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## 2020 Annual Report

University of Alabama in Huntsville

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# 2020 Annual Report



MORTON HALL

# MISSION

The University of Alabama in Huntsville is a research-intensive, internationally recognized technological university serving Alabama and beyond. Our mission is to explore, discover, create, and communicate knowledge, while educating individuals in leadership, innovation, critical thinking, and civic responsibility and inspiring a passion for learning.

# VISION

The University of Alabama in Huntsville will be a preeminent, comprehensive, technological research-intensive university known for inspiring and instilling the spirit of discovery, the ability to solve complex problems, and a passion for improving the human condition – a university of choice where technology and human understanding converge.

# CORE VALUES

## ***Integrity and Respect***

We are guided by principles of ethics, treat others with deferential regard, and are civil in our interactions.

## ***Diligence and Excellence***

We work hard and are tireless in the pursuit of our goals and achieving outcomes of the highest quality.

## ***Inclusiveness and Diversity***

We honor the individual. We celebrate differences and use them to create unity.









A photograph of a man and a woman standing in front of a large, multi-story brick building with many windows. The man is on the left, wearing a grey suit jacket, a light blue shirt, and a blue patterned tie. The woman is on the right, wearing a black and white patterned top and a pearl necklace. They are both smiling at the camera. The text "PRESIDENT'S MESSAGE" is overlaid in large white letters on the left side of the image.

# PRESIDENT'S MESSAGE



It doesn't take long to understand why UAH is uniquely positioned to embrace the future. Situated at the heart of Alabama's "Technology Corridor," this university has a proud legacy of embodying a forward-thinking research, scientific, and technological vision and has become a center for intellectual development through the active recruitment of top-quality students and faculty. Evidence of the university's impact can be found throughout this report.

UAH has leveraged this vision and these resources to forge innovative partnerships with Redstone Arsenal, NASA's Marshall Space Flight Center, and Huntsville's corporate and technological network, such as Cummings Research Park. The university works closely with civic, government, corporate, and military leaders to cultivate talented minds and match them to vital roles within the community and beyond.

Huntsville/Madison County is one of the most dynamic metropolitan areas in the United States, rapidly changing and expanding in every aspect, including culture, economics, education, and health care. UAH is closely aligned with the region's academic and research needs and will always be a vital asset to its hometown, the State of Alabama, and the nation.

UAH's thirst for exploration knows no boundaries, beginning with the world beneath our feet and reaching all the way out to the stars. We see every challenge as an opportunity: an opportunity to grow, to learn, to give back, and to help. Our reputation for supplying solutions through knowledge is well known and respected. Our faculty and researchers boast decades of experience in surmounting complex challenges, helping federal agencies to protect our world and way of life from internal and external threats.

One of our goals is to constantly be on the forefront of looking for new and special ways to create positive change. Whether this change takes the form of UAH scientists leading the fight against COVID-19 or alumni creating internationally recognized art that speaks to diversity and hope for a better world, our university is a special place where dreams are not only born, but nurtured and fulfilled.



