEMENT AND ENTREPRENEURSHIP

## Tip 3

### Spread motivation evenly, not just around the loudest voices



“Shared motivation acts like a spotlight that moves around the team instead of staying fixed on a few stars,” Neck says. “Leaders who publicly recognize effort, invite participation and spread encouragement help ensure motivation reaches everyone, not just the loudest voices.”

**What to ask yourself:** “Is motivation something people receive on my team, or something they have to fight for on their own?” ■



**Learn more about career development.**

# Career upskilling, personal growth



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## Transform supply chain disruption into opportunity

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Gain skills to analyze complex challenges, identify opportunity and align strategy with measurable goals in the "Strategic Thinking Professional Certificate." 32 hours; \$299; professional certificate available upon completion.

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Self-paced Online



## Apply AI-driven strategies to sustainability challenges

Explore how artificial intelligence can advance conservation, resource management and climate action in "AI and Sustainability: Digital Innovation for a Changing World." 1.5 hours; \$149; digital badge available upon completion.

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### LEARNING RESOURCES

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Explore how the American founders understood happiness as rooted in character, virtue and civic responsibility in "What the Founders Meant by Happiness." Self-paced; free; digital badge available upon completion.

[pi.asu.edu/courses/civic-virtue](http://pi.asu.edu/courses/civic-virtue)

Self-paced Free Online



## Enrichment for young Sun Devils

Check out these activities, games, videos from Sparky and more. From a geology backyard hunt to ASU coloring sheets, there's something fun and educational for your little Sun Devils to explore.

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

Free Family



## Shape next-gen electronics

Learn about semiconductor packaging principles, materials and manufacturing processes. "Semiconductor Packaging Design and Manufacturing Certificate" is designed for students, early-career professionals and technicians. 20-30 hours; \$799; certificate available upon completion.

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



Certificate program  
Self-paced Online

## Elevate your project management skills

Project management is a high-growth career path across every industry. Prepare for the globally recognized CAPM® credential with the "CAPM® Exam Prep Professional Certificate."



Complete the official PMI® education hours. 29 hours; \$799; professional certificate available upon completion.

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Certificate program  
Self-paced Online

## Cultivate a winning team

Develop strategies to strengthen communication, build trust and support positive team culture through the NASA Psyche Mission Innovation Toolkit. Build leadership skills with "Inclusive Mindset: Tools for Building Positive Team Culture." 20 hours; free; certificate available upon completion.

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



Certificate program  
Self-paced Free Online



# Industries on the rise

## The changing job market and degrees to meet the need

A transforming economy is creating opportunities for graduates prepared to lead. In supply chain alone, employment of operations research analysts is projected to grow 21% by 2034 as companies develop smarter, more resilient systems.

Investment is also accelerating in semiconductor development and virtual reality technologies with \$2 trillion and \$1.5 trillion projected, respectively, to boost the global economy within the next decade.

Specialized business disciplines such as financial management and information security are growing about five to 10 times faster, respectively, than average.

Meanwhile, U.S. life sciences research is expanding, with record numbers of professionals and strong growth in roles like medical scientists, biochemists and biophysicists.

At the same time, critical gaps in mental health services are driving demand for qualified psychologists across the country.

ASU is responding with degree programs that ensure graduates are not just prepared to enter the workforce, but advance it.



See other jobs forecasts at [news.asu.edu/interests/employment](https://news.asu.edu/interests/employment).

## Some of the programs that will get you there

- Master of Electrical Engineering
- MS in materials science and engineering
- MS in psychology
- MS in media arts and sciences (extended reality technologies)
- MS in immersive experience design
- MS in supply chain management
- MS in finance
- MS in program and data analytics
- MS in biomedical informatics and data science

Learn more at [degrees.asu.edu](https://degrees.asu.edu).

# Jobs forecast

**29%**  
projected  
employment  
growth

for information  
security  
analysts from  
2024 to 2034

**3X**  
the national  
average job  
growth rate

projected  
for medical  
scientists  
by 2034

**136,000**  
new  
psychologists

required to  
fulfill unmet  
need in the U.S.  
by 2038

**146,000**  
new  
engineers and  
technicians

needed in the  
semiconductor  
field by 2029

**90%**  
of companies  
worldwide

report insufficient  
talent to support  
supply chain  
digitization

**\$2**  
trillion

total global  
semiconductor  
industry  
revenue  
by 2036

**\$1.5**  
trillion

potential boost to  
the global economy  
from virtual  
and augmented  
reality by 2030

**\$80.7**  
billion  
value of AI

in global health  
care market  
by 2036

SOURCES: DELOITTE, MCKINSEY & COMPANY, BUREAU OF HEALTH WORKFORCE, FUTURE MARKET INSIGHTS INC., U.S. BUREAU OF LABOR STATISTICS, PWC SWITZERLAND

Jason Zach (left), '25 BS in engineering (mechanical engineering systems), then a mechanical systems engineering student, works with Jacob Cousins, '25 BS in engineering (robotics) at Array Technologies in Chandler to support the expanding field of solar technology.

“There have been times when I’ve reached out to many of my professors to seek advice on my career – regarding jobs, a job switch or even ideating on new ideas given the AI boom and applications within supply chain. If I had an innovative thought, I would run it by them, and they would still always answer my call.”



VARUN VEDA,  
'24 MS IN  
BUSINESS  
ANALYTICS,  
SENIOR SUPPLY  
CHAIN ANALYST  
AT MICROSOFT

“The combination of mentorship is really unique. [In addition to my advisors,] I feel very comfortable asking professors that I have taken classes with or just run into in the faculty building.”



EMILIA BERKES,  
'23 BS IN  
PSYCHOLOGY,  
CURRENT  
GRADUATE  
PSYCHOLOGY  
STUDENT



# Lunar launch

ASU alumna Kelsey Young  
is the Artemis II mission's  
lunar science lead

During the lunar flyby period, the Artemis II crew observed parts of the moon that had never been seen by human eyes.

**When Artemis II launched in April**, sending astronauts around the moon for the first time in more than 50 years, the mission broke records – and will help scientists understand undiscovered secrets, including the history of Earth and our solar system.

As lunar science lead for NASA's Artemis II mission, Kelsey Young, '12 MS and '14 PhD in geological sciences, led the team that developed the lunar science plan and trained the crew to study the moon.

In this mission, the crew carried out scientific observations of the moon's surface, including the far side and a huge crater called the Orientale Basin that wasn't observed during the Apollo missions.

The launch made history as the first crewed flight to the moon in over 50 years, breaking the distance record previously held by Apollo 13 for the farthest humans have traveled from Earth.

This mission also will help get the U.S. ready for the big moment of landing humans on the moon again in Artemis IV, as well as for deep space exploration, including paving the way for going to Mars.



Learn more about Young's time at ASU at [sese.asu.edu](https://sese.asu.edu).



### SIMULATIONS ON EARTH

Test subjects Kelsey Young and Tess Caswell evaluate lunar field geology tasks as part of the Exploration Extravehicular Activity (xEVA) night operations development tests conducted at Johnson Space Center's Rock Yard.



**The Artemis II mission with four astronauts on board launched into outer space in April.**

**At ASU, Young says she cultivated a love of space science. “I discovered my passion for linking what I had always seen outdoors hiking with my family to what we can see on the surfaces of other planets. It’s this analog approach to planetary science that has become the focus of my career.”**



**“The science officer is the senior flight controller responsible for lunar science and geology objectives during Artemis missions,” Young, who serves as NASA’s Artemis II lunar science lead, said in a NASA article. “They will integrate with all the other console disciplines and ensure NASA’s lunar science objectives are seamlessly integrated into mission execution.” ■**



THE

# quantum

Researchers and students are helping shape quantum computing, which could revolutionize health care, materials discovery, supply chains and more

Story by MAKEDA EASTER  
Photos by JEFF NEWTON

# frontier

Houlong Zhuang is using quantum technology to create materials that withstand extreme heat and cold.

## When ASU's Christian Arenz starts teaching quantum mechanics, he expects to see plenty of confused faces.

But a few weeks into the semester, that uncertainty often turns into excitement. Arenz, an assistant professor in the School of Electrical, Computer and Energy Engineering, who came to ASU from Princeton, watches as students begin to understand the potential of quantum computing. It's a fast-growing field that aims to solve problems too complex for today's supercomputers and speed up the process of making new medicines and improving cybersecurity, financial modeling and more.

At ASU, scientists already are applying quantum computing to accelerate materials discovery, improve supply chain logistics and develop new approaches to artificial intelligence. They are also working on improving the underlying technical challenges to make quantum technology more practical.

"When people hear the word quantum, everyone thinks, 'Oh that must be really complicated, and hard mathematically,'" says Arenz. "It has a lot to do with motivation and approach ... everyone can learn it."

While experts say quantum computing is not going to replace classical computers – the cell

phones and laptops we use daily – or the supercomputers researchers use for groundbreaking discoveries, they envision the various types of computing power working in tandem to solve problems currently out of reach.

Although quantum computing remains somewhat experimental, global interest is exploding. According to McKinsey & Company, quantum computing could generate up to \$72 billion in revenue in 2035.

Quantum computers are costly – one estimate suggests tens of millions of dollars – and complex to build and maintain. ASU doesn't have its own quantum computer. But through support from the Research Technology Office, researchers and students can access tools that allow them to simulate quantum computing algorithms to run their experiments on classical high-performance computers with the possibility of connecting to quantum computers remotely, says Gil Speyer, director of ASU's Computational Research Accelerator.

The university also leads the Quantum Collaborative, which connects national laboratories, companies, academic institutions and startups. Through it, students gain direct access to top-notch education and training opportunities that offer the skills needed to be at the forefront of quantum innovation.

And ASU is invested in growing a quantum-ready workforce. Arenz's introductory class is part of a series of courses, and one of many offerings across campus alongside research programs and workshops designed to prepare the next generation of quantum scientists.

