

# UAH Magazine

A PUBLICATION OF THE UNIVERSITY OF ALABAMA IN HUNTSVILLE

## BUILT FOR WHAT'S NEXT

Hands-on learning, competitive excellence and campus growth are positioning UAH students to lead

### ACADEMICS

UAH SET TO TRANSFORM DIGITAL ENGINEERING EDUCATION AS A DASSAULT SYSTÈMES 3DEXPERIENCE EDU CENTER OF EXCELLENCE

### RESEARCH

UAH EARNED ITS FIRST DARPA CONTRACT IN BIOLOGICAL SCIENCES, SUPPORTING BREAKTHROUGH CATALYST RESEARCH

### CAMPUS

SPRAGINS HALL'S GYMNASIUM RENAMED SPORTSMED ARENA FOLLOWING \$1.3 MILLION PLEDGE TO UAH ATHLETICS

# EXPLORE UAH.

DISCOVER YOUR  
FUTURE.

UAH AT A GLANCE | SATURDAY | 04.28

Open to high school juniors and seniors, as well as transfer students, **UAH at a Glance** is a great way for you to gain insight into the Charger experience.

At this event, you'll have the opportunity to:

- ▶ Learn more about UAH academic programs
- ▶ Speak with representatives from Housing, Career Services, Financial Aid and more at the Student Services Browse Fair
- ▶ Discover what life is like as a Charger and learn more about student organizations
- ▶ Take a student-led campus and residence hall tour

Registration is required.

The deadline to register is **Monday, March 23.**

**UAH.EDU/ADMISSIONS**

## MORE WAYS TO VISIT

### INDIVIDUAL CAMPUS TOURS

Individual campus tours can be scheduled on most weekdays at certain times. Visit [uah.edu/visit](http://uah.edu/visit) for more information.

### VIRTUAL CAMPUS TOURS

You can explore UAH through our virtual campus tour at [uah.edu/admissions/undergraduate/discover-uah/visit-campus](http://uah.edu/admissions/undergraduate/discover-uah/visit-campus).

### SOCIAL MEDIA

Engage and connect with us daily by following our Admissions Office on social media:

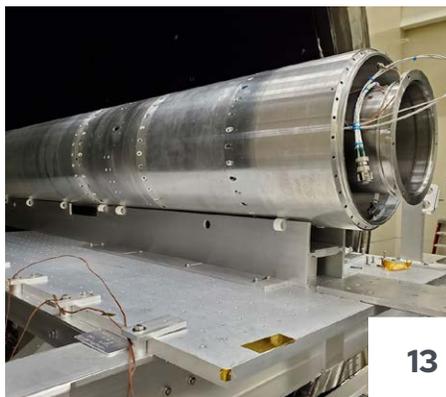


## QUESTIONS?

256.824.2773 | [admissions@uah.edu](mailto:admissions@uah.edu) | [uah.edu/admissions](http://uah.edu/admissions)



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# UAH Magazine

UAH Magazine brings together our academic accomplishments, innovative research projects, extracurricular organizations and alumni into one engaging source for all things UAH.

If you would like to receive a hard copy of this issue of UAH Magazine or be added to our mailing list to receive future issues, please contact [omc@uah.edu](mailto:omc@uah.edu).

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# UNIVERSITY ANNOUNCEMENTS



The UAH Department of Art, Art History, and Design received a \$10,000 grant from the Andy Warhol Foundation for the Visual Arts and the Helen Frankenthaler Foundation to support the 2026 Contemporary Art Fellow program. Works by printmaker and sculptor **Imin Yeh**, associate professor of art and director of Foundational Studies at the School of Art at Carnegie Mellon University, will be on display Feb. 20 until March 27 in the UAH Wilson Hall Gallery. The artist will visit UAH for a week of programming March 23-26.



**Dr. Bramwell Brizendine**, an assistant professor of computer science, was selected to receive a \$500,000 Young Faculty Award (YFA) from the Defense Advanced Research Projects Agency (DARPA). The funding will support the researcher's work on Binary Emulation and Analysis Simulation Technology (BEAST), a cutting-edge system that aims to create a more powerful framework for emulating and analyzing malware behavior, providing deeper insight into how malicious code evolves and spreads, including malicious functionality that ordinarily would not be reachable.



**Dr. Emil Jovanov**, a professor of electrical and computer engineering, was elected a Fellow of the National Academy of Inventors, the highest honor bestowed exclusively on academic inventors. Internationally known as the originator of wireless body area networks for health monitoring, the researcher is a pioneer in wearable health technologies whose work has influenced modern approaches to continuous health monitoring, medical devices and connected health systems. After 27 years at UAH, Dr. Jovanov retired effective Jan. 1, 2026.



**Royce Boyer**, founder and longtime chair of the UAH Department of Music, passed away on Oct. 31, 2025, at age 91. His legacy of music, mentorship and building community connections included creating and conducting three UAH choral ensembles, launching UAH's Arts & Entertainment Series and bringing renowned performers to campus. He was named Professor Emeritus in 1997. In the larger Huntsville community, he served as a guiding voice for the Huntsville Symphony Orchestra, Huntsville Community Chorus, Chamber Music Guild, Youth Orchestra and the Arts Council. An active UAH retiree, Boyer shared his love of music for a final time on campus during the fall 2025 semester when he taught a music appreciation course for OLLI at UAH.



UAH launched the **Southeastern Quantum Collaborative (SQC)** on Jan. 1. This regional initiative will accelerate the advancement and application of quantum information science and technology across the Southeast. "Quantum research is a national priority, and the technologies it produces are essential to maintaining our security and competitiveness," said Dr. Robert Lindquist, vice president for research and economic development at UAH. "By focusing our efforts on turning scientific discovery into real-world capability, we can provide meaningful support to federal agencies and address critical national needs." In addition to UAH, founding members include IBM, Davidson Technologies and Alabama A&M University.