Darren Dawson  
*President*





# BY THE NUMBERS

## University Community

**10,000**

STUDENTS

**380**

FULL-TIME FACULTY

**528**

RESEARCH STAFF

**43K+**

ALUMNI

## Incoming Freshman Class – Fall 2020

**27.6**

AVERAGE ACT

**3.88**

AVERAGE HS GPA

**1,350**

FRESHMAN CLASS

## Graduates

**2,208**

DEGREES AWARDED  
IN AY 19–20

**62**

CERTIFICATES AWARDED  
IN AY 19–20

**44%**

OF DEGREES AWARDED  
ARE IN STEM SUBJECTS

**#1 ROI**

IN THE STATE FOR BOTH IN-STATE  
AND OUT-OF-STATE STUDENTS

–PayScale

## Research

# #13

IN NASA-FUNDED  
RESEARCH EXPENDITURES

# #26

IN DOD-FUNDED  
RESEARCH EXPENDITURES

### National rankings for federally-funded research expenditures

**#6** AEROSPACE ENGINEERING

**#10** ATMOSPHERIC SCIENCE

**#11** COMPUTER AND INFORMATION SCIENCES

**#14** ASTRONOMY AND ASTROPHYSICS

**#15** ECONOMICS

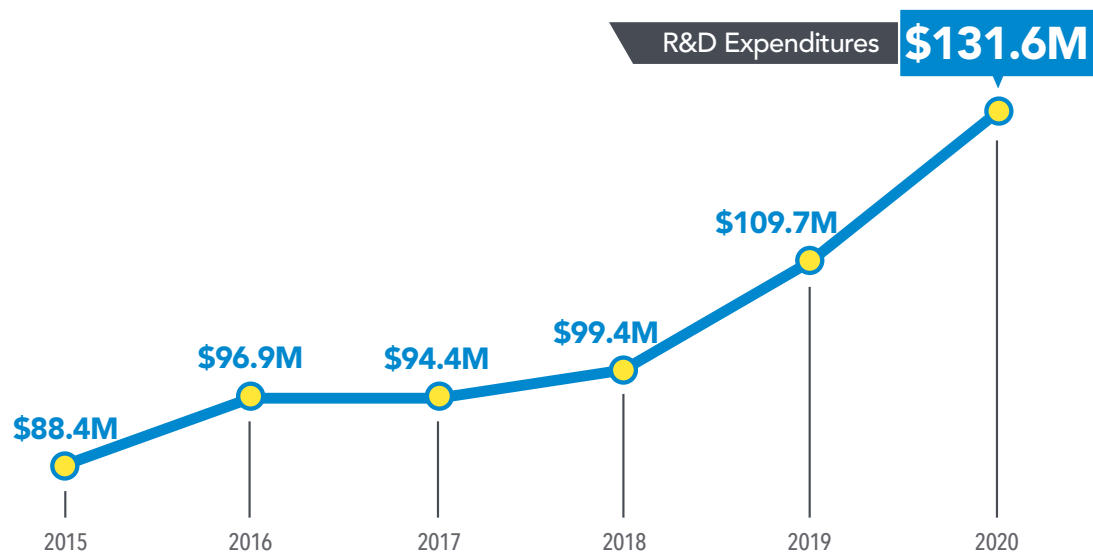
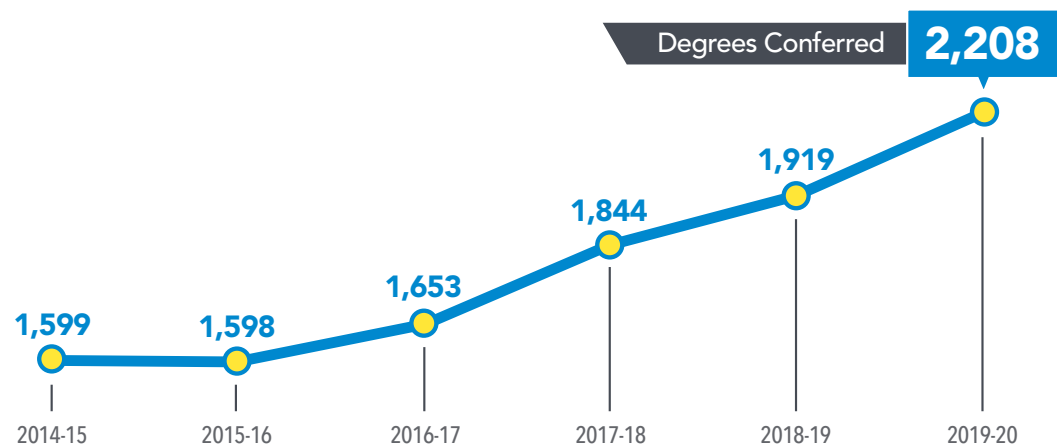
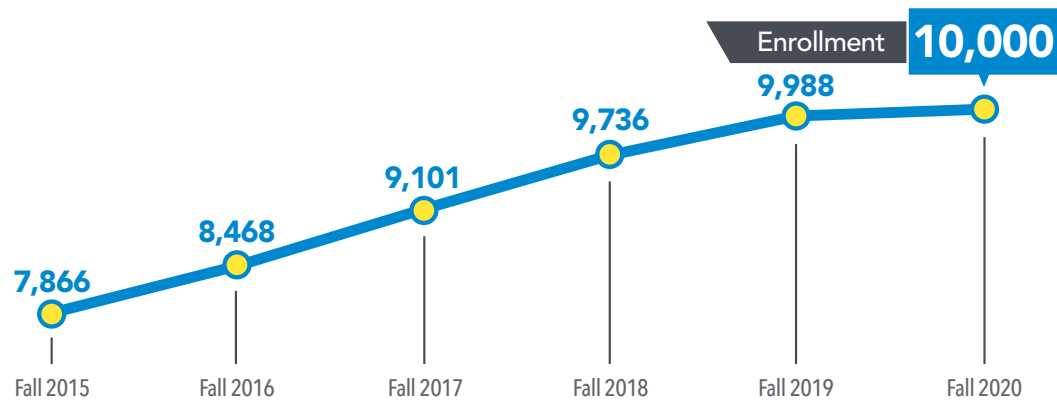
**#17** INDUSTRIAL AND MANUFACTURING ENGINEERING





# GROWTH





**27%**  
INCREASE IN  
ENROLLMENT

**38%**  
INCREASE IN  
DEGREES CONFERRED

**49%**  
INCREASE IN  
R&D EXPENDITURES





# WHERE WE EXPAND HORIZONS

To unlock the creativity and thought leadership that the future demands, UAH is the place to spark the development of intellectual curiosity at all ages and all stages. At any phase in their scholastic careers, students are welcomed by the university to engage in its innovative educational and research opportunities. UAH provides career learning support that includes professional development, certification, and customized training. The university is a vital vessel for lifelong educational encouragement and outreach from early childhood through career and retirement.