### Supporting student discoveries

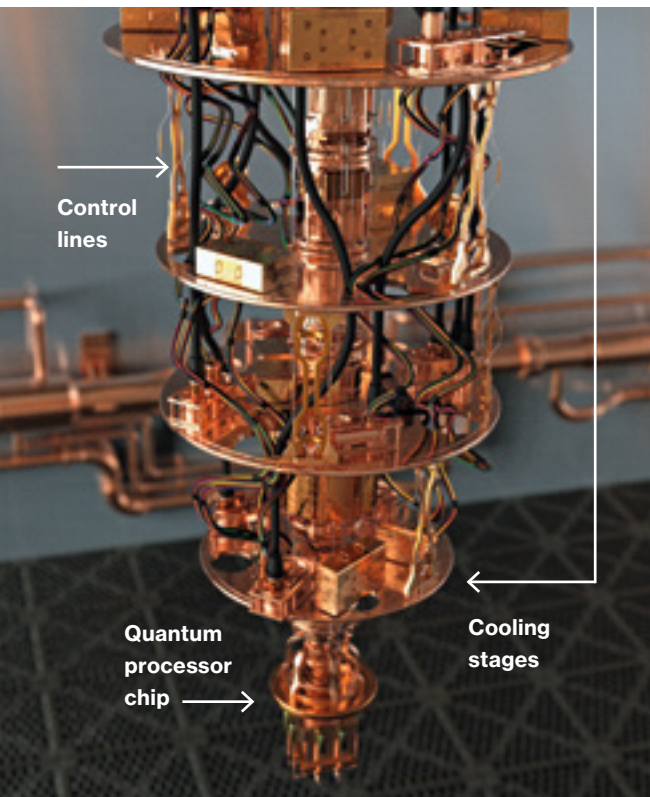
Most students who take classes with Gennaro De Luca, an instructor in the School of Computing and Augmented Intelligence, begin with zero quantum experience. The course goes from the basics of quantum computing into his own area of research – quantum generative models.

To introduce students to these concepts, he starts with cats.

De Luca walks students through a thought exercise: Using a limited set of cat pictures, what does



**Tijana Rajh is trying to help build a quantum computer that does not require temps as cold as outer space.**



## Inside a quantum computer

On regular computers, from cell phones to supercomputers, all information is stored as bits. Each bit is either a 0 or 1, like a switch that is turned off or on.

Quantum computers work differently, using quantum bits, or qubits. Instead of just a 0 or 1 value, qubits can exist as both at the same time. Like a midair coin flip, which could be heads or tails, qubits have the probability of being 0 and 1. This is called superposition.

Qubits also can be entangled, or intrinsically linked with each other while in a state of superposition.

These properties allow quantum computers to perform many calculations at once, giving them a potentially exponential boost over classical computers' computing power.

it take to generate entirely new pictures of cats? At a basic level, generative models analyze patterns in the details – the fur, shapes and colors – to produce new cat pictures.

“Theoretically, it’s been shown that quantum computers can learn from fewer images than classical,” De Luca says.

De Luca’s students have used university resources to pursue quantum projects – from an educational project to simplify quantum machine learning for others, to building a Lego robot car controlled entirely by a quantum image-processing algorithm.

One tool they use is Nvidia’s CUDA-Q, a software package that takes advantage of the accelerated processing power from specialized computer chips, called GPUs, or graphics processing units. CUDA-Q can simulate a quantum environment and can be run on a laptop, or for larger projects, on ASU’s Sol supercomputer, which is among the most powerful in the world. Sol is nearly 2,000 times more powerful than a modern-day laptop. CUDA-Q can also support cloud-based access to real quantum computing platforms, such as the one at IBM, across the country.

Another tool is an accelerator card called a Vector Engine, which simulates a “specialized quantum computing platform used for quantum optimization,” Speyer says. This tool was recently used by a team of researchers at the W. P. Carey School of Business’ Department of Supply Chain Management to work on problems

related to transportation logistics.

## Supercharged material discovery

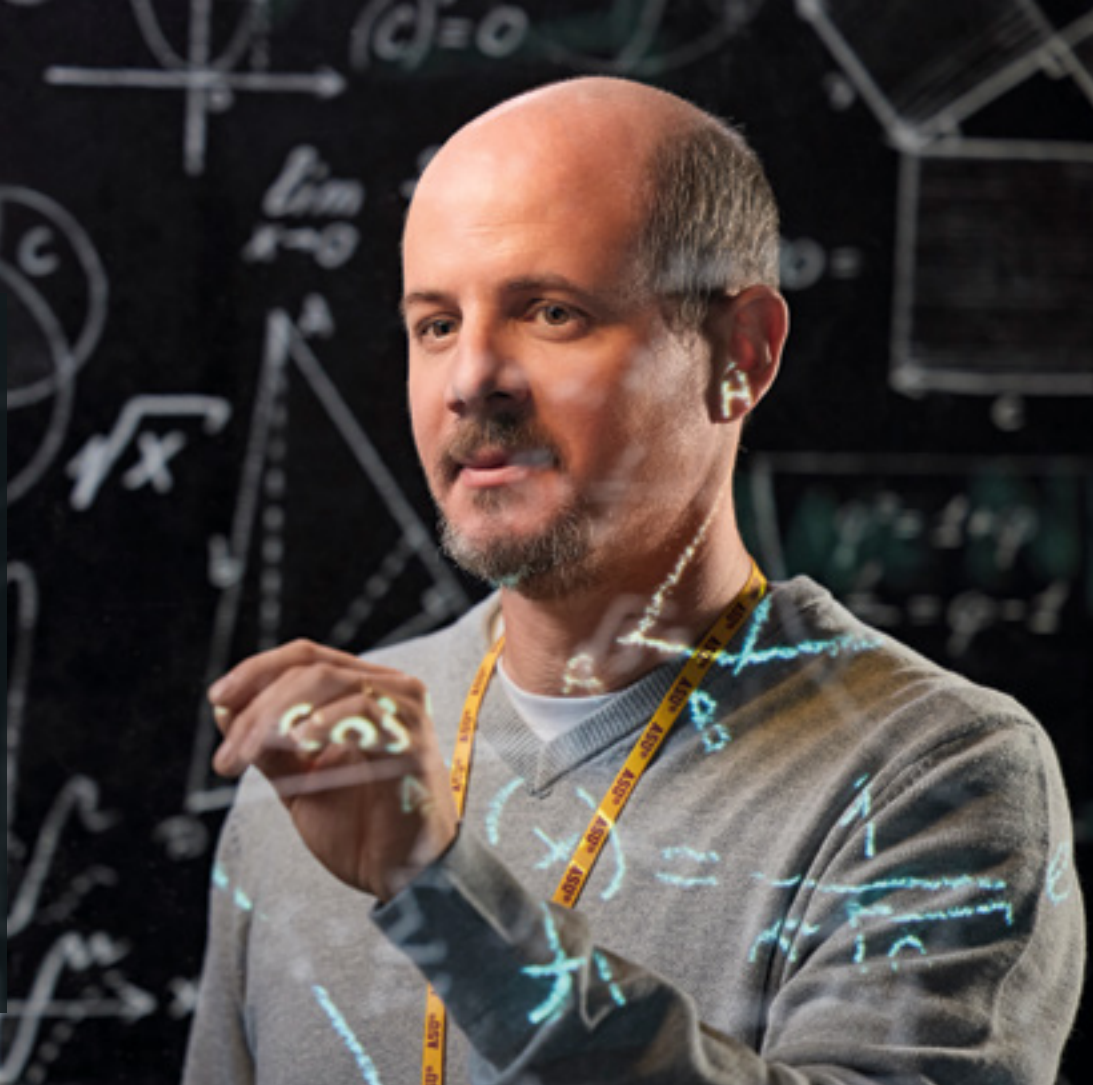
Discovering new materials often requires years of trial and error. At ASU’s School for Engineering of Matter, Transport and Energy, Associate Professor Houlong Zhuang is using quantum computing to dramatically accelerate that process.

In recent years, he has used the emerging technology to help develop high-entropy alloys, a type of material which does not melt or weaken in extreme heat, stress and radiation. This class of materials is often used in advanced defense systems such as hypersonic aircraft and nuclear-powered submarines.

Quantum computing can significantly speed up the design and production of new materials in a lab.

“Typically if we run a simulation, it takes several weeks. Now it can take several days using a hybrid strategy,” Zhuang says. As quantum computing continues progressing, “Ideally, we can reduce the several days to maybe one day or several hours.”

Zhuang, whose research and educational outreach efforts earned a \$537,000 Career award from the National Science Foundation, is also using these methods to advance sustainability research, working to identify materials that can address carbon-dioxide capture, hydrogen transport and storage, and developing new semiconductors for solar energy conversion.



**“There’s a huge shortage in the workforce. I tell everyone in class that even if you don’t end up going to quantum, the expertise or what you learn through that is very crucial.”**

— CHRISTIAN ARENZ,  
ASSISTANT PROFESSOR  
IN THE SCHOOL OF  
ELECTRICAL, COMPUTER  
AND ENERGY ENGINEERING

### Making quantum technology more available

Other researchers at ASU are focused on improving the technology itself.

Quantum computers can be prone to errors. The incredibly intricate and fragile nature of quantum systems makes them susceptible to noise – disturbances that produce errors in quantum computation. Noise can be caused by physical vibrations of the hardware, temperature changes, cosmic rays and other microscopic interruptions.

Arenz studies noise mitigation and suppression, an area of research that could make quantum computers more reliable.

Quantum hardware is also

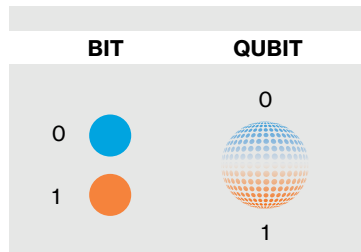
physically complex, often requiring elaborate refrigeration systems that cool processors to temperatures colder than outer space. At the School of Molecular Sciences, Director Tijana Rajh backs research to build quantum computers that don’t need such precise extreme cold.

In her role, she supports faculty like Assistant Professor Justin Earley, who is interested in

designing and building quantum devices that work in everyday conditions. Earley studies qubits – the most basic units of information in quantum computing – made from molecules. Molecular qubits show the potential to operate at higher temperatures, which could support quantum technology’s shift from the lab to the real world.

“We have to start thinking about how we move away from this ultra-cold temperature,” Earley says. “Otherwise it’s going to be resource prohibitive and cost prohibitive.”

Earley is also excited by how the technology can be applied to health care. Quantum sensors could one day be used in medical diagnostics, detecting diseases far earlier than current technologies.