# A MESSAGE FROM THE PRESIDENT

*Charles L. Kan*

The spring semester is well underway at the University of Alabama in Huntsville, and our campus and community continue to experience a season of remarkable progress.

Over the past several months, Huntsville has seen significant economic and workforce developments that underscore our region's growing national profile. Most notably, Eli Lilly and Company recently announced a historic \$6 billion investment in North Alabama – an announcement that reflects strong confidence in the talent, innovation and collaborative spirit that define this region. As UAH continues to prepare a highly skilled, workforce-ready talent pipeline through hands-on, applied learning, we are proud to play a central role in supporting this growth and connecting academic excellence to real-world impact.

We are equally proud of the continued success of UAH Athletics, where competitive excellence is matched by strong academic achievement. UAH Basketball continues to compete at the highest level within the Gulf South

Conference (GSC). This season, our Women's Basketball team achieved a historic milestone, earning the first GSC regular season championship in program history after a record-setting run that included 11 consecutive wins. That same commitment to excellence extends into the classroom. We recently recognized 124 student-athletes with perfect GPAs during the spring and/or fall 2025 semesters as part of "4.0 Night" during Homecoming, underscoring our focus on developing well-rounded students. This success is further strengthened by the support of our community partners, including a generous gift from SportsMED Orthopaedic Specialists, P.C., which resulted in the naming of SportsMED Arena in Spragins Hall and will enhance the experience of our basketball and volleyball student-athletes for years to come.

Across campus, progress is visible in every direction. The Raymond B. Jones Engineering Building is nearing completion and will open in time for the fall semester, featuring state-of-the-art instructional spaces, including the new Louis B. Weiner Artificial Intelligence

and Machine Learning Lab. Renovations continue at the Bevill Center, transforming it into the Center for Cybersecurity Research, Education and Advanced Training and further strengthening UAH's national leadership in cyber research. Additional investments in athletics facilities, the Conference Training Center and fitness center are enhancing the overall student experience.

Looking ahead, we are especially excited about Exploration Plaza. With the support of U.S. Sen. Katie Britt and U.S. Rep. Dale Strong, UAH recently secured \$14.2 million in congressionally directed federal support. This investment will allow us to expand our campus and create a dynamic innovation hub that serves our students, the high-tech workforce and the greater Huntsville community.

Together, these developments reflect a university on the move – focused on students, strengthened by partnerships and committed to creating lasting impact for our campus, our community and the region we proudly serve.

Go Chargers! ■

# UAH awarded contract to support DARPA program, first for Department of Biological Sciences

**D**r. Jerome Baudry, chair of the Department of Biological Sciences, helped UAH land a Defense Advanced Research Projects Agency (DARPA) contract to support the Microsystems Induced CAtalysis (MICA) program in partnership with CFD Research Corporation. The initiative seeks to develop microsystems that can precisely influence the activity of molecular catalysts by using physical forces imparted by the microsystem. The award marks the first DARPA contract ever granted to the department at UAH.

The program aims to address significant challenges in accurately predicting how molecular catalysts behave when integrated with microsystem surfaces and how their activity can be modulated in complex environments. Accurate prediction is crucial for controlling the activity of molecular catalysts integrated into microsystems to enable breakthroughs in areas like materials synthesis, drug delivery and environmental cleanup.

"It is tremendously gratifying and underscores the university's ability to contribute at the highest levels of scientific innovation," Baudry says. "I believe that UAH and CFD were selected because, together, we possess

the expertise, leadership and credibility to provide such a diverse and integrated understanding of how experiments and theory can drive one another forward. CFD's scientific excellence is recognized internationally, and this award marks a strategic development for UAH as we extend our collaborations with them into the broad umbrella of biophysics and life sciences. Truly, the sky is the limit for what we can accomplish together."

By developing innovative modeling, simulation and fabrication techniques that can precisely influence molecular catalytic activity, MICA has the potential to unlock transformative breakthroughs in materials synthesis, medical therapeutics, environmental remediation and beyond.

"The broad goal is to combine state-of-the-art computational modeling with experimental efforts conducted at partner institutions," Baudry explains. "The UAH/CFD partnership is one of only two groups in the nation selected by DARPA to provide the theoretical and computational modeling backbone that will support experimental work conducted by some of the country's top universities and research institutions."

The work will touch on a number of cutting-edge fields, from engineering simulations and software development,

to prototypes and biomedical technologies.

"This project sits at the intersection of computational biology, biomedical science and engineering simulation," Baudry says. "It involves large-scale molecular dynamics, artificial intelligence, quantum mechanical calculations and software development for simulating specific biological functions. The outcomes will inform biomedical and technological applications, while also advancing computational modeling approaches more broadly."

Baudry reports he and his students will animate the CFD/UAH computational modeling and simulation effort at the atomistic and molecular levels.

"Our team will provide the theoretical and computational framework to analyze biological events at atomic resolution, closely reproducing in silico the many experimental variables that other teams are considering developing and using," the researcher explains. "Our job, together with CFD, is to tell the experimental groups in the U.S. what experiments they should be doing, so they do not have to spend an enormous amount of time and resources planning for experiments that will not work or that will not generate the data they are looking for." ■



Truly, the sky is the limit for what we can accomplish together.

# HONORING IMPACT, LEADERSHIP AND LEGACY:

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UAH DEBUTS SAPPHIRE EXCELLENCE AWARDS

The University of Alabama in Huntsville (UAH) is proud to introduce the Sapphire Excellence Awards, an annual initiative honoring the outstanding achievements of alumni, partners and supporters who advance the university and its impact locally and beyond.