## K-12

- ▶ Alabama Math, Science, and Technology Initiative Host University
- ▶ Systems Management and Production Center – STEM Help Outreach Program
- ▶ Let's Pretend Hospital
- ▶ National Girl Scouts USA Cybersecurity Challenge
- ▶ GenCyber Camps
- ▶ Tech Trek
- ▶ Creating Entrepreneurial Opportunities program
- ▶ College Academy



## Undergraduate and Graduate Studies

- ▶ College of Arts, Humanities, and Social Sciences
- ▶ College of Business
- ▶ College of Education
- ▶ College of Engineering
- ▶ College of Nursing
- ▶ College of Professional Studies
- ▶ College of Science
- ▶ Graduate School
- ▶ Honors College

# The UAH Education Continuum



## Early Learning

- ▶ UAH RISE School
- ▶ Office of School Readiness
- ▶ 4-Year-Old Grant Classrooms
- ▶ Early Head Start Classrooms
- ▶ Head Start Classrooms



## Community College

- ▶ Pathways
- ▶ Visiting Student Program
- ▶ Shadowing Summer
- ▶ Community of Scholars
- ▶ Dual Nursing Degree Program



## Professional and Continuing Studies

- ▶ Professional Development Solutions – Certificates, Short Courses, and Customized Training
- ▶ Osher Lifelong Learning Institute



A photograph of three students in a laboratory setting. On the left, a male student in a black t-shirt and black face mask is working with a yellow gas cylinder. In the center, a female student in a purple shirt and blue face mask is also working with the equipment. On the right, another student is partially visible, wearing a blue face mask and safety goggles. They are all focused on a complex piece of equipment with various gauges and valves. The background shows a green lawn and trees, suggesting an outdoor or semi-outdoor lab environment.

# ACADEMICS

With over 100 areas of study across nine colleges, in addition to 17 different research centers and institutes, UAH has educational opportunities to fit every need. Education begins in the classroom, but it never stops there. Our students test their knowledge through research and apply it in internships and co-ops with an array of business and industry partners. That experiential approach to education gives our undergraduate and graduate students the career-ready skills they need to thrive.



## SPORTS AND FITNESS MANAGEMENT

The College of Education (CoEd) graduated its first cohort of B.S. degree students in Sports and Fitness Management (SFM) in 2020. The new degree can lead to everything from working with sports programs to project administration and event management. This flexibility allows the student to craft their path to their perceived strengths. "SFM majors take classes in sport business-focused classes in the areas of marketing, law, finance, event management, sociology, facility management, ethics, and a 200-hour capstone internship experience," says Dr. Michael Crow, assistant professor of kinesiology and program chair. "The knowledge, skills, and experience gained contribute to our students being job-ready upon graduation." Featuring 21 SFM majors, the CoEd anticipates the program continuing to grow as more and more students discover this option for a degree.

## DUAL NURSING DEGREE PROGRAM

UAH announced a partnership between the UAH College of Nursing (CoN) and Calhoun Community College (CCC) Nursing to offer a Dual Nursing Degree Program which began admitting students in spring 2021. The program enables students to obtain both an Associate Degree in Nursing (ADN) and Bachelor of Science in Nursing (BSN) simultaneously in five semesters of full-time study. Students admitted to the Dual Nursing Degree Program will graduate with an ADN from Calhoun and a BSN from the UAH CoN. A BSN degree is necessary to continue to graduate school for advanced practice degrees, such as nurse anesthetist, nurse practitioner, nurse educator, nurse administrator, and nurse researcher. The program also provides students interested in nursing an advantage over their peers from other programs as they enter the job market.

## ONLINE MBA

Beginning with the fall 2020 semester, the College of Business (CoB) began offering an online option toward achieving a Master of Business Administration (MBA). This plan to provide an alternate path to an MBA has been in the works since well before the COVID-19 crisis. This head start has enabled the faculty to fine-tune the virtual program to ensure an online MBA meets the same rigorous standards required of the traditional classroom student. The College's motto for the program is 'Online, On-Purpose.' The UAH CoB has earned a reputation for maintaining and fostering strong connections and partnerships to the business community in today's rapidly changing global economy. Online students will continue to benefit from these connections with plenty of networking opportunities to focus on experiential learning that goes beyond textbooks and lectures.