Justin Earley is excited about how quantum computers can help with medical discoveries.

**“We have to start thinking about how we move away from this ultra-cold temperature. Otherwise it’s going to be resource prohibitive and cost prohibitive.”**

— JUSTIN EARLEY, ASSISTANT PROFESSOR, ASU’S SCHOOL OF MOLECULAR SCIENCES

Quantum technology businesses are even moving into the ASU Research Park in Tempe, including Quantum Computing Inc. with its state-of-the-art quantum photonic chip foundry.

Arenz reflected on his own experience as an undergraduate and how rapidly the field is evolving. At conferences about 20 years ago, researchers began talking about the basic building blocks of a quantum computer.

“I could not believe that some day researchers would like to make a computer out of these large and complex experimental settings. But, here we are,” he says.

Now, “Companies like IBM and Google have built quantum devices.”

By the time more of his students transition into careers, he hopes quantum computing will have achieved its next milestone in the next five to 10 years: outperforming a classical computer. ■

### Addressing a labor shortage

Like others in quantum at ASU, Earley works with students at nearly every stage of the pipeline, from high school interns to PhD candidates, helping them move past early intimidation and pursue projects that deepen their understanding and advance real-world applications.

One of Arenz’s students, Vicente Peña Pérez, a PhD candidate, is an intern at Sandia National Laboratories and will go full time this summer, working at the intersection of quantum computing and materials science.

Advancing quantum computing

and mentoring the next generation go hand in hand. Today, there is a broad range of opportunities to pursue quantum computing across industry, academia and government, in roles like quantum algorithm developers, data scientists and designing quantum chips. There is also a need for people who can advise companies that invest in the technology, and nontechnical roles working in business development.

“There’s a huge shortage in the workforce,” Arenz says. “I tell everyone in class that even if you don’t end up going to quantum, the expertise or what you learn through that is very crucial.”

**“Instead of spending thousands of hours sorting through every warning, you spend 10 minutes reviewing the ones that actually matter.”**

– WIL GIBBS, COMPUTER SCIENCE DOCTORAL STUDENT,  
CYBERSECURITY STARTUP FOUNDER

#### SAFER FUTURES

### Staying one step ahead of hackers

Every morning, computer security engineers slide behind their desks, open their dashboards and brace for impact.

A thousand warnings. Red flags stacked on red flags. Automated scanners screaming about code injections, memory corruptions and compliance violations. Somewhere in that digital haystack is a needle — a real, exploitable vulnerability. But good luck finding it before a hacker does.

The tragedy of modern cybersecurity isn't that we can't find bugs. It's that we find too many.

Wil Gibbs, '18 BS in computer science (cybersecurity) and '20 MS in computer science, is a computer science doctoral student specializing in cybersecurity in the School of Computing and Augmented Intelligence.

After spending two years building artificial intelligence systems that find and fix software bugs as part of a competitive cybersecurity team, he's now the CEO of a startup called Artiphishell, and he's betting \$1.5 million that he can turn academic cyber-wizardry into something enterprises will actually use.

Learn more at [ctf.asu.edu](http://ctf.asu.edu).

Doctoral student Wil Gibbs turned his research into a tech startup that will provide cybersecurity solutions powered by AI to industry and enterprise clients.



## Sprouts Farmers Market

Curtis Valentine, '06 MBA, CFO, and Brandon Lombardi, '00 BS in global business (financial management), '03 JD, chief legal officer and chief sustainability officer

- 36K employees
- Headquarters: Phoenix
- Years in business: 24
- Yearly revenue: \$8.8B

Mika Dubey (left), Brandon Lombardi, Curtis Valentine and Danny Mendez.



STRO  
FARMERS

ORGANIC

ORGANIC

# Hiring power

**How the Sun Devil 100 are fueling growth by building businesses as well as hiring from their alma mater**

**Story by** CAROLYN SAID  
**Photos by** SABIRA MADADY  
AND JILL RICHARDS





**From grocery aisles to construction sites, residential building products and advanced manufacturing, businesses led by ASU alumni are creating jobs and expanding in a way that supports families and businesses in Arizona and beyond.**

This is the homegrown innovation that fills the ranks of the Sun Devil 100. This elite group of entrepreneurs and corporate leaders spans a wide array of industries and employs 218,481 people full time. The organizations in this year's group collectively reported a total revenue of \$74.8 billion for the 2024 fiscal year.

Four Sun Devil 100 standouts – Sprouts Farmers Market, GCON, Awake Window & Door and azbil North America – show what that growth looks like.

A common thread is a lasting connection to ASU, including hiring graduates, mentoring students and applying an entrepreneurial mindset shaped on campus. The result is a powerful feedback loop – one where education fuels innovation and alumni reinvest in the next generation.

**Sprouts Farmers Market: Homegrown goodness**

Rooted in Arizona and growing rapidly nationwide, Sprouts Farmers

Market isn't just riding the shift toward mindful eating – it's helping propel it.

"The health and wellness movement has a lot of momentum across the country and especially in Arizona," says Curtis Valentine, the company's chief financial officer.

Valentine points to Sprouts' dedicated Foraging team, which scouts emerging brands and trends.

"They build relationships with founder entrepreneurs ... to bring in differentiated, health-forward products that our customers love," he says.

The result is a constantly evolving mix of offerings. The company's growth trajectory is equally dynamic. Sprouts launches about 40 stores annually and will surpass 500 U.S. locations this year.

For Brandon Lombardi, chief legal officer and chief sustainability officer, that growth is closely tied to Arizona – and to ASU.

"Being a homegrown Arizona company ... we're excited about the relationship and partnership we've built [with ASU]," he says. "There are a lot of shared values ... innovation, accessibility and an entrepreneurial spirit. These are the traits embedded in our Sun Devil community, and it's why ASU talent is such a great fit for us at Sprouts."

Two-thirds of Sprouts' interns and all of its new-grad hires into the management training program in 2025 hail from ASU.

Pricing analyst Danny Mendez, '25 BS in computer information systems, says the transition to Sprouts after graduation felt natural, and he loves solving problems in a way that benefits customers.

**Awake Window & Door: Ingenuity in action**

Awake Window & Door began with a shared mindset shaped at ASU – and is now manufacturing its products in Gilbert. Three of its four co-founders – CEO Scott Gates, Chief People Officer Maria Gates and COO John Engelstad – credit the educational foundations laid at ASU with helping them build a fast-growing company, and they met at ASU.

"To find your business partner as part of your cohort, you feel very fortunate," Scott says.

Today, the company specializes in outfitting modern luxury homes across North America with products

**"Scott and I, being married, had always talked about this dream we had of building something together with a social purpose behind it."**

– MARIA GATES, CO-FOUNDER, AWAKE WINDOW & DOOR

that push the limits of size and simplicity – expansive, floor-to-ceiling glass panels that maximize views and were developed in-house by their engineering team.

Awake has a social mission too: second-chance employment for people reentering the workforce after incarceration, comprising nearly 60% of its workforce.

The company attracts Sun Devils like Neal Rabuse, '19 BS in supply chain management. Now a senior supply chain analyst, he came to Awake Window & Door and found



## **Awake Window & Door Co.**

**John Engelstad, '15 MBA, co-founder and COO; Scott Gates, '04 BS in marketing, '15 MBA, co-founder and CEO; Maria Gates, '05 BA in education, co-founder and chief people officer**

- 103 employees
- Location: Gilbert
- Years in business: 6
- Yearly revenue: \$38M



himself helping scale a company from near zero to tens of millions in revenue.

**GCON: Heart of Arizona's economic growth**

Long before they were building multimillion-dollar semiconductor facilities, Michael Godbehere and Gabriel Gavriilidis were two West Valley kids with a shared idea: start a company of their own.

They met in high school, went to Glendale Community College and transferred to ASU, where that idea took shape.

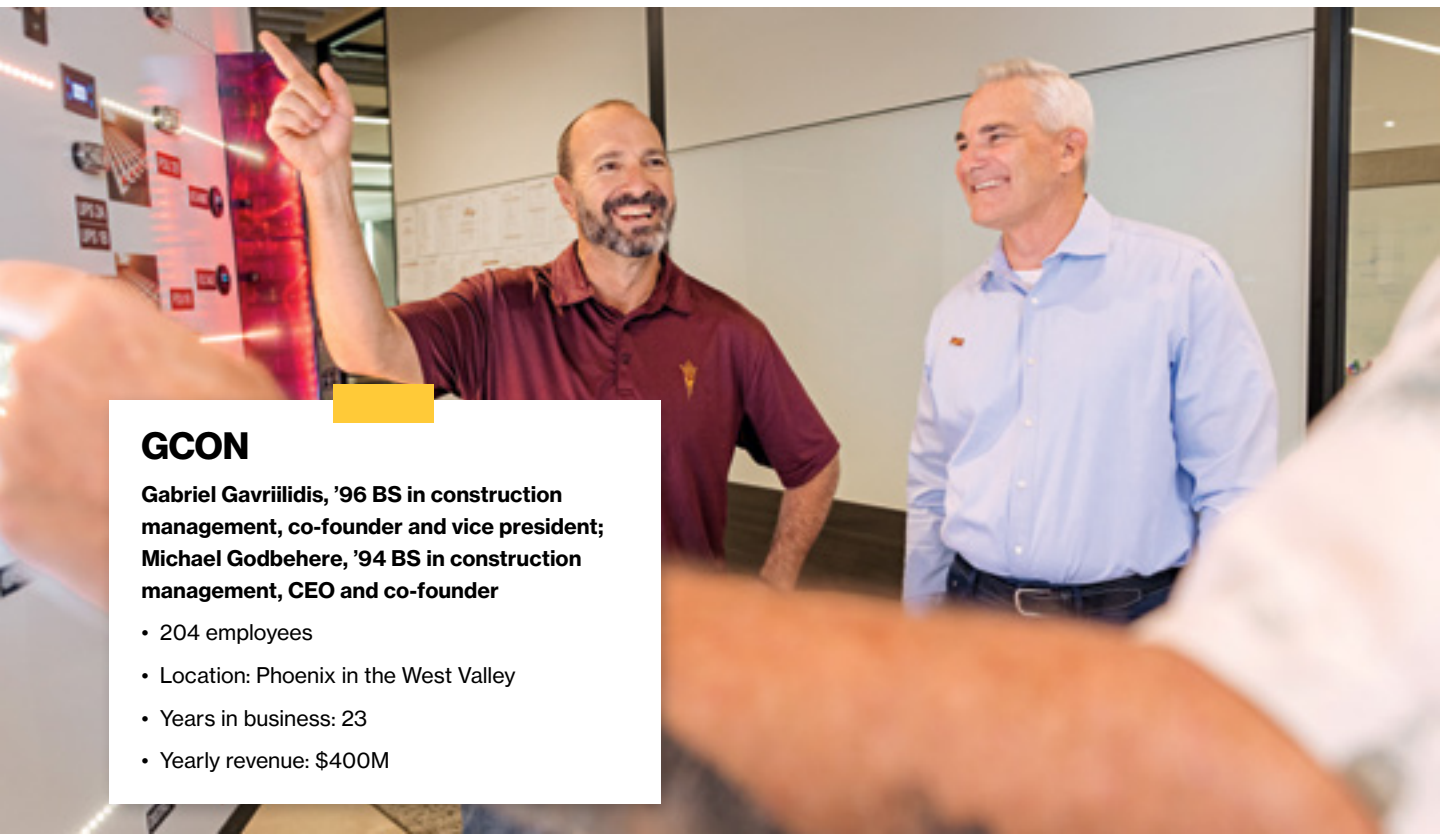
The construction program “laid the foundation for where we are now,” Gavriilidis says.