The Sapphire Excellence Awards feature five categories: Distinguished Alumni Fellows, Graduate of the Last Decade (GOLD) Award, Presidential Community Award, Charger Champion Award and Research Impact Award.

The Distinguished Alumni Fellows program recognizes outstanding UAH graduates who have made a lasting impact in their professions, in society, or at the university through exceptional achievement, philanthropic leadership and meaningful service.

“The Distinguished Alumni Fellows program builds on the legacy of the Alumni of Achievement program, elevating recognition for outstanding alumni who have made a lasting impact,” said Kelly Myers, director of Alumni Relations and Special Events at UAH. “The honor celebrates UAH graduates whose exceptional professional success, philanthropic leadership and meaningful service exemplify the very best of Charger Excellence.”

Similarly, the Graduate of the Last Decade (GOLD) Award highlights alumni who have graduated within the past 10 years and who have already demonstrated significant professional success, community engagement and commitment to UAH.

The Distinguished Alumni Fellows and GOLD Awards are nomination-based honors. Nominations were accepted between Jan. 15 and Feb. 20.

The remaining recipients will be selected by university leadership. The



# SAPPHIRE

## EXCELLENCE AWARDS

Presidential Community Award – UAH’s highest honor presented by the university president – recognizes an individual or company whose service has enhanced UAH and strengthened Huntsville, Madison County or the state of Alabama. The Charger Champion Award honors individuals or families who exemplify exceptional dedication to the university, while the Research Impact Award celebrates partners whose work expands and strengthens UAH’s research enterprise.

“We are proud to introduce the Sapphire Excellence Awards as a new way to recognize the alumni, partners and supporters whose achievements

and service move UAH forward,” said Kristina Hendrix, vice president for strategic communications at UAH. “This program reflects our commitment to celebrating excellence and honoring the individuals and organizations whose contributions strengthen the university, advance research and support the continued growth of our community and state.”

Following the selection process, the awards will be presented at the Sapphire Excellence Awards gala, held on the UAH campus on Thursday, April 2. Ticket and sponsorship information will be available. ■

## The Sapphire Excellence Awards feature five categories:

- **Distinguished Alumni Fellows**
- **Graduates of the Last Decade (GOLD) Award**
- **Presidential Community Award**
- **Charger Champion Award**
- **Research Impact Award**

# NSF EPSCoR Graduate Fellowships at UAH



UAH invites high-achieving doctoral students to apply for the National Science Foundation (NSF) Established Program to Stimulate Competitive Research (EPSCoR) Graduate Fellowship Program (EGFP) at UAH. Backed by a \$2.4 million NSF award, UAH will fund up to 15 doctoral fellowships across multiple STEM disciplines.

This prestigious program is designed for students who have earned an Honorable Mention from the NSF Graduate Research Fellowship Program (GRFP) and are ready to take the next step in advanced research.

“We want every student who has earned an NSF GRFP Honorable Mention to seriously consider UAH, and we would like all students to be aware of the high-quality, competitive doctoral programs our fine university has to offer,” said Dr. Jon Hakkila, Associate Provost of International Services and Academic Integrity, and Dean of the Graduate School at UAH. “This fellowship provides a unique opportunity for top doctoral talent to study at one of the nation’s premier research universities that has 16 high-tech research centers and laboratories on campus, a rigorous, hands-on STEM curriculum, and a reputation for academic excellence.”

## Fellowship Benefits

- 3 years of funding
- \$37,000 annual stipend
- \$16,000 annual cost-of-education allowance
- Flexible use within a 5-year eligibility window

## Signature STEM fields

- Astronomy and Astrophysics
- Heliophysics and Low-Temperature Plasmas
- Atmospheric Sciences
- Mechanics of Materials and Structures for Aerospace Systems
- Engineering Design and Systems Engineering
- Computing & Artificial Intelligence

## How to Apply

Eligible students may apply through the NSF Education and Training Application (ETAP) system through June 2028.

Additional Information is available on the UAH Graduate School Fellowships page at [www.uah.edu/admissions/graduate/financial-aid/fellowships](http://www.uah.edu/admissions/graduate/financial-aid/fellowships). Scan the QR code for details.



Alabama's health landscape is bleak: third worst in the nation in longevity, second worst in veteran suicide rates and infant outcomes, and the very worst in maternal outcomes. But health care professionals don't quit when facing hard problems. They find good solutions.

Enter UAH Neighborhood Nursing, a multi-agency initiative developed by the College of Nursing to bring free onsite health screenings plus primary preventive care to rural communities and those facing access challenges.

The college introduced the program and several of its community partners during SHINE 2025, the second annual Symposium for Health Innovation and Neighborhood Engagement, on Oct. 21 on the UAH campus.

Dr. Helen Lien, senior development officer, outlined the mission: "To strengthen community health by improving access to care and supporting longer, healthier lives through collaboration among local leaders, health professionals and community stakeholders."

Dr. Azita Amiri, professor and associate dean for research in the College of Nursing, brought this transformative concept to UAH. A recognized advocate for accessible public health, she is a Fellow of the Johns Hopkins Bloomberg School of Public Health.

"We draw inspiration from places like Costa Rica," she said, "where community-engaged health systems support longer, healthier lives."

Informed by the Neighborhood Nursing model developed at the Johns Hopkins University School of Nursing in Baltimore, UAH Neighborhood Nursing is part of a broader movement

## Be our neighbor

College of Nursing's UAH Neighborhood Nursing initiative targets communities with greater health need



▲ Dr. Tisamarie Sherry, vice president of the Health Policy Division at the Urban Institute, was the keynote speaker for SHINE 2025 at The University of Alabama in Huntsville (UAH) Oct. 21.

in community-based care, Amiri noted. However, UAH adds a unique component: embedding undergraduate nursing students in communities to deliver primary and secondary prevention as part of clinical training.