**100+**  
AREAS OF STUDY

**9**  
COLLEGES

**88**  
DEGREES

**1,000+**  
HONORS COLLEGE  
STUDENTS





# RESEARCH

Launched from America's quest to conquer space, UAH has robust research capabilities in astrophysics, cybersecurity, data analytics, logistics and supply chain management, optical systems and engineering, reliability and failure analysis, rotorcraft and unmanned systems, severe weather, space propulsion, and more. Faculty, staff and students conduct research with NASA's Marshall Space Flight Center, the U.S. Army, the Missile Defense Agency, the Defense Intelligence Agency, the Federal Bureau of Investigation, the National Science Foundation, the National Oceanic and Atmospheric Administration, the Department of Energy, the National Institutes of Health, and other governmental and business partners.

**6 PROGRAMS**  
RANKED IN THE  
**TOP 20**  
**NATIONALLY**

—NSF HERD survey

**\$131.6M**

RECORD HIGH ANNUAL R&D  
EXPENDITURES

**80+**

CORPORATE RESEARCH  
PARTNERSHIPS

## MICHAEL BRIGGS

Dr. Michael S. Briggs, an assistant director of UAH's Center for Space Plasma and Aeronomic Research (CSPAR), was awarded NASA's Exceptional Public Achievement Medal for contributions to the success of the Fermi Gamma-ray Telescope mission's Gamma Ray Burst Monitor (GBM) project. "These space projects are team efforts, the result of hard work by many engineers, programmers, and scientists," says Dr. Briggs, who developed a technique to use GBM to detect even very weak terrestrial gamma ray flashes. In partnership with the Laser Interferometer Gravity Wave Observatory (LIGO) group, the GBM team received the 2018 Bruno Rossi Prize for discovering gamma rays coincident with a neutron-star merger gravitational wave event. Dr. Briggs arrived at UAH in November 1991 to do research with the Burst and Transient Source Experiment (BATSE). BATSE overturned the previous scientific consensus that gamma-ray bursts originated from nearby neutron stars.

## ROTATING DETONATION ENGINE

A Rotating Detonation Engine (RDE) type rocket engine was test-fired for the first time this past year at UAH's Johnson Research Center. Mechanical and aerospace engineering master's student Evan Unruh says the engine took about a year to design and build. RDEs are a tantalizing engineering concept that could be transformative for rocket propulsion. RDEs promise to offer better fuel efficiency than continuous-burn solid or liquid propellant engines. Instead of a continuous burn, RDEs use a continuous spinning explosion to create supersonic gas and generate thrust. Unruh is mentored by Dr. Robert Frederick, UAH Propulsion Research Center (PRC) director, and has been advised by Scott Claflin, director of power innovations at Aerojet Rocketdyne, and a team including PRC staff. The UAH engine is intended as a test-bed to allow researchers to study various phenomena related to detonation combustion in RDEs.

## NEW ATOMIC LAYER DEPOSITION PROCESS

UAH researchers invented a way to deposit thin layers of atoms as a coating onto a substrate material at near room temperatures. Dr. Moonhyung Jang originated the idea, tested in the UAH lab of Dr. Yu Lei, to use an ultrasonic atomization technology to evaporate chemicals used in atomic layer deposition (ALD). ALD is a three-dimensional thin film deposition technique that plays an important role in microelectronics manufacturing to produce items such as central processing units, memory, and hard drives. Like a household humidifier, ultrasonic atomization generates a mist consisting of saturated vapor and micro-sized droplets. Each ALD cycle deposits a layer a few atoms deep, repeating the process hundreds or thousands of times. This technique offers exceptional control of nanometer features while depositing materials uniformly on large silicon wafers for high volume manufacturing.



# UNDERGRADUATE STUDIES

## Pressure and Body Mass in School-Aged Children

Dana Zahran, College of Nursing  
Thuy Lynch, Ph.D., RN

### Overview

With obesity on the rise in children, the risks that are associated with increased body mass index (BMI) are essential to understand. Children with increased BMI are at a higher risk for developing chronic diseases such as

elevated levels of insulin, lipids and blood pressure. If a link between BMI and blood pressure is determined, increased BMI in children will become a primary indicator for providers to monitor body mass and blood pressure at a younger age to prevent the formation of hyperlipidemia and atherosclerosis. pressure at a younger age to prevent the formation of hyperlipidemia and atherosclerosis.

The purpose of this study is to determine the relationship between blood pressure and body mass index in children ages 10-12 and compare the findings with results from a feasibility study conducted in a school setting by the faculty mentor.