**“The easiest way to describe construction in the Arizona market right now is the tide rises all boats. And in the reindustrialization of the U.S., which is going to take another five to seven years, we have positioned ourselves to be right in the heart.”**

— MICHAEL GODBEHERE,  
CO-FOUNDER AND CEO, GCON

Their approach has fueled rapid growth – from \$70 million in revenue in 2019 to more than \$400 million today – driven in part by Arizona's booming semiconductor and data center industries. The company has become a large contractor licensed in 23 states and was recently acquired by Webcor, a California-based general contractor and its parent multinational construction company, Obayashi.

“I'm a fourth-generation Arizonan, so it's amazing over my lifetime, the differences I've seen in the state,” says Godbehere. “And the easiest way to describe construction in the Arizona market right now is the tide rises all boats. And in the



**GCON**

**Gabriel Gavriilidis, '96 BS in construction management, co-founder and vice president;**  
**Michael Godbehere, '94 BS in construction management, CEO and co-founder**

- 204 employees
- Location: Phoenix in the West Valley
- Years in business: 23
- Yearly revenue: \$400M



reindustrialization of the U.S., which is going to take another five to seven years, we have positioned ourselves to be right in the heart.”

Just down the road from where they grew up in the West Valley, GCON's headquarters reflects that philosophy. Designed by the founders, the space doubles as a community hub, hosting nonprofit boards, local organizations and even police officers stopping in to write reports.

As important as what GCON builds is who it builds. More than 50 full-time staff are ASU alumni.

They're alumni like Elijah Farrell, '18 interdisciplinary studies, who in six years has risen to the role of project manager from project engineer.

“For him [Godbehere] to take me under his wing and ... mentor me was a really cool experience,” he says.

The two founders are also working with ASU and Glendale Community College to strengthen a transfer pathway into ASU's construction program, expanding access for students.

### **azbil North America: 180-degree turnaround**

When Kenneth Gerard stepped in as CFO of azbil North America, the company's U.S. division had an accumulated loss of \$30 million. Seven years later, the company has zero debt, \$30 million accumulated gains and revenue topping out at \$55 million. The turnaround, Gerard says, came down to one principle: partnership.

The company's products are manufactured at azbil's headquarters in Japan but

## **azbil North America**

**Kenneth Gerard, '86 BS in accountancy, CFO**

- 82 employees
- Location: Phoenix
- Years in business: 30
- Yearly revenue: \$55M

then assembled in the U.S. and customized for customers. Included in the mix are industrial parts for semiconductors, control valves, transmitters and factory floor solutions.

“TSMC is a huge opportunity for us now too,” Gerard says. “Our little niche is that we also make the best sensors and best controllers.”

Gerard worked his way through college as a bookkeeper, gaining hands-on experience alongside his degree. His approach was to learn everything he could about the companies he was in and how to make them more efficient.

Throughout his career, Gerard has built internship programs that bring in ASU seniors for real-world accounting experiences before they graduate. Many have gone on to successful careers, forming a network of professionals he still mentors today.

“When you walk out the door with your diploma, you have to have something more than just a diploma,” he says. “And that approach is [why] I think ASU is a great environment.” ■

Learn more at [alumni.asu.edu/sundevil100](https://alumni.asu.edu/sundevil100).



Discover how this fast-growing region benefits from ASU's small business support and programs that prepare students for in-demand jobs

Story by AMANDA LOUDIN

# West

# Valley takes off



West Valley-based functional drink maker Sly had a problem. The company had successfully broken into the crowded beverage market and was gaining traction with retail partners. Getting to the next level of growth, however, was proving difficult, as Sly struggled to meet the fulfillment demands of potential new customers. Looking for a solution, Sly reached out to ASU's newly created SMB (small and medium-sized businesses) Lab, located on the West Valley campus, for help.

The brainchild of Dr. Amy and Dr. Tom Czyz, '92 BS in political science, who have been local optometrists for over 25 years in the Valley, Sly represents the first line of circadian beverages. The functional drinks contain natural energizers and relaxers aimed at aligning the sleep-wake cycle.

While the Czyzes were onto the right idea with their drink when they created it in 2019, they needed the expertise of the SMB Lab to help them brainstorm the right next steps.

The SMB Lab aims to help local businesses solve their biggest problems. Its target partners are businesses with revenues ranging from less than \$15 million, classified as "small," and \$15 million to \$500 million, classified as "medium," looking for help with their biggest problems.

"We recognized that after the pandemic, many small businesses were struggling," says Hitendra Chaturvedi, professor of practice in ASU's National Association of State Procurement Officials

Department of Supply Chain Management. "We have so many assets at ASU and decided that maybe we could help them."

For Sly, the SMB Lab collaboration led to the identification of a solution: The company needed to take on its own manufacturing to grow and meet demand.

"ASU created the platform for us to connect with business leaders at the Small Business Administration, and today, we're identifying the right space for manufacturing operations," Amy says.

Sly's story reflects a broader pattern of opportunity emerging from the West Valley campus. As the region grows, ASU is meeting its needs in a variety of manners – from small business assistance to supply chain expertise, unique approaches to engineering and integrated sports program support.

**"We recognized that after the pandemic, many small businesses were struggling. We have so many assets at ASU and decided that maybe we could help them."**

— HITENDRA CHATURVEDI,  
PROFESSOR OF PRACTICE IN  
THE NASPO DEPARTMENT OF  
SUPPLY CHAIN MANAGEMENT



**Devising solutions that lead to growth**

When businesses sit down to work with the SMB Lab's students and faculty, they focus on the key buckets of cost reduction, revenue enhancement and raising funds, according to Chaturvedi.

"The value proposition is fantastic," he says.

To date, 45 companies have been helped in 17 different labs, along with nearly 420 students, and 100 faculty members, providing more than \$20 million in value to these companies at no cost. Five West Valley communities, including Peoria, Avondale, Goodyear, Glendale and Phoenix, have participated.

"We're getting a good deal

**Sly founder Amy Czyz engages with students and faculty during an SMB Lab event on ASU's West Valley campus to gain insight to better operate their business.**

of traction and now have the cities coming to us asking for customized labs,” says Chaturvedi. “Even Phoenix’s city manager has asked for help and plans to visit.”

The sweet spot for partner companies is between \$1 million to \$25 million, according to Chaturvedi, many of which are veteran-, minority- or women-owned businesses, not to mention a good deal of alumni-run ventures, like Sly’s.

“We have 50 alumni involved in our business,” says Tom, “and our goal is to help students with support, mentorship and eventually, jobs.”

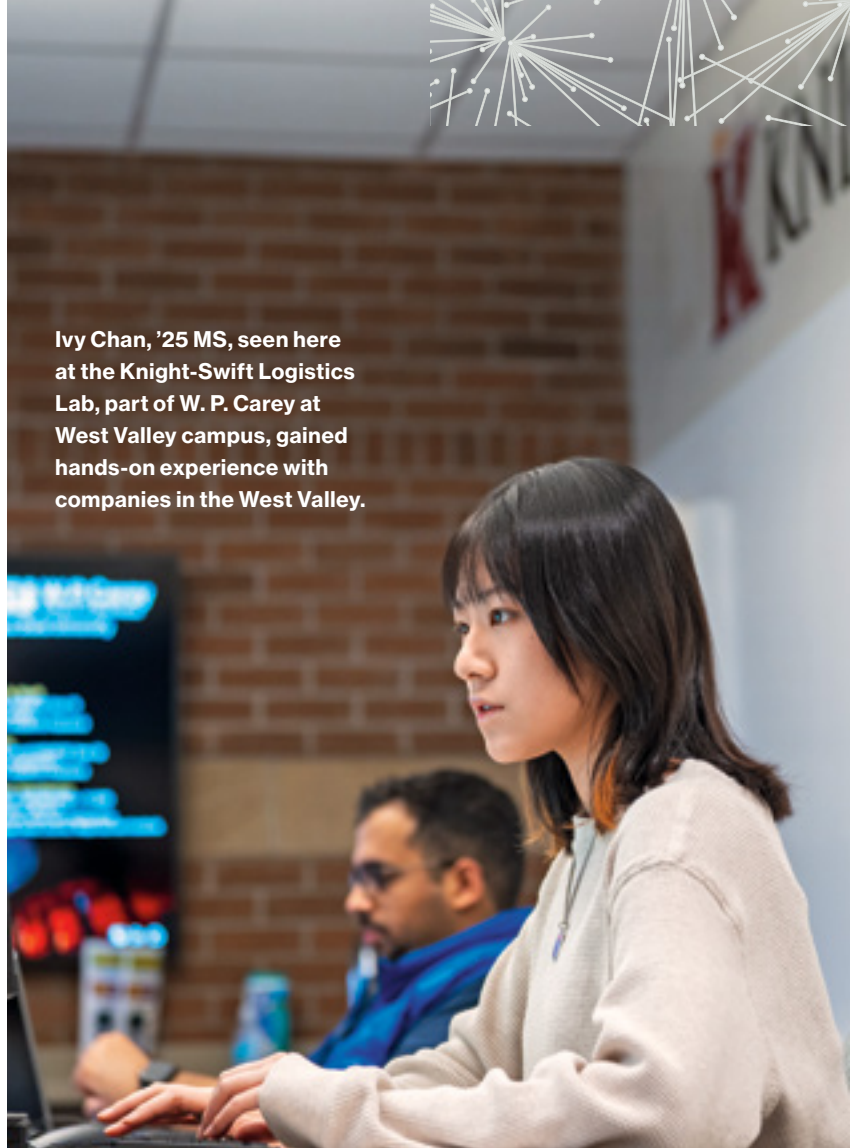
Gopalakrishnan Mohan, senior associate and dean of faculty and director of the School of Technology, Innovation and Entrepreneurship within the W. P. Carey School of Business, views it as a pillar connecting to the West Valley community.