UAH's model benefits students, policymakers and community partners by translating neighborhood-level insights into education, planning and action. Working alongside faculty in community settings gives students clinical experiences to encourage compassion, empathy and service. Faculty, students and academic partners collaborate with communities to conduct innovative research and quality improvement projects that generate new knowledge and inform better decision-making.

Along with Amiri, core faculty on the team include Dr. Darlene Showalter, Dr. Melissa Foster, Dr. Laura Graham, Dr. Shikha Modi, Dr. Michele Kane, Dr. Misty Smith and Preston Miller.

The program's External Advisory Board launched in November, and a podcast is in the works for spring 2026. The first onsite health screening took place in January 2026. Pilot sites include the Robert "Bob" Harrison Senior Wellness and Advocacy Center, the Town of Triana and Huntsville Housing Authority neighborhoods Brookside and Northwoods.

For more information or to explore partnership opportunities, visit the Neighborhood Nursing page on the UAH website. ■

# THE FUTURE IS DIGITAL

## UAH named a Dassault Systèmes 3DEXPERIENCE Edu Center of Excellence to transform digital engineering education

UAH was recently designated a Dassault Systèmes 3DEXPERIENCE Edu Center of Excellence, recognizing the university's leadership in advancing digital engineering education and workforce preparation. Officials announced the partnership during a ceremony on Nov. 5, 2025.

The designation enhances UAH's ability to deliver hands-on training in model-based systems engineering, simulation, virtual twin technology and digital manufacturing. Through the integration of Dassault Systèmes'

3DEXPERIENCE platform, UAH will equip students and researchers with industry-standard tools used by leading aerospace, defense and technology organizations. This unified digital ecosystem connects classroom learning with advanced research and real-world applications, providing students with collaborative experiences that mirror professional engineering environments.

"Today culminates months of collaboration – and launches a groundbreaking program that will deepen insights and enhance access to the digital innovations driving Redstone

Arsenal and the engineering sector," said Dr. Robert Lindquist, UAH vice president for research and economic development. "This effort aligns with our goal of delivering the most relevant course curriculum and exposure to digital engineering tools to prepare our students for future careers within the government and industry."

Authorized in September 2025, the designation affirms UAH's commitment to digital transformation in higher education. The university will align curriculum development, faculty training and industry engagement with the 3DEXPERIENCE Edu Center of Excellence Charter to meet global academic and research standards. The recognition also supports regional economic development by strengthening the pipeline of graduates prepared to meet the evolving needs of the Huntsville technology corridor and its aerospace, defense and advanced manufacturing partners. ■

## TO THE STARS

CanSat and rover teams notch winning performances in 2025



Three CanSat teams placed first, second and sixth nationally in the 2025 International CanSat competition in Monterey and Staunton, Va. UAH teams BlueStreak, Cosmos and Rotorstorm also placed sixth, eighth and fourteenth, respectively, in the international rankings for the annual event that showcases student-built CanSats, a type of miniature satellite designed to simulate an actual space mission. This year's primary objective was to descend using a passive autogyro system.

Hosted by the American Astronautical Society, the competition challenges students to fit all major satellite subsystems, such as power, sensors and communication, into a relatively small volume. Each CanSat is then launched

by a rocket or deployed from a balloon to carry out a mission.

UAH team ASTRA also placed 10th internationally out of 38 university teams that reached the competition level from a pool of 116 initial entrants in the annual University Rover Challenge (URC).

The robotics competition for university students is held at the Mars Desert Research Station (MDRS) near Hanksville, Utah. Student teams design and build rovers to perform tasks that would be necessary for astronauts exploring Mars, such as science collection, equipment servicing and autonomous navigation. The event takes place in a challenging, desert environment that resembles the Martian landscape. ■

# ZOOM!

## UAH student discovers fastest gamma-ray burst ever recorded

Sarah Dalessi, a fifth-year student in the College of Science, is the lead author of a paper published in *The Astrophysical Journal* that details her discovery of the fastest gamma-ray burst (GRB) ever recorded. GRB 230307A is a gamma-ray burst in the ultrarelativistic category, meaning the velocity of the GRB's jet, a focused beam of high-energy particles and photons, came within 99.99998 percent of the speed of light – 186,000 miles per second – making it the fastest GRB ever observed. The observation was made possible with data from the Fermi Gamma-ray Burst Monitor, one of two instruments on NASA's Fermi Gamma-ray Space Telescope.

"The Lorentz factor is the measure of speed of the jet here, and 1,600 is the

highest we ever measured," explains Dr. Peter Veres, an assistant professor who works in the UAH Center for Space Plasma and Aeronomic Research (CSPAR) and co-author on the study.

The Lorentz factor measures the relativistic velocity of the ejected fireball, providing insights into the GRB's energy, luminosity and the surrounding environment. GRB jets are thought to have Lorentz factors ranging from about 100 to 1,000, with typical values around 300.

Dalessi, a graduate research assistant with CSPAR, began working with the Gamma-ray Burst Monitor (GBM) team in 2021. The group is a collaborative effort between NASA and the National Space Science and Technology Center (NSSTC) at UAH, which acts as the

operations center, and the Max Planck Institute for Extraterrestrial Physics (MPE) in Germany. The team also recently discovered the brightest GRB ever observed.

"Part of my responsibilities on the team is to be what is called a 'burst advocate,'" Dalessi explains. "Which means I have a number of shifts per month where I am responsible for processing and classifying incoming triggers from the satellite. It was during one of my shifts when I got the trigger notification for GRB 230307A, and right away, I knew that this was an extraordinarily bright event, perhaps the second or third brightest GRB ever. To be a part of such a unique discovery is not something I ever planned or dreamed of." ■

## Dr. Lee Ellenburg appointed state climatologist



Alabama Governor Kay Ivey has appointed Dr. Lee Ellenburg as the state's new state climatologist, marking a leadership transition for the Alabama Office of the State Climatologist. The office is housed within The University of Alabama in Huntsville's Earth System Science Center (ESSC) and serves as a primary source of climate monitoring, analysis and information for the state. Ellenburg succeeds Dr. John Christy, director of the ESSC, who has served as state climatologist since 2000.