### Methodology

A child (10-12 years of age) and parent who makes a visit to a clinic will be asked to participate in the study. After assent and consent from both the child and parents, respectively, have been received, parents will be asked to complete a Demographics Questionnaire form. Height, weight, and two blood pressure readings for each child participant will be measured and recorded. Data collection will take place in a private patient room within the clinic. Parents of each child participant will be present during data collection. The pediatrician's office nurse will be present during data collection.

### Clinical Practice Guideline for Screening and Management of High Blood Pressure in Children and Adolescents

- 2017 Clinical Practice guidelines endorsed by the American Heart Association and the American Academy of Pediatrics
- Tables categorize blood pressure based on age, sex, and height of child

#### Elevated Blood Pressure

- Systolic and diastolic  $\geq$  90th percentile to < 95th percentile

Undergraduate programs at UAH provide an exceptional educational experience through high-quality academic programs, academic support services, and unique state-of-the-art research and creative opportunities that prepare students to function effectively in a global society.

### Acknowledgements

I would like to thank Dr. Thuy Lynch for allowing me to join her research to further knowledge on the increasing rates of BMI in children and its possible effects on health. I would also like to thank Dr. Ann Bianchi for her support throughout this entire process. Finally, I would like to thank Dr. Nagendra B. Thotakura for his support and approval of this research in a clinical setting.

## STEM TOOLS FOR K-12 STUDENTS

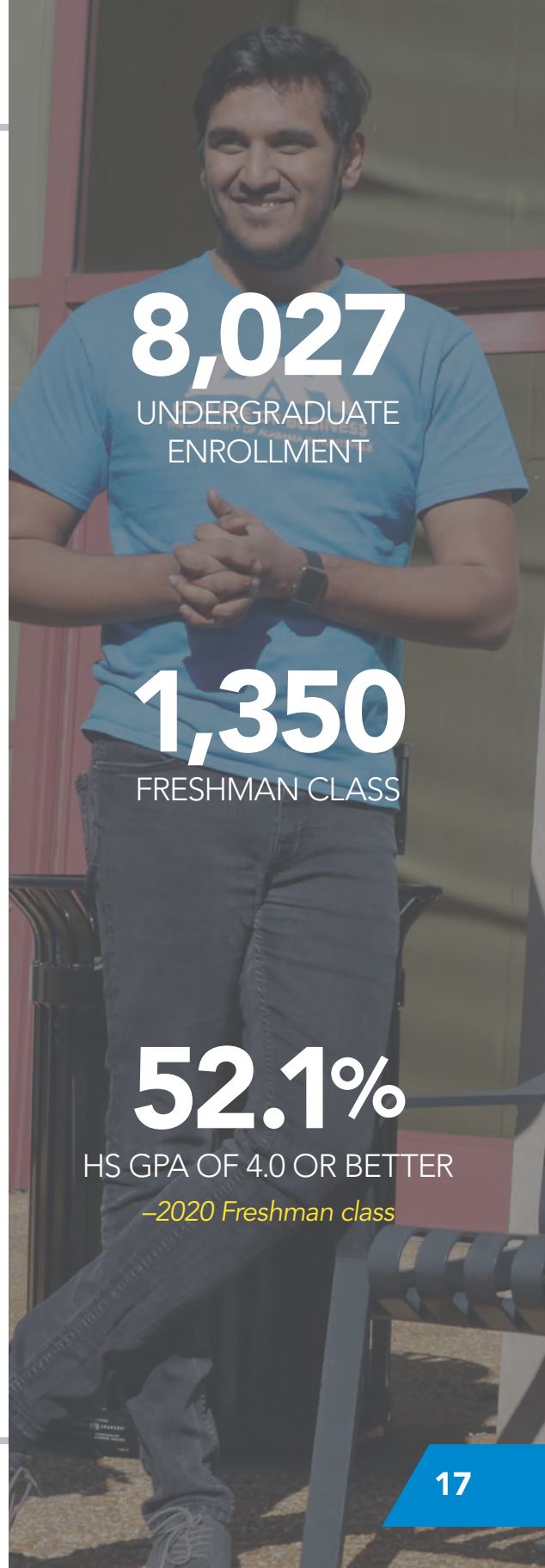
Two teams of senior students in Mechanical and Aerospace Engineering Product Realization designed STEM tool products to engage and inspire economically challenged K-12 students and spark interest in STEM careers. One team worked on a Wind Tunnel for the UAH student section of the American Society of Mechanical Engineers to use for K-12 outreach events, while the other developed a Dash Robots Recharging Station for Madison Cross Roads Elementary School. These projects are part of a STEM outreach effort to primary and secondary education that spans more than a decade. The new tools the teams created enabled K-12 students to engage in hands-on learning activities. Research shows that children garner a greater understanding of STEM topics when they are presented in a tactile manner as opposed to theoretical.