“We provide research and insights, networking, collaboration and experiential learning for our students,” he says. “As the data comes in, we’re also building a strong database of problems and solutions. If we collect enough data, one day we may become a tool that can greatly benefit society.”

Mohan sees a future where many of the lab’s students eventually take over local small businesses as their owners age and retire.

“We’re seeing students who are taking interest in buying a business and scaling it, and that’s exciting because they will bring new mindsets to managing,” he

Ivy Chan, '25 MS, seen here at the Knight-Swift Logistics Lab, part of W. P. Carey at West Valley campus, gained hands-on experience with companies in the West Valley.



says. “The impacts of the lab will be far-reaching in the coming decades.”

### **Preparing tomorrow’s workforce for the West Valley’s needs**

Complementing and collaborating with the SMB Lab is the new School of Integrated Engineering, which welcomed its first class of students in 2024. Students in this school can earn a BS in engineering science (business) or a BS in engineering science (microelectronics). The West Valley is a hub for technology startups and innovation, so the school is a perfect partner for workplace and economic

development.

“Problems rarely sit within a single domain, so you have to work across disciplines and communities, which is where our programs come in,” says Shawn Jordan, interim director of the school. “We work across the West Valley campus ecosystem to produce graduates with the skills needed in the West Valley.”

One example of this is the microelectronics degree track, which was created specifically to support the region’s rapidly growing semiconductor industry.

“We merged parts of an undergraduate electrical engineering degree most relevant



to the semiconductor industry with additional industry practice-focused and advanced content,” says Jordan. “The faculty includes a professor of practice who spent 25 years at Intel, and then we have a teaching professor with a semiconductor background.”

While the programs are still young, the integrated engineering students are already gaining experiential learning from local companies like Banner Health, Intel, TSMC and Southwest Airlines, and this summer, many are participating in internships in the West Valley.

They are also integrated into the SMB Lab.

“Several of the problems local businesses have are technology-related,” says Jordan. “Our junior-level engineering science (business) students are working with SMB teams to help design AI-based solutions for these companies.”

### Mastering the supply chain

All businesses depend on the supply chain, but many struggle with their supply chain management. In the West Valley, that’s where ASU’s new Master of Science in Supply Chain Management degree comes into play. Supported by the W. P. Carey School of Business, the program provides students with the skills they need to optimize supply chain operations.

It’s a perfect complement to the West Valley, says Brett Duarte, clinical associate professor in the NASPO Department of Supply Chain Management.

“The West Valley is a huge logistics and warehousing corridor. We’re a proponent of experiential

**“The West Valley is a huge logistics and warehousing corridor. We’re a proponent of experiential learning and we’ve partnered with several companies to give our students that opportunity.”**

— BRETT DUARTE, CLINICAL ASSOCIATE PROFESSOR IN THE NASPO DEPARTMENT OF SUPPLY CHAIN MANAGEMENT

learning and we’ve partnered with several companies to give our students that opportunity.”

Ivy Chan, ’25 MS in supply chain management, is a good example of this. While at ASU, Chan visited a local company, meeting the CEO and learning how the company worked. There, she discovered that supply chain management often involves working with incomplete or imperfect data, creating a challenge for professionals. Chan also took advantage of related case competitions, industry speaker events and business clubs — something she encourages future students to try, too.

The West Valley is also home to numerous health care companies, affording the master’s students a host of learning opportunities.

“We built a strong partnership with HonorHealth, collecting data and helping them optimize their inventory in multiple locations across

the Valley,” Duarte says.

Students have also completed capstone projects — similar to internships — with a variety of West Valley businesses, often leading to full-time work upon graduation. Grocery chain Albertson’s, Microsoft, DSV and MornstAir Inc. are examples of this symbiotic relationship. And when the SMB Lab has a problem where the supply chain management students can help, they become part of that team, too.

### Prepping students to help the West Valley’s growing athlete population

Athletes like ASU alumni Cam Skattebo, ’24 BA, Jon Rahm, ’16 BA, Phil Mickelson, ’92 BA and Briann January, ’10 BA, have all been open about the fact that their prowess is more than physical — it also includes a mental edge. To get it, they’ve all turned to sports psychologists, whether to solve a problem or hone their “mental toughness” against the competition.

Now thanks to ASU West Valley’s new Master of Science in psychology with a concentration in sport psychology, the West Valley’s vast network of athletes and sports teams can perfect their mental game, too.

Serving as a bridge between psychology and kinesiology, the new program — which features small class sizes — allows for close mentorship between faculty and students. Many of the students have a shared history of athletic participation, and they bring a passion for all aspects of sport to the classroom and out into the field.

“We’re able to leverage our



**Riko Takayoshi, a fourth-year global management student, and Ashley Rodarte, a second-year sport psychology student.**

interdisciplinary programs to meet the needs of the sports community,” says Todd Sandrin, vice provost at ASU West Valley and dean of the New College of Interdisciplinary Arts and Sciences.

Some of the sport psychology students have had hands-on practice with the ASU Women’s Club Rugby team, and Sandrin says the goal is to eventually “be on speed dial” for the West Valley. The first cohort of students began in fall of 2025, so they’re just beginning to get that foothold, but ASU is exploring ways to establish West Valley partnerships, according to Heather Smith-Cannoy, director of the School of Social and Behavioral Sciences.

“Faculty are working to engage

with the local community to advise and disseminate best practices for parents of young athletes, to advise and support development of youth sports programs, and to help with coaching in youth sports,” says Lindsey Mean, associate professor in the School of Social and Behavioral Sciences. “We believe students graduating will bring valued knowledge and practices to benefit a variety of sports-related and community contexts.”

It’s all part of ASU’s move to establish a “sports nexus” in the region, which brings together sports psychology, sports management and eventually, sports journalism. That’s important as the West Valley continues to grow as a sports

mecca, hosting Super Bowls, NCAA Final Four championships and more.

“Just southwest of here, we have State Farm Stadium, and for baseball, we’re the spring training capital,” Sandrin says.

The 2025 spring training season generated an estimated \$764 million in economic impact for Arizona alone, according to a study by the W. P. Carey School of Business.

ASU’s campus is uniquely poised to support and grow the West Valley’s bright future.

“It’s not just about the West Valley community – it’s about us being of that community,” Sandrin says. ■

**Learn more at [campus.asu.edu/west-valley](https://campus.asu.edu/west-valley).**



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**Mark McKenna**  
Founder, Mirador  
Therapeutics,  
San Diego

# Golden State innovat ASU roots

# tion

From billion-dollar biotech deals to award-winning wines, these ASU alumni are shaping California's future

Story by ED LEIBOWITZ



For ASU graduates, California has long been a place to build careers — and scale them. From the Bay Area to San Diego, Sun Devils are shaping industries across the state. Here are three alumni making an outsized impact.

### Mark McKenna and a \$10.8 billion breakthrough

One evening in 2023, four private Gulfstream jets lay idle at San Diego International Airport, each containing a pharmaceutical executive waiting to take Mark McKenna, '02 BS in marketing, to dinner and talk about acquiring his company.

Four and a half years earlier, McKenna had been named CEO of Prometheus Biosciences, which was developing a personalized therapy for inflammatory bowel disease based on patients' genetic profiles. Merck Inc. ultimately acquired the company for \$10.8 billion. Jetliners began playing a pivotal role in McKenna's career at its earliest stages.

"I originally went to ASU to study aeronautical engineering," McKenna says, "and realized that that field was more of a hobby for me."

Flying back home to California during Thanksgiving break, the ASU first-year student was introduced to a more promising way forward. "I had a chance encounter with a

guy who worked for Johnson & Johnson," McKenna recalls, "and he said, 'Hey, why are you focusing on airplanes? You should be in business. Here's my card. Call me when you get done.'"

McKenna switched his major to marketing, and when he graduated from ASU, began work in sales and marketing at Johnson & Johnson, then moved on to Bausch + Lomb. A decade later, he ended up running all U.S. business for the optical company.

While at ASU, McKenna also met his partner in life. Like her future husband, Sheri Andrews, '02 BS in marketing and BS in finance, was a first-year student at ASU's W. P. Carey School of Business.

Last spring, Mark and Sheri were back on campus when the W. P. Carey School and The College of Liberal Arts and Sciences announced the establishment of the McKenna Life Sciences, Business and Entrepreneurship Program,

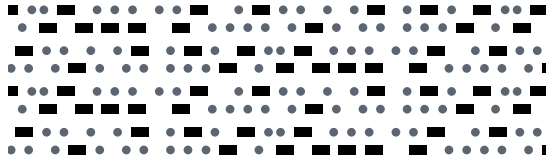
launched with generous funding by the couple.

"There's a gap that exists in academia in terms of developing life science leaders that are ambidextrous," McKenna says. "There is no playbook to start a business, but it is critical to have the

financial acumen along with the science side to be successful."

The McKenna program is designed to teach graduates in the sciences how to raise capital, run a profit or loss statement, and understand all the other elements that go into actually running a

Learn more about the McKenna Life Sciences, Business and Entrepreneurship Program at [mckenna.asu.edu](https://mckenna.asu.edu).