"I am deeply honored to be named the Alabama state climatologist," Ellenburg says. "Serving Alabama in this role allows me to bring more than a decade of applied climate and water research into direct service of the state."

Ellenburg has served as associate state climatologist since 2021 and has been closely involved in the office's operations, research activities and outreach efforts. A UAH alumnus with doctoral training in civil and environmental engineering, he specializes in applied climate science that supports real-world decision making. His work spans drought preparedness, agricultural risk management, land surface hydrology and climate data applications, with a focus on developing practical tools for agencies and communities.

He has contributed to statewide monitoring networks, including Alabama's soil temperature and moisture monitoring system, expanded drought outreach and assessment efforts, and strengthened collaboration with partners such as the Alabama Office of Water Resources, the Alabama Department of Agriculture and Industries, the Alabama Cooperative Extension System and the Alabama Forestry Commission. Ellenburg also serves as principal investigator on major federally funded projects related to drought monitoring, water resource management and agricultural resilience.

The Alabama Office of the State Climatologist supports decision making in agriculture, water resources, emergency management, forestry and infrastructure planning by producing climate summaries, drought assessments and monitoring tools. The office serves as Alabama's lead contributor to the U.S. Drought Monitor and provides input to state drought planning. Among its widely used tools is the Lawn and Garden Moisture Index.

"By maintaining a strong foundation in objective science and stakeholder engagement, the office will continue to serve as a trusted resource for all Alabamians," Ellenburg says. ■



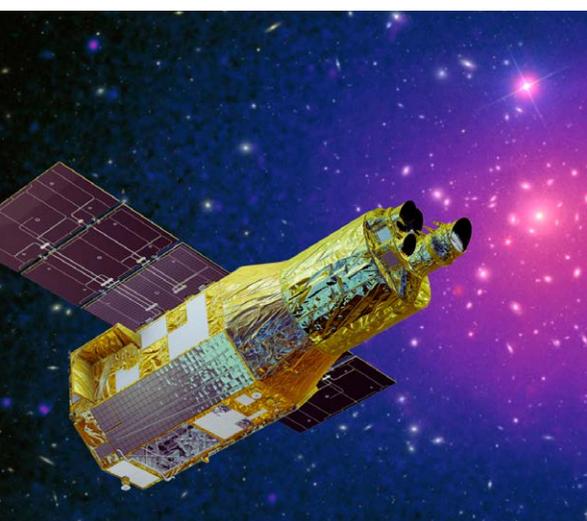
## Researcher wins \$1.27M award to study solar flare dynamics

Despite decades of observations, our understanding of plasma conditions during solar flares has been limited by instrument capabilities. Understanding the physical processes that transfer energy during solar flare evolution is crucial for developing techniques to forecast when flares will occur and how they will impact Earth's magnetosphere and atmosphere.

Dr. Athiray Panchapakesan has received a \$1.27 million grant for a third sounding rocket flight of the Marshall Grazing Incidence X-ray Spectrometer (MaGIXS) to investigate these phenomena as part of its second solar flare campaign. This forecasting capability is central to NASA's mission to protect astronauts,

satellites and power grids from solar radiation – a growing priority as human presence in space expands.

“MaGIXS-3 is a follow-up to flights 1 and 2 that will observe solar flares during their decay phase, which is critical to understanding the long-term effects of a flare, how energy is dissipated and how the sun's atmosphere recovers,” Panchapakesan notes. “I served as deputy instrument scientist for MaGIXS-2, and those observations inspired me to propose a solar flare rocket campaign with MaGIXS. This phase will reveal details about the flare's energy release, plasma heating and compositional changes in the solar atmosphere – all important for space weather forecasting and space physics.” ■



## Hide and Seek

Dark matter can be detected in unidentified X-ray emission lines of galaxy clusters

Dr. Ming Sun used data from the X-ray Imaging and Spectroscopy Mission (XRISM) to demonstrate “decaying” dark matter (DDM) – theoretical particles that slowly decay over vast cosmic timescales – can potentially be detected in “unidentified” X-ray emission lines in the spectra of galaxy clusters.

X-ray emission lines are unique fingerprints of elements that appear as peaks in an X-ray spectrum. Unidentified lines are mysterious spectral signatures, notably detected around 3.5 kiloelectron volts (keV), that don't match known atomic signals, such as those of known atoms like iron, silicon, sulfur and nickel. The leading candidate for these mystery

lines is the decay of a hypothetical dark matter particle called a sterile neutrino, a nearly massless particle that barely interacts with normal matter and could prove crucial to understanding the structure of the universe.

“The existence of the sterile neutrino can explain the very small but non-zero mass of regular neutrinos,” Sun notes. “This study provides the strongest limits from high-energy-resolution data on the sterile neutrino at the 5 - 30 keV band, subsequently limiting the models for dark matter. With more XRISM data in the next 5-10 years or so, we will be able to either detect the line or improve the limit substantially.” ■



## BETTER TOGETHER

Researcher wins \$600K NSF grant to pioneer collaborative learning for drones

**D**r. Dinh Nguyen won a \$599,830 National Science Foundation grant to enhance the security, efficiency and effectiveness of Unmanned Aerial Vehicles (UAV) or drones by using collaborative Artificial Intelligence (AI). The advance pioneers using secure multi-modal federated learning (MFL) over UAV networks that have become increasingly vital to military, government and civilian applications. The project focuses on improving disaster response, environmental monitoring, infrastructure inspection and cybersecurity.