## SECOND PRIZE AT CSAW COMPETITION

Bashir Talukder, a senior in electrical and computer engineering, earned a second-place prize along with University of Kansas student Mahmudul Hasan in the Logic Locking Conquest at Cybersecurity Awareness Worldwide (CSAW) 2020. Several international and U.S. universities participated in the competition. Logic locking is a revolutionary technique for protecting the intellectual property of integrated circuits from a myriad of security threats, such as reverse engineering, overbuilding, piracy, and hardware Trojan insertion. The increasing globalization of the semiconductor supply chain has resulted in a proliferation of cybersecurity threats. Logic locking events like CSAW help students learn to combat this problem through "hardware obfuscation" which acts as a countermeasure to hide the design intent of a circuit or actually "lock" its functionality.

## RESEARCH HORIZONS DAY

Student research projects were awarded at the Research Horizons Day Poster Session. Undergraduate prizes were awarded for a number of intriguing projects, including: auditory fluency and memory performance; how Huntsville is running out of housing space; optics observatory conversion; utilizing NASA Earth observations to assess coastline replenishment; landslide simulations in Southeast Asia; the upregulation of liver proteins; heart healthy behavior in adolescents; reducing the incidence of delirium in the ICU, activation of upper extremity muscles; seeding hydrogen in nuclear thermal propulsion engines; design of a non-linear time-delayed circuit; and the impact of microstructure degradation in battery performance. "Dissemination of research and creative projects is an important part of inquiry-based learning, so events like Research Horizons are important because they give our students a chance to share what they have been working on," says David Cook, director of undergraduate research.



**8,027**  
UNDERGRADUATE  
ENROLLMENT

**1,350**  
FRESHMAN CLASS

**52.1%**  
HS GPA OF 4.0 OR BETTER  
*-2020 Freshman class*



# GRADUATE STUDIES

Whether continuing on to graduate school directly from an undergraduate program or returning to school to gain greater knowledge for advancement or changing careers, the Graduate School at UAH is here to help students take their academic career to the next level. Our master's and doctoral programs include national leaders in engineering, the sciences, business, nursing, education, arts, humanities, and social sciences.



## MOLLY MACAULEY AWARD

Research on seeded hydrogen in nuclear thermal rocket engines earned Dennis Nikitaev, a doctoral student in aerospace systems engineering, a 2020 American Astronautical Society (AAS) Molly Macauley Award. The annual student researcher competition seeks to recognize future space industry leaders by awarding and contributing to the professional development of outstanding college and university students. Nikitaev's research supports a UAH and NASA model for how a nuclear thermal propulsion (NTP) spacecraft might be engineered to achieve human flight to Mars. Nikitaev studied the effect that small molar concentrations of argon in hydrogen had on NTP engine and vehicle performance. NTP may hold promise for long-range missions, because it can help achieve the goals of low weight, high power, and good economy.

## NASA GRANT TO STUDY SOLAR PLASMA

Michael Terres, a research assistant in the department of Space Science, won a Future Investigators in NASA Earth and Space Science and Technology (FINESST) grant to study turbulence in solar plasma. FINESST provides research grants to graduate students who are designing and performing projects relevant to the goals of NASA's Science Mission Directorate. The award is up to \$135,000 over a period of 36 months. Terres' winning proposal uses a recently developed technique called Hermite Decomposition to investigate the solar wind proton velocity distribution function. This research aims to significantly improve our understanding of solar wind heating, one of the central goals of heliospheric physics, vitally important to increasing knowledge of how this turbulence impacts the Earth and its local magnetic habitat.

## PHYSICS STUDENT RECEIVES SPIE SCHOLARSHIP

Samantha Johnson, a doctoral student in physics, has been awarded a \$4,000 optics and photonics education scholarship by SPIE, the international society for optics and photonics. The award recognizes potential contributions to the fields of optics, photonics, or a related field. Johnson is a GRA in Marshall Space Flight Center's (MSFC) X-ray Astronomy Group at UAH's National Space Science Technology Center. She works on various types of X-ray optics for X-ray telescopes. Her research includes replicated X-ray optics, development of a polarized X-ray source for calibrating the NASA Small Explorers (SMEX) mission, and outreach efforts for the Lynx X-ray Observatory concept study. At MSFC, she is helping develop and assemble a device that polarizes X-rays through Bragg crystal diffraction. The device will be used to help calibrate the upcoming Imaging X-ray Polarimetry Explorer (IXPE) mission.