**“Our aim is that, say, 10 years from now, some of the best entrepreneurs in the biotech sector are going to come from this program at ASU.”**

— MARK MCKENNA, FOUNDER, MIRADOR THERAPEUTICS

successful business.

“Our aim is that, say, 10 years from now, some of the best entrepreneurs in the biotech sector are going to come from this program at ASU,” McKenna says.

In 2024, McKenna launched San Diego-based Mirador Therapeutics. Like Prometheus, the new company will again draw on each patient’s genetic information to more effectively target the sources of their suffering, in this case,

the immune reactions that cause inflammation and fibrotic diseases.

At Mirador, McKenna is intent on building another successful company, but he says his prime focus is on the ultimate beneficiaries of his products.

“If you think about the impact of some of the treatments that we’re developing now,” McKenna says, “we are the best hope for these patients to avoid the hospital, to avoid debilitation and in some cases, even to avoid death. For me, I’m in the ideal profession because you can do well, but you do well by doing good.”

**Sean and Nicole Minor and their California vines**

Well before Sean Minor and Nicole Fregosi graduated from ASU, it became apparent that wine would play a central role in their shared future. Nicole comes from a large Italian American family where delicious wine is often part of a nice dinner.

Four decades later, Sean, '88 BS in finance, and Nicole, '89 BA in communication studies, are the proprietors of Sonoma-based Sean Minor Wines, whose product is distributed in all 50 states.

By the time the Minors launched their winemaking operations in 2005, the price for a very good

bottle of California cabernet had been climbing steadily toward \$50 a bottle. The couple aimed to make affordable vintages with a taste and feel well above their modest price points.

“For the second year in a row, all 12 of our wines have been rated 90 or above by the leading reviewers,” Sean says, “and they range anywhere from \$15 to the upper \$20s.”

Today, their daughter, Elle Minor, has also joined the team as a winemaker. Nicole says that she has her own ideas for the company, such as fermenting sauvignon blanc in amphorae – clay vessels often used for storing wine in ancient Greece.

“It offers different nuances to the wine, and she’s not afraid to do that, which is great,” Nicole says.

At ASU, Sean studied finance. To prepare himself for his life’s work, he also spent time in the vineyards of a Napa winemaker.

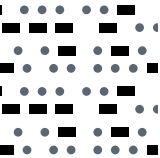
Nicole leveraged her BA in communication from The College of Liberal Arts and Sciences to shape the public profile of Sean Minor Wines through traditional media, and perhaps more crucially, online. She took on all social media duties, the label design and the marketing side of things.

“I specifically answer all our direct messaging, and I answer every message that’s on our social media platform,” she says. “I want it to come from me, not from someone I’ve hired, who wasn’t part of what I know Sean and I created from the very beginning.”

In addition to all those 90-and-over raves by the reviewers,



**Sean and Nicole Minor**  
Founders,  
Sean Minor Wines,  
Sonoma Valley



the Minors' wines have earned what, for its founders, may be the most important validation of all.

"It's worked out well, because actually our sauvignon blanc is [my mom's] favorite," says Nicole.

### Daphne Poerio's systemwide thinking and frontline impact

As a medical assistant at an urgent care clinic in San Francisco, Daphne Poerio, '23 BS in community health and '25 Master of Healthcare Innovation, wasn't assigned to review patient testing protocols. However, after noticing gaps in pregnancy, strep throat and blood pressure screening, she stepped in. Her self-initiated audit led to changes in staff training and clinic procedures, reducing errors and improving patient safety.

Poerio brings a broader perspective to the role. She now applies training from both her bachelor's and master's programs on the front lines of patient care.

"Having both of those degrees has given me a broader perspective on patient care," she says, "and it allows me to better understand the complexities of the organization – and to see how it all relates to us on the floor."

She adds: "My manager at the time was very supportive. I didn't have to convince them – rather, they were impressed that I was taking initiative to ensure accuracy and quality in our testing processes. The data I presented from those audits was used to improve staff training and refine our protocols,

### Daphne Poerio

Medical assistant,  
Palo Alto  
Medical Foundation,  
San Francisco



which ultimately helped reduce errors and improved patient safety."

One of the reasons Poerio chose ASU for her undergraduate and master's degrees is the university's outreach to Indigenous students like herself. At the Edson College of Nursing and Health Innovation, she found a course of study whose dynamic approach to health care matched her own.

"The program focused on evidence-based practices, but also innovation and systems-level problem solving," she recalls. "It helped me look at processes and procedures critically, and to not just follow standard procedures for their own sake, but to ask why we do them and whether they truly serve patients."

She also benefits from ASU's California health care mentorship program, where she was paired with a mentor in California who also is an ASU alumna.

From her ground-level perspective, Poerio has had the

opportunity to analyze clinic workflows, patient education and communication among staff.

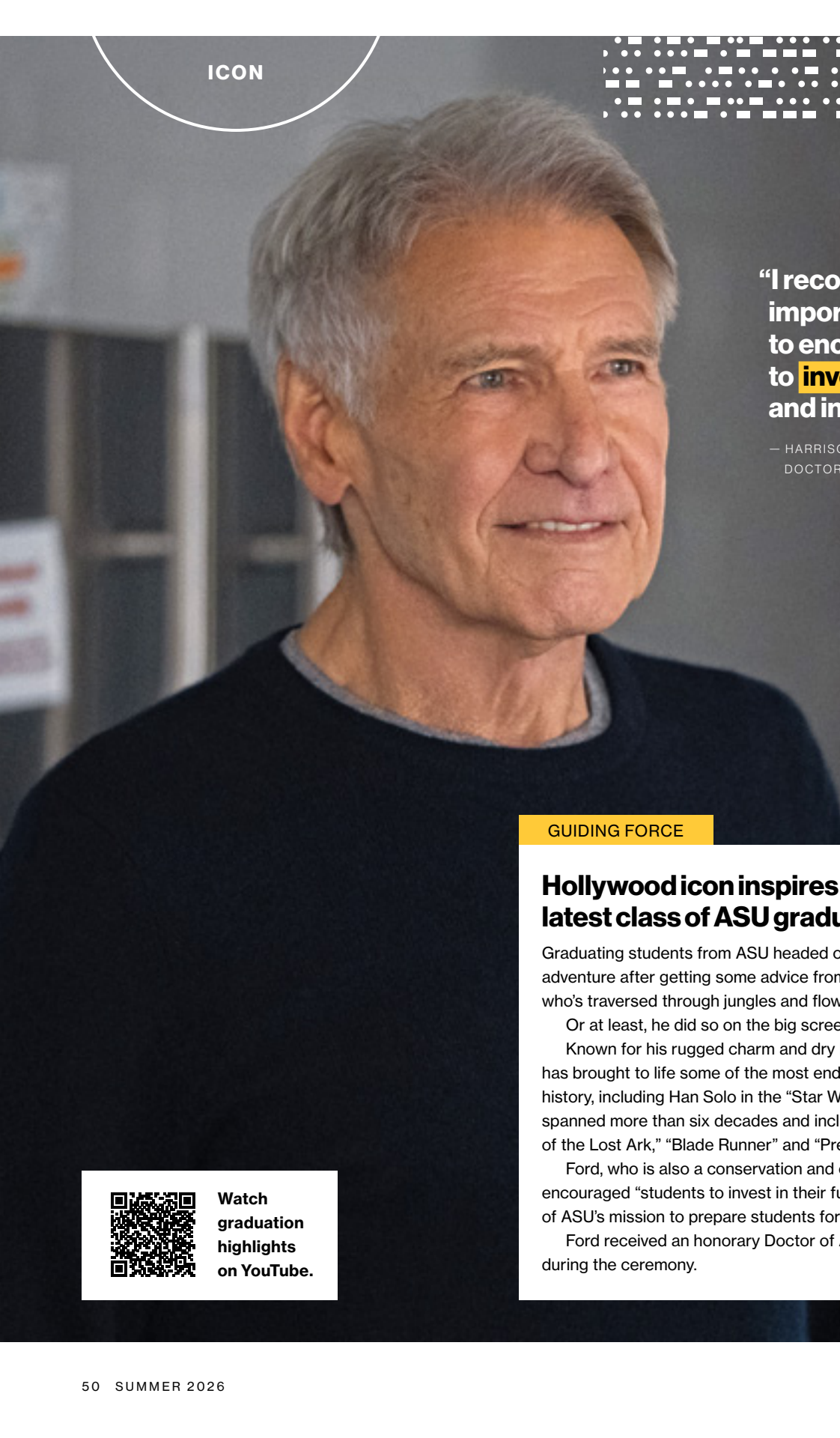
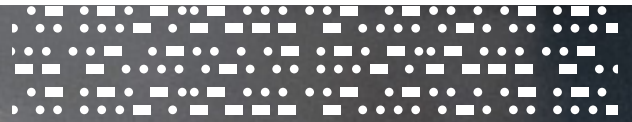
"I've been able to identify bottlenecks and areas where patient care could be more efficient or more patient-centered," she says. "That mindset has allowed me to propose and implement practical improvements that make a real difference on the ground level."

### One foundation, many paths

From billion-dollar breakthroughs to small, daily improvements in patient care, the scale may differ, but the throughline is the same. Across California, ASU alumni are turning education into impact. ■

**Learn why Californians are sending their children to ASU:**  
[california.asu.edu](https://california.asu.edu).

**Submit your story for consideration:** [alumni.asu.edu/alumni-stories/](https://alumni.asu.edu/alumni-stories/)  
[share-your-sun-devil-story](https://share-your-sun-devil-story.com).



**“I recognize this is an important opportunity to encourage ... students to **invest in their futures and in nature.**”**

— HARRISON FORD, ACTOR, HONORARY DOCTOR OF ARTS AND HUMANE LETTERS

GUIDING FORCE

**Hollywood icon inspires the latest class of ASU graduates**

Graduating students from ASU headed out on their next great adventure after getting some advice from a commencement speaker who’s traversed through jungles and flown in a galaxy far, far away.

Or at least, he did so on the big screen.

Known for his rugged charm and dry humor, Harrison Ford has brought to life some of the most enduring characters in film history, including Han Solo in the “Star Wars” movies. His career has spanned more than six decades and includes the hit movies “Raiders of the Lost Ark,” “Blade Runner” and “Presumed Innocent.”