Conventional machine-learning techniques often train these devices on paradigms that require transmitting all raw data from UAVs to centralized servers. This approach can be impractical due to privacy concerns,

limited bandwidth and the time required for a task to be completed.

“MFL lets a group of drones ‘learn together’ without sending all their raw data to a single server, enabling drones with different sensors and data types to learn collaboratively under limited communication and computation resources,” Nguyen explains. “This establishes a foundation for resilient, privacy-preserving and intelligent airborne networks.”

The technology enables multiple clients to train a single global model using data from different formats, without the need to share each drone’s local, private data.

“This ultimately improves the resilience and reliability of distributed AI in time-sensitive, resource-constrained and adversarial environments,” the researcher says. ■

## COLD SPRAY, HOT FIX

Professors receive grant to develop improved system to repair hardware without welding

**P**rofessors Sarma Rani and Judith Schneider received a grant from Titomic, Ltd., to develop a novel cold-spray gun that will use the flow of high-speed particles to repair damaged surfaces in engineering hardware without welding or the need of a blow torch.

“A cold-spray gun is cheaper and much safer to operate when compared to welding,” Rani explains. “Initially, Titomic was looking to improve the design of their commercially marketed cold-spray gun system. The project was envisaged as just a computational modeling effort to achieve the design objective. But, as our discussions with Titomic evolved and matured, they were interested in not just improved designs

but also fabrication of actual spray guns based on the new designs.”

Cold-spray guns can play a pivotal role in the cost- and time-effective repair of structurally damaged parts in engineering hardware, particularly in aerospace applications. The system uses finely powdered, solid-state materials like metals, metal alloys and some ceramics or intermetallics to create coatings and build structures by driving the particles to a supersonic flow through a converging-diverging nozzle that are then sprayed onto the desired location. Once the accelerated particles impact a surface, they deform to create a strong metallurgical bond without melting. ■

# FROM 'FOREVER' TO FIXABLE

## Researcher wins \$1.2M NSF grant to combat 'forever chemicals'

**D**r. Yu Lei won a \$1.2 million National Science Foundation (NSF) grant to study ways to remove and convert per- and polyfluoroalkyl substances (PFAS), synthetic chemicals that can pose health and environmental risks due to the strong chemical bonds they exhibit, making them difficult to eradicate. The initiative is part of a \$6 million collaborative effort by researchers from Alabama, Delaware and South Carolina.

PFAS comprise thousands of man-made chemicals called "forever chemicals" because they don't break down easily in the environment or the body, accumulating in water, soil and living things. Used in non-stick pans, waterproof gear, food packaging and cosmetics for their water/stain resistance, PFAS are linked to serious health issues like cancer, immune problems

and fertility issues, prompting stricter regulations and a push for safer alternatives like glass or stainless steel.

The initiative addresses the challenge by integrating expertise in materials science, separations, reaction engineering, electrochemistry, process systems, multiscale modeling, artificial intelligence and social science.

"PFAS are often called 'forever chemicals' because their carbon-fluorine bonds are among the strongest in chemistry, making them very hard to break down," Lei notes. "They can move from one place to another, for example, from water into soil or sludge, instead of being truly destroyed. That persistence makes them difficult to manage.

"Our role is to tackle that challenge by focusing on two key steps: first, developing ways to actually break

down or defluorinate them so they can be converted into harmless materials. We're looking at this within a circular economy context – meaning not just removing PFAS, but finding sustainable ways to recover and reuse materials and energy along with the process."

Lei points out that PFAS are unique materials that provide important performance benefits in many technologies, from medical devices to electronics and renewable energy systems.

"Replacing them completely is not simple, since these materials offer properties that are hard to duplicate," he says. "The challenge is managing them responsibly so that their use remains safe and sustainable. The ultimate goal is a balanced approach that supports both innovation and environmental protection." ■



## POWER OF IMAGINATION

### Easterly addresses key to cybersecurity challenges

The fall Distinguished Lecture Series hosted Jen Easterly, former director of the U.S. Cybersecurity and Infrastructure Security Agency (CISA), America's premier cyber defense agency, where the speaker led the nation's efforts to transform the agency into a \$3 billion operation with over 10,000 employees.

"There are three buckets of threats to think about when you define the cyber threat landscape," Easterly noted. "The first is the industrialization of

the ransomware ecosystem. The first ransomware attack occurred in 1989, involving a demand for a check for \$189. Now global cyber-crime damages are expected to cost the world \$10.5 trillion by the end of this year.

"Second is the weaponization of data. There is a cyber attack roughly every 30 seconds, and the average data breach in the U.S. costs over \$10 million. The last big trend is China's cyber army as a machine of disruption and destruction. China has now embedded itself in some of our most sensitive critical infrastructure, power systems, water systems, transportation systems and communications systems, to be able to hold our nation at risk in the event of a crisis in Taiwan."

Easterly called herself a "relentless optimist who feels now is the most exciting time to be in this field, because of the innovation being generated at the intersection of cybersecurity and

artificial intelligence. I have always believed in the power of imagination, and that obsession remains with me today. I fundamentally believe it is the responsibility of all of us as leaders in government, in business, in academia and civic life to leverage the power of imagination without suffering a failure of imagination.

"What's happening right here at UAH perfectly captures that spirit through the Center for Cybersecurity Research and Education," the speaker concluded. "Huntsville has always been a place where imagination meets reality. This university is doing exactly what our nation needs, turning imagination into capability, not just teaching the next generation of defenders, but actually building the science of resilience through cutting-edge research. You're helping to shape how we secure the infrastructure that frankly powers our way of life." ■

# LEADING THROUGH SERVICE:

UAH's annual MLK Leadership Breakfast focuses on improving health care for all

Before NASA establishes a colony on the moon, they'll need a reliable method to handle sanitation. Rural Lowndes County, one of Alabama's poorest areas, needs an effective sewage solution now.