1,973

GRADUATE  
ENROLLMENT

#1

BEST MASTER'S IN SUPPLY  
CHAIN MANAGEMENT


—*Intelligent.com*

RANKED A  
"HIGH RESEARCH  
ACTIVITY"

UNIVERSITY

—*Carnegie Classification*





Artist credit: Sarah Joy Dunlap ('20 BFA Painting)

# DIVERSITY, EQUITY AND INCLUSION

The Office of Diversity, Equity and Inclusion (ODEI) strengthens diversity at UAH through its commitment to improving social and cultural awareness and encouraging self-understanding through education, training, and engagement with others. By offering enriching programs that promote cross-cultural perspectives and create mutual opportunities for exchange, ODEI fosters an inclusive environment for people of all races, ethnicities, cultures, ages, religions, languages, abilities, genders, and sexual orientations.





## 2021 REV. DR. MARTIN LUTHER KING, JR. COMMEMORATION

The Office of Diversity, Equity and Inclusion (ODEI) continues to showcase the representations and intersection of our lived experiences. This year's program centered on a quote from Rev. Dr. Martin Luther King, Jr.'s "Letter from a Birmingham Jail," entitled "Injustice anywhere is a threat to justice everywhere" that still resonates as a call to action and advocacy. To highlight this theme, UAH brought in Laverne Cox, an award-winning transgender activist, actor, and producer who spoke on her journey of survival to becoming herself and as an advocate for equal rights. Cox shared her views on race, class, and gender with a virtual audience from her recollections of growing up in Mobile, Alabama, to later embracing her identity in New York City, to provide an empowering message about self-acceptance to work for positive change. The commemoration boasted 184 attendees that concluded with an intimate discussion with ODEI Ambassadors.



Photo credit: Midori Maloney

## PRIDE PARADE

In October, ODEI, Housing and Residence Life, Student Life, and SGA hosted UAH's first #UAHPRIDE Parade. The event was supported by organizations throughout the campus, including housing, the Counseling Center, the College of Arts, Humanities and Social Science; to name a few. The parade route began at Morton Hall and extended across campus by way of the Greenway, all properly socially distanced. Parade "float" (aka golf cart) participants were stationed on the Charger Union Lawns to dispense various prizes during the festivities. To further advocate for the LGBTQ+, the ODEI worked in conjunction with the Counseling Center to create a web page of resources for members of this community and hosted a panel discussion via zoom that enabled staff members, alumni, community members, and students to discuss how they overcame obstacles that stood in their way.



Photo credit: UAH Student Life

## JUBILEE BRIDGE CROSSING

ODEI, Student Life, and Counseling Center personnel worked in partnership to support Black History Month by chartering a bus to provide approximately 35 UAH students with their first Civil Rights trip to Montgomery and Selma. The students began their journey with a visit to the Legacy Museum and Memorial, followed by an unforgettable chance to experience the annual Jubilee Bridge Crossing in Selma where a group of about 525 African American demonstrators crossed the Edmund Pettus Bridge in 1965 to demand the right to vote. The group also had the opportunity to visit the historic Brown Chapel African Methodist Episcopal (AME) Church, the first AME church in Alabama, which was the site of preparations for the march to Montgomery on March 7, 1965, a day that became known as Bloody Sunday.



Photo credit: William Hargrove

# COMMUNITY ENGAGEMENT



As a premier research university, UAH's mission is to "explore, discover, create, and communicate knowledge, while educating individuals in leadership, innovation, critical thinking and civic responsibility, and inspiring a passion for learning." Within this mission lies the responsibility to share our strengths in meaningful and beneficial collaborations with the community through outreach and engagement. These activities are a benefit to our faculty, staff, students and the community.





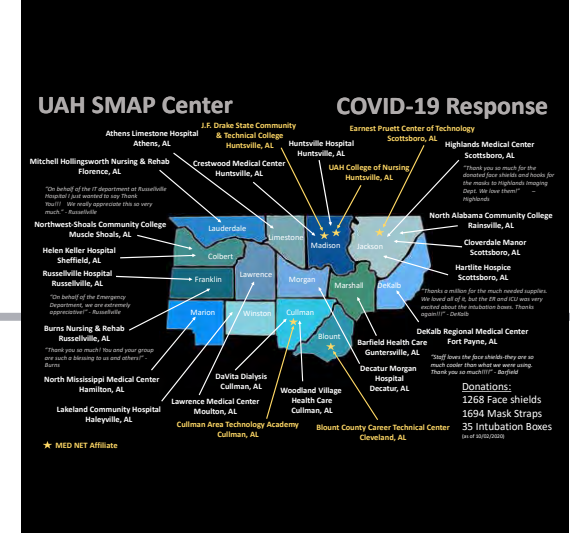
## UAH STUDENT WINS MISS ALABAMA, ENCOURAGES COMMUNITY SUPPORT

Alexandria Flanigan, a UAH pre-law student, was named Miss Alabama USA 2021. Flanigan places a special emphasis on giving back to her community. One of those ways is in supporting causes like Filter of Hope, an organization that helps poor families get filters for clean drinking water. She serves as the pre-law honor society treasurer and is active in the university chapter of the NAACP. The student is especially proud to have won representing her hometown as the first African American Miss Cullman, as she sees her win as a victory for improving race relations and diversity. Flanigan's ultimate dream is to have her own legal practice and offer free legal services to people who can't afford them. "I chose pre-law because I really want to use my career to help people and be a voice for the voiceless," she says.