Ford, who is also a conservation and environmental advocate, encouraged “students to invest in their futures and in nature” as part of ASU’s mission to prepare students for life after graduation.

Ford received an honorary Doctor of Arts and Humane Letters during the ceremony.



Watch graduation highlights on YouTube.



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## HISTORY

**An ASU researcher works at a terminal with floppy disks and printed output.**

**ASU researchers use an IBM personal computer system in 1984, when desktop computing first supported the development of AI.**





# Nearly 50 years of AI at ASU

Before it became a household name, researchers at ASU were building the foundations of artificial intelligence as we know it today



Story by ELLEN SHENG

When Professor Subbarao Kambhampati started working in the field of artificial intelligence in 1983, his friends and colleagues felt sorry for him.

People asked, “Why can’t you do something more useful, such as databases, such as software engineering?” he recalls. At the time, “AI was an intellectual discipline that didn’t yet have perceivable benefits right away.”

Fast-forward nearly 50 years, and AI has become one of the biggest games in town. But the transformation didn’t happen overnight. Since the term AI was coined at a 1956 conference, sometimes called the “Constitutional Convention of AI,” the field has lurched between hype and “AI winters” when both funding and interest collapsed.



Throughout those ups and downs, researchers at ASU's computer science department, which was founded in 1980, and even before it was a department that has now become part of the School of Computing and Augmented Intelligence, have been steadily working on the fundamentals of AI: teaching a machine to absorb knowledge, make plans and move closer to human intelligence – long before its commercial value became obvious.

“We are on the front line,” says Regents Professor Huan Liu.

### Fixing AI errors

In 1986, as a 20-year-old at a university in West Bengal, Professor Chitta Baral found his calling in a quest to teach computers to think.

“We humans make decisions on incomplete information,” Baral says, “and when we are given new knowledge, we are OK to change our minds.”

This is why using mathematical logic as the framework proves brittle – because human reasoning is flexible.

Reasoning this way can cause mistakes because machines lack underlying world models. To solve this problem, Baral spent decades developing a “knowledge calculus,” a new reasoning methodology that allows machines to update understanding when receiving new information.

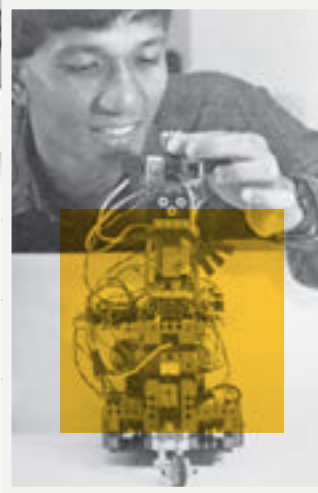
That work, which continued after he joined ASU in 1999, is now recognized as foundational to one of AI's central unsolved problems, and for helping solve it in certain situations. Current large language models may be fluent in English, but, at times, they still make world model errors, confidently producing answers that ignore basic facts about how things work.

While ChatGPT or Claude can give these human-like answers that sound authoritative, as discussed in AI circles, some models sometimes make amusing mistakes. In one example, Baral recalls hearing a system suggest someone walk 200 meters to the car wash instead of drive because it's so close anyway.

In 2021, in collaboration with

**Top: A discussion unfolds beside ASU's Univac system in 1976, when large-scale machines and magnetic tape defined computing.**

**In 1992, now-Professor Chitta Baral assembles an early AI-enabled robotic prototype.**



**“We are on the front line.”**

— HUAN LIU, REGENTS PROFESSOR IN THE SCHOOL OF COMPUTING AND AUGMENTED INTELLIGENCE



**Professor Huan Liu (center) works with students in his lab in 2019. Liu is a global leader in social media data mining research.**

researchers at the Allen Institute for AI, Baral and his ASU doctoral student Swaroop Mishra, '23 PhD in computer engineering (computer systems), now at Microsoft, formerly at Google DeepMind, published one of the earliest papers demonstrating that large language models could be trained to follow human instructions, a technique now called instruction tuning. OpenAI later scaled this approach into ChatGPT.

### **Teaching machines to identify relevant data**

These days, Professor Huan Liu is best known as a pioneer in social media data mining, which finds trends in massive social media databases. But when he started the early phases of AI and machine learning in the 1990s, the landscape looked very different.

Research experimental work

was done on desktop computers and researchers relied on small, well-curated datasets – like the Iris dataset, which was just 150 rows and four columns describing three varieties of flower – to develop and validate new algorithms.

There were no textbooks. Instead, Liu compiled his own course materials from research papers.

The constraints didn't dampen his enthusiasm. In an emerging field like he was helping to create, he noted, there's a freedom not possible in established disciplines.

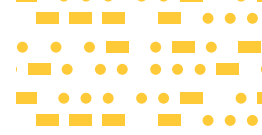
"There were a lot of ideas you could pursue," he says, "instead of having to follow previous researchers."

As the data grew from 150-row datasets to millions of data points, the question of what to pay attention to became urgent. Liu's contribution is feature selection,

which teaches machines to identify what information actually matters for a given task and what doesn't. Without it, models either drown in irrelevant data or become confused and inefficient.

He helped build workable mathematical foundations for how AI systems learn to focus, developing methods now embedded in how machines process language, behavior and social interaction. The methods he developed for finding patterns in noisy, human-generated data helped lay the groundwork for how AI systems now interpret human communication and behavior.

He has graduated 47 PhD students at ASU thus far, many of whom carried these methods into the next generation of AI research at leading companies such as General Dynamics Information Technology, Google, Microsoft and LinkedIn.



## ASU students are learning AI and transforming industries

Across campus and across degree programs throughout the university, students and researchers are using AI to reimagine their fields:

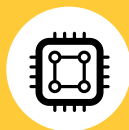
- **Accelerating medical discovery**

by using AI to analyze large sets of biological data and identify protein targets linked to side effects in cancer treatments



- **Making roads safer** by training

AI systems in simulation and testing them on physical models to improve how technologies like traffic control and self-driving cars perform in real-world conditions



- **Using AI to analyze digital evidence** and uncover patterns

that help investigators track cybercriminal activity and respond more effectively



- **Enabling students to create an “agentic self”** – an AI persona reflecting their values, voice and goals – through a class taught by musician and innovator will.i.am on the EDU.FYI platform, a collaboration between ASU and FYI.AI



In addition, ASU offers a variety of flexible undergraduate and graduate degrees, including a doctoral degree in artificial intelligence for the next generation of leaders and innovators.

Learn more at [ai.asu.edu](https://ai.asu.edu).

### Helping AI plan

The Grand Canyon, with its cliffs and intense summer heat, could be deadly, but most people who visit survive because they avoid walking along the edges, study trail maps and bring water.

“People don’t just show up, close their eyes and wander around,” says Kambhampati, who arrived at ASU in 1991 but started in AI in 1983 with his undergraduate thesis. “But in essence, that’s what computers do.”

Teaching machines to navigate the world, a critical skill for AI to work, has been Kambhampati’s mission.

His focus is automated planning, ensuring an intelligent agent doesn’t “step on its own toes” or make a mistake from which it cannot recover, like a Mars rover falling into a ditch.

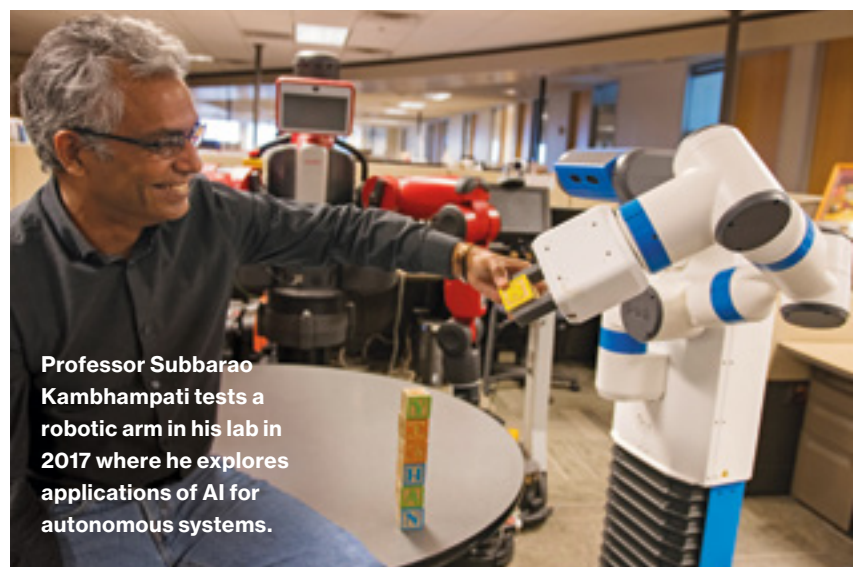
“Planning is needed to make sure that even though the world is unforgiving, you can still live in it without catastrophe,” he says.

While today’s large language models draft everything from travel itineraries to wedding plans, Kambhampati’s research proved that today’s models still often make errors in planning because they lack underlying reasoning capabilities.

In one well-known experiment, Mystery Blocks World, he simply renamed the objects in a test. AI models that were working well suddenly collapsed to near-zero accuracy, revealing they had been pattern-matching against training data rather than reasoning.

“They will give you a great wedding plan,” he says, “but they will likely miss the critical logistics, like having a caterer in place.”

To bridge this gap, starting in 2022, he developed the LLM-Modulo framework. AI-generated plans are run through an external “verifier” to catch errors before any action is taken. It’s much like a student checking answers against the back of a textbook.



**Professor Subbarao Kambhampati tests a robotic arm in his lab in 2017 where he explores applications of AI for autonomous systems.**



This process of ensuring agents act safely in a world of irreversible consequences is what the field now calls AI safety, a discipline Kambhampati was defining decades before the term became a buzzword.

### From the lab to real world

Meanwhile, Ross Maciejewski, the current director of the School of Computing and Augmented Intelligence, starting back in the 2000s, focused on a different challenge: how to make the mountains of data useful for the people responsible for public safety.

Beginning in the mid-2000s, he worked with the Department of Homeland Security to analyze emergency room records. Every 12 hours, a new batch of records would come in and needed to be analyzed for anomalies or signs of potential disease outbreaks. In one memorable instance, his team's system flagged a cluster of patients from a single address complaining of headaches. They eventually discovered a carbon monoxide leak in the apartment building.