The common nature of the problem gives hope to Catherine Coleman Flowers, founder of the Center for Rural Enterprise and Environmental Justice and an internationally recognized advocate for the human right to clean water and sanitation. She led efforts to identify health issues in Lowndes County, ultimately linked to failed sewage systems.

"NASA knows how to take urine and turn it into drinking water," she said, "but they don't know what to do with the solids. We're hoping to partner with NASA to come up with innovative ways to treat wastewater. The solutions they

find could potentially help places like Lowndes County."

Flowers talked about her career of service as keynote speaker for UAH's second annual Dr. Martin Luther King Jr. Leadership Breakfast on Jan. 14. The theme – Shaping the Healthcare Community of the Future – encompassed Flowers' work as well as the mission of the College of Nursing and its new UAH Neighborhood Nursing initiative. The program also featured a discussion with Flowers and Dr. Leon Lewis, Huntsville Hospital Health System; Tamika Alexander, WHNT-19 anchor, moderated the panel.

Kristina Hendrix, vice president for strategic communications, welcomed guests and shared two of King's quotes that particularly fit the occasion:

- *"A genuine leader is not a searcher for consensus but a molder of consensus."* – November 1967
- *"Everybody can be great because everybody can serve."* – February 1968

Flowers and her team served the Lowndes community by uncovering evidence that forged a new consensus. They collected blood and fecal samples that proved residents were suffering from hookworm and other parasitic diseases caused by exposure to raw sewage. When the study was published in 2017, she said, "it changed the trajectory.

"It never would have happened without community engagement. It never would have happened without the collaboration of educational institutions. It never would have happened without the medical profession. When we just talked about sanitation as an infrastructure issue by itself, nobody cared. But when we connected with the health care disparities, people started paying attention." ■





# STRETCHING TO ACHIEVE GOALS:

**New UAH athletic complex, cybersecurity center, Exploration Plaza development on track**

**U**AH moves forward in 2026 with three major construction projects aimed at strengthening its academic, research and athletic profiles while preparing to enhance the campus community and expand its footprint.

Site work has started on UAH's first Track and Field Complex on the west side of John Wright Drive across from Charger Park. It will feature an NCAA-compliant, 400-meter, 8-lane running track with jumping, vaulting and throwing event venues.

When it opens, UAH will be able to host on-campus sporting events, including Gulf South Conference and Division II championship events. UAH Athletics will increase its visibility among peer institutions, in the intercollegiate community, and in the local community. Most importantly, the complex will boost the recruitment of highly sought-after

students, faculty and staff to allow UAH's sports programs to continue and improve.

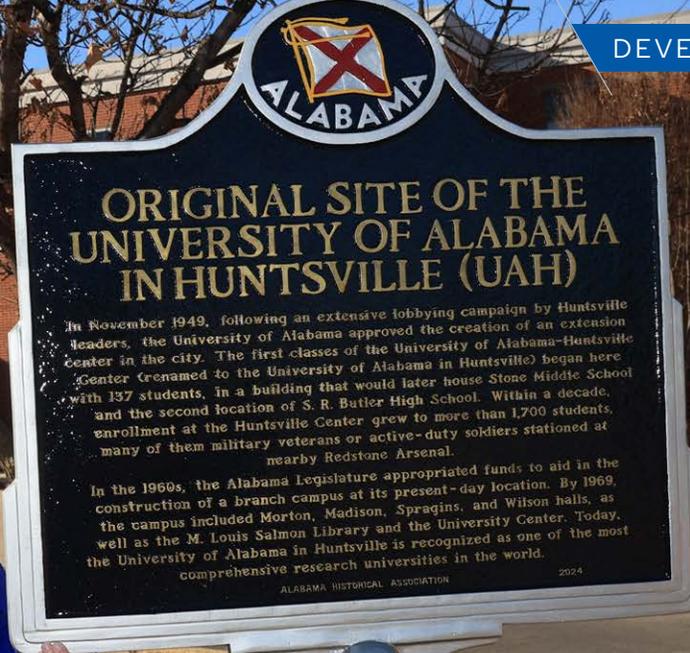
On the northwest side of campus, the Bevill Center renovation for the new Center for Cybersecurity Research, Education and Advanced Training also gets underway in 2026. The project will create an interdisciplinary research and academic facility aimed at attracting and retaining top students, researchers, faculty and staff as well as research client and partner relationships.

The facility will house the Center for Cybersecurity Research and Education (CCRE), the Computer Science Department, the Electrical and Computer Engineering Department and the Office for Research and Economic Development. It will meet the academic needs of a wide variety of cybersecurity-related disciplines.

The new Exploration Plaza development will occupy the 58-acre site of the former Executive Plaza on the west side of Sparkman Drive across from the Bevill Center. Capstone Development Partners and Lincoln Property Company will serve as master developer for the project, which is designed to meet the growing need for student housing and advanced research facilities.

Exploration Plaza will include two university-owned and two developer-owned components aimed at creating a vibrant "college town" environment, including a residence hall for non-first-year students, research facility, collaborative office facility and retail space.

Construction is expected to begin in 2027, pending final approvals by The University of Alabama System Board of Trustees. ■



## HONORING OUR ORIGINS

UAH historical marker at Campus No. 805 notes site of first classes in 1950

**D**reamers looking to the stars fueled the beginnings of UAH more than 75 years ago. A new historical marker at Campus No. 805, site of the first classes on Jan. 6, 1950, commemorates the original 137 students and honors UAH's development and dedication to that research-focused vision.