"Given the volume of records, you're not going to do that manually. So, we would think about how to use novel AI techniques and build new AI techniques to support the support systems," Maciejewski says.

He built on that early work and applied game theory to defense, helping the Coast Guard and Transportation Security Administration develop randomized patrol routes to make it harder for contraband to slip through ports and airports.



**Professor Ross Maciejewski developing AI applications for public safety in his lab in 2018.**

Today, his research centers on human-AI teaming, studying how humans, such as airport security officers, should interact with AI alerts. How much should they trust a machine's suggestion, and how do we ensure humans remain responsible for the final, high-risk decisions? His work helps ensure that as AI grows more powerful, it remains a tool that enhances human judgment, rather than replacing it.

### The long game

ASU's researchers have kept working in the field when it was unfashionable and there were no textbooks. For these faculty, the explosive popularity of AI today is the latest chapter in a long pursuit of discovery that predates hype and sets the stage for what AI can do today and tomorrow.

**“There are only three fundamental questions facing humanity: the origin of the universe, the origin of life and the nature of intelligence. AI tries to have something to do with the last part. ... So, how could you not be interested?”**

— SUBBARAO KAMBHAMPATI, PROFESSOR IN THE SCHOOL OF COMPUTING AND AUGMENTED INTELLIGENCE

For Kambhampati, who has been at ASU the longest, the work was never about technology.

“There are only really three fundamental questions facing humanity: the origin of the universe, the origin of life and the nature of intelligence. AI tries to have something to do with the last part, the nature of intelligence. So, how can you not be interested?” ■

Learn more at [scai.engineering.asu.edu](https://scai.engineering.asu.edu).

A high-angle photograph of a massive crowd of students, predominantly wearing yellow shirts, filling a stadium section. The students are densely packed and appear to be cheering or celebrating. In the foreground, a grey platform features the logo for 'GILA RIVER RESORTS & CASINOS'. Above the crowd, several banners are visible, including one for 'SHAMROCK FARMS - ROCKIN' PROTEIN', another for 'YOU DO YOU', and a large black banner on the right that reads 'CONFERENCE CHAMPIONS' followed by a list of years: 1931, 1939, 1940, 1952, 1957, 1959, 1961, 1969, 1972, 1973, 1996, and 2007. The word 'Sports' is overlaid in large white letters across the top of the image.

# Sports

The record-setting student section at the 2025 ASU home opener vs. NAU.



A THUNDEROUS ROAR

## Sun Devils dominate with unstoppable fan support

The energy at Mountain America Stadium in 2025 was electric. Sun Devil Football sold out all seven home games, the first full-season sellout in program history.

The Inferno, our legendary student section, set a record with 14,280 students at a single game; it earned Big 12 Student Section of the Week twice.

Be there for the kickoff this fall when the Sun Devils host the Morgan State Bears on Saturday, Sept. 5.

**Don't wait – lock in your seats at [sundevis.com/tickets](https://sundevis.com/tickets).**

# Four gold medals and a degree from ASU

**Léon Marchand returned to ASU to get his degree in computer science**

Story by SCOTT BORDOW, '98 BA

**When Léon Marchand returned to ASU's Tempe campus for his Dec. 15 graduation ceremony last winter, he had one stop he was determined to make.**

"Postino's," Marchand says, referencing the Postino Annex restaurant, located on College Avenue. "That was our place as swimmers because it's right next to the pool [at the Mona Plummer Aquatic Center]."

"I have really good memories about having those dual meets on Saturday and then going there with all the swimming parents and being all together.

That was really special. So, I'll definitely go there."

If Marchand's name sounds familiar, well, it should. He won four gold medals — the 200-meter medley, the 200-meter backstroke, the 200-meter butterfly and the 400-meter medley — at the 2024 Summer Olympics. He became just the third male swimmer in Olympic history — Michael Phelps and Mark Spitz being the others — to win four individual gold medals at a single Games. And he did it in his native country of France.

"It was a once-in-a-lifetime kind of thing, and I was aware of it at the time,"

Marchand says. "I remember being on the podium and being like, 'OK, this is going to happen only once. Please enjoy it.'"

As Marchand celebrated in the pool after winning his fourth gold medal, he displayed the "Forks Up" sign, making sure the world knew that he was a Sun Devil, having won 10 NCAA titles in three years at ASU and leading the Sun Devils to the 2024 NCAA title.

"I think it was a way of giving back," he says. "ASU brought me so much in terms of swimming, but also in terms of what I was doing in school, the people



**“ASU brought me so much in terms of swimming, but also in terms of what I was doing in school.”**

— LÉON MARCHAND, '25 BS,  
OLYMPIC FOUR-TIME  
GOLD MEDALIST

**Swimmer Léon Marchand, '25 BS in computer science, earned his degree through ASU Online, allowing him to balance his studies with his Olympic goals.**

I met and the experiences I had. The 'Forks' were something I was proud of showing to other people.”

Once the Olympics concluded, Marchand, 23, knew there was another challenge he needed to conquer – getting his degree from ASU. And he did so in December, receiving a Bachelor of Science degree in computer science through the School of Computing and Augmented Intelligence and ASU Online.

“I always needed a balance in my life,” Marchand says. “Swimming takes a lot of energy and a lot of time. But I also love to learn things. I didn’t want to just

be a swimmer. I wanted to keep my mind active, still think about stuff, learn about things outside of the swimming pool.

“And you can’t really swim [at an elite level] when you’re more than 30 years old. So, I wanted to prepare my professional career as well. That’s why I came back to ASU.”

Marchand credits ASU Online for giving him the flexibility he needed to complete his degree. He says he travels every two to three weeks, making it nearly impossible to do in-person classes.

Marchand is leaving ASU with a few

lessons learned – don’t be afraid to take a different path, do your work a little at a time rather than waiting until the last minute – but what he’ll remember most, what he’ll treasure most, are the people from different cultures he met along the way.

“It was really awesome to see the whole world in the same class,” he says. “It’s not just Americans. I loved that about ASU.” ■

**Check out ASU’s Olympians at [thesundevis.com/honors-awards/olympians](https://thesundevis.com/honors-awards/olympians).**



**“It’s full circle for me. I get to go back to the Los Angeles Olympics for a second time, and now I get to go back and deliver the equipment.”**

— MIKAEL ÖRN, FORMER SWIMMER WHO COMPETED AT THE 1984 OLYMPICS WHILE A STUDENT-ATHLETE AT ASU

THEN AND NOW

### Sun Devil Olympian to return to the Olympic Village in 2028

In 1984, Mikael Örn, '85 BSE in computer systems engineering and '87 MS in computer science, stood on a podium in Los Angeles, bronze medal at his chest, the water behind him still rippling. He will return to the same city for the 2028 Olympic Games to help engineer the water conditions.

Örn is supplying his company's competition-grade lane lines. Perfected in his native Sweden, they dampen energy created by waves swimmers make – effectively giving them “faster water,” he says.

Learn more at [news.asu.edu/orn-olympics](https://news.asu.edu/orn-olympics).



At ASU, Mikael Örn was the 1983 NCAA champion in the 200-yard freestyle, a two-time Academic All-American and 1984 Athlete of the Year.



## Sun Devil Women's Basketball becomes a powerhouse

Sun Devil Women's Basketball returned to the NCAA Tournament for the first time since 2019 under first-year Head Coach Molly Miller. Miller helped the Sun Devils flip the script from last season's 10-22 record to this year's 24-10 record, which included a historic 15-0 start and a 15-game win streak. With dominant nonconference play and a 15-2 mark at Desert Financial Arena, which will see significant renovations this summer, the season signaled more than a turnaround. It's the foundation of a rising powerhouse, and Miller is confident the NCAA Tournament will become a yearly appearance.

Learn more at [sundevils.com/sports/womens/basketball](https://sundevils.com/sports/womens/basketball).



## Football headed to London

The Union Jack Classic will bring Big 12 Football to the iconic Wembley Stadium in the United Kingdom in September when the Sun Devils take on the Kansas Jayhawks in front of 90,000 fans.

Game week will also feature events at ASU London, a new U.K.-accredited higher educational institution with several degree offerings. The programs combine a three-year U.K. bachelor's degree with a one-year accelerated master's degree from ASU.

Get tickets at [sundevils.com/sports/mens/football](https://sundevils.com/sports/mens/football).



## Sun Devil Wrestlers build their business

Between early-morning lifts and late-night study sessions, Sun Devil wrestlers and roommates Jacob Meissner and Carter Dibert, '25 BS in finance, are growing their construction company, Landmark Siteworks, which is already landing residential, commercial and government contracts back in Meissner's home of Maple Grove, Minnesota.

Learn more at [sundevils.com/sports/mens/wrestling](https://sundevils.com/sports/mens/wrestling).



## EXPERIENCE

**“Herberger Institute Day is always really inspiring. It means a lot to see the community come together, and I get a great sense of the opportunities available outside of my classes.”**

— ALIYA CARREON-CZEGLEDI, UNDERGRADUATE  
DANCE EDUCATION STUDENT

### CREATIVE SCENE

## A community design and arts festival

Music drifting across the plaza, hands covered in clay, strangers turning into collaborators. That was the atmosphere experienced by students like Aliya Carreon-Czegledi, a dance education major who attended Herberger Institute Day.

The annual event brings together the students, faculty and staff of the Herberger Institute for Design and the Arts’ schools and art museum for a day of creative exploration and conversation.

Featured interactive activities included charm making and clay sculpture, drop-in classes on industrial design and live performances by student musicians.

Learn more at [herbergerinstitute.asu.edu/day](https://herbergerinstitute.asu.edu/day).

Aliya Carreon-Czegledi worked on a community clay art piece that will be kilned and displayed at the School of Art.



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Hello, I'm Elizabeth W.

Barrett Honors grad  
Registered Nurse in the  
Neonatal Intensive Care Unit  
Phoenix Children's Hospital  
25 BS in nursing

The ASU logo is a purple circle containing the letters "ASU" in a stylized, bold, purple font. The "A" and "S" are connected, and the "U" is separate. A small registered trademark symbol (®) is located to the upper right of the "U".