UAH President Dr. Charles Karr recalled those students on Dec. 16, 2025, when UAH representatives and supporters gathered to unveil the marker and celebrate the university's history and accomplishments. He thanked Barbara Wadsworth, a proud UAH supporter, for her "vision and generosity" in donating the marker as well as the UAH Foundation Board for helping to make the event possible.

"We started as a research entity, an extension center of The University of Alabama (UA)," Karr said. "In 1969, we became our own university."

Now UAH is one of America's premier doctoral-granting, research-intensive universities and home to 16 research centers. It's come a long way since November 1949 when, as the marker notes, UA approved the creation of the University of Alabama-Huntsville Center.

"Today UAH has almost 9,000 students," Karr said. "But we've held true to that mission of research. Last year our faculty and staff conducted about \$160 million in externally funded research. This research helps us produce outstanding graduates who provide the workforce for people in Huntsville."

Wadsworth has long been a cheerleader for the university and its role in Huntsville's history.

"I couldn't understand why there wasn't already a marker in place," she said. "This is an important historic development for the city and its progress."

David Moore, director of UAH's Salmon Library, recognized those who worked on the project and added his thanks for Wadsworth's gift.

"I want to recognize one of our grad students, Kyle Curtis. He wrote the lettering for the marker and did some research on that using our archives. I also want to give a shout out to Reagan Grimsley, head of Special Collections and Archives, and Drew Adan, university archivist, for their work on this project to get it going. Most of all, thank you, Barbara, for your idea and your initiatives moving this forward." ■

## COMPETITIVE EDGE

SportsMED makes \$1.3M pledge to UAH to name Spragins Hall gymnasium the SportsMED Arena

UAH Chargers have a new home court advantage in Spragins Hall. Thanks to a partnership with SportsMED Orthopaedic Specialists, P.C., the student-athletes will be playing basketball and volleyball in the SportsMED Arena for the next 10 years.

The orthopedic and spine care center gave UAH \$325,000 toward a total

pledge of \$1,300,000 to name the gymnasium. The University of Alabama System Board of Trustees approved the pledge and the naming at their Nov. 7, 2025, meeting.

"At SportsMED, we believe that world-class care begins with world-class education," said SportsMED Director of Business Development Kelsey Siniard. "UAH continues to push the boundaries of research, athletics and academic excellence, and we're proud to support an organization that's driving growth and opportunity in North Alabama. This partnership is an investment not just in UAH, but in the future of our community's health and success."

Dr. Eric Janssen is a board-certified orthopedic surgeon who specializes in innovative sports medicine and the treatment of shoulder and knee injuries at SportsMED.

"I've had the privilege of serving as a physician in this community for more than 30 years," he said, "and during that time I've watched UAH grow into one of the most respected institutions in the region. I've been honored to care for their student-athletes, faculty and administrators, and it's been incredibly rewarding to support a university that continues to elevate education, research and athletics right here in our community."

The new SportsMED Arena partnership builds on past support that has helped the Chargers thrive.

"We are so indebted to SportsMED and their long history of supporting the UAH Athletic Department," said Director of Athletics Dr. Cade Smith. "This partnership will help us to further enhance the experience of our student-athletes as we continue to elevate UAH Athletics in our city and region!" ■

*Welcome to SportsMED Arena*



# Transformative Leadership

**Dr. Shankar Mahalingam, dean of UAH College of Engineering, retires**



After 15 years of distinguished service as dean of the College of Engineering, Dr. Shankar Mahalingam recently retired, concluding a transformative tenure defined by growth, innovation and national impact. Since joining UAH in 2010, Mahalingam's leadership has elevated the college's academic profile, research enterprise and student success, leaving a lasting legacy for the university and the region.

Under his stewardship, the College of Engineering rose to No. 73 in U.S. News & World Report graduate engineering rankings, while UAH achieved a No. 1 ranking in Alabama for federal research expenditures in six categories. Research funding increased nearly tenfold, undergraduate enrollment grew by approximately 1,000 students and graduation rates climbed steadily, with the six-year rate rising from 57% in 2018 to 64% in 2025. All engineering programs maintained continuous ABET accreditation.

"Dr. Mahalingam's leadership helped transform the College of Engineering into a more research-intensive, student-centered institution with deeper regional impact," says UAH Provost Dr. David Puleo. "He promoted faculty excellence, expanded student opportunities and elevated the college's national reputation."

During Mahalingam's tenure, the college awarded more than 7,800 degrees across bachelor's, master's and doctoral programs. Faculty achievements flourished as well, including 11 National Science Foundation CAREER Awards and numerous Fellows of leading professional societies such as AIAA, ASME, IEEE and AAAS.

Mahalingam also guided major strategic initiatives, including securing nearly \$5 million in commitments for the new Raymond B. Jones Engineering Building, opening in 2026. In 2025, he led the launch of an undergraduate certificate in Artificial Intelligence in Engineering Applications and spearheaded the college's strategic roadmap, Flight Plan 2032, focused on student success, research excellence and regional engagement.

A Distinguished Professor of Mechanical and Aerospace Engineering, Mahalingam is internationally respected for his research in turbulent combustion, wildfire modeling and computational fluid dynamics. He remained deeply engaged in teaching, mentoring and funded research throughout his deanship, while championing experiential learning through co-ops, internships and undergraduate research aligned with Huntsville's aerospace and defense ecosystem.

Beyond campus, Mahalingam strengthened UAH's STEM outreach and fostered what he often called the "UAH Charger engineering family," celebrating student, faculty and alumni achievements. As he enters retirement, his vision and leadership continue to shape the College of Engineering's trajectory and its role as a driver of innovation for North Alabama and beyond. ■



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Rev up your school spirit with the brand-new UAH vehicle license plate! Featuring the fierce new Charger Blue stallion, a vibrant Huntsville skyline and iconic North Alabama mountains, this plate shows off your UAH pride wherever you go.

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