## SHIFTING CYBER WORLD NEEDS NEW APPROACHES

As the world evolves from power projected by nation-states to power projected in cyberspace, national security requires new models for government in a digital world. That's what Susan M. Gordon, formerly the country's number two ranking intelligence official as principal deputy director of national intelligence, told a gathering of political and defense industry leaders at UAH as part of the University's Distinguished Lecture Series. "The world is changing, and this change is big," Gordon said. "The conflict we are having between our physical world and the digital world is really starting to show how we need to understand this." This series brings nationally recognized guest speakers to Huntsville to enhance community collaboration and foster a better understanding of current events and future trends, as well as how they could influence U.S. reaction to world events.



## SMAP CENTER, CoN PROVIDE COVID ASSISTANCE

The Systems Management and Production (SMAP) Center continues to collaborate with the UAH College of Nursing (CoN) Learning and Technology Resource Center (LTRC) to develop and produce models and devices to enhance nursing education. To meet the challenges presented by COVID-19, the SMAP Center leveraged this partnership to help address shortages and supply chain issues of personal protection equipment (PPE) for medical professionals. The SMAP and other organizations utilized 3D printing to rapidly develop face shields, mask straps, and other devices to combat the pandemic, while the CoN LTRC coordinated and facilitated an organized transfer of these vital pieces of protective equipment to local hospitals and medical centers. In addition, the SMAP Center and CoN LTRC coordinated and assisted other UAH research centers to develop and deliver intubation boxes.





# WORKFORCE DEVELOPMENT

The Career Center is a comprehensive career services office serving current UAH students and alumni in a variety of career-related areas through counseling and programming. The Center focuses on career development and experiential learning to help students find their niche and gain real-world experience in their careers. It builds relationships with employers to create a pipeline of UAH talent.



## CAREER SERVICES i4 PROGRAM

UAH's award-winning i4 program is offered by the Office of Career Services as an innovative way to match students with corporate employers to build relationships in a more meaningful way than that offered by traditional recruiting strategies. The program connects employers that are committed to building a pipeline of talented new hires with students who can benefit from hands-on experience in the professional workplace before graduation. The program is named for its four "intentional" stages: introduce, inspire, integrate, and invest. i4 is unique to UAH and has recently been recognized by the 2019-2020 Alabama Association of Colleges and Employers (AACE) as Educational Program of the Year, as well as the 2019 Southern Association of Colleges and Employers (SoACE) Imaginative Spirit Award.

## UAH SENIOR INTERNS WITH FEDERAL RESERVE

Semaje Kendall, a senior majoring in information systems at UAH, recently completed an internship in St. Louis with the Federal Reserve Bank (FRB). Kendall worked for a division that provided services for the U.S. Treasury. He was assigned a mentor who advised him on the organizational culture and career development at the FRB and ultimately tasked with researching and presenting information on a new file sharing platform that would host confidential information between government agencies and the FED. "I decided to go with UAH because their degree program was perfect for my interest, and the emphasis on career development was appealing," Kendall says. "I was able to directly apply hard skills and knowledge I gained in the classroom to deliver real results on a project working with the Federal Reserve and the U.S. Treasury."

## AEROSPACE STUDENT NAMED CO-OP OF THE YEAR

Kade Owens, a UAH undergrad majoring in aerospace engineering, was the recipient of the 2019-2020 Alabama Association of Colleges and Employers (AACE) Co-Op Student of the Year Award. Owens is a recipient of the Dr. Wernher von Braun Memorial Scholarship and serves as the president of the UAH Office of Career Services i4 Student Organization. "The i4 Program has been a tremendous opportunity for me as a student," Owens says. "Not only did I have the ability to network with representatives from the aerospace industry and experience their day-to-day work life, I also was blessed with an internship that translated into a job with a local engineering firm. I will always recommend this program to anyone enrolled at UAH."



**\$58.7K**

AVERAGE STARTING  
SALARY

—PayScale

**93%**

CAREER OUTCOME  
RATE

**327**

EMPLOYER VISITS TO  
CAMPUS IN AY 19-20

**28,000+**

JOBS POSTED ON  
CHARGER PATH



The background of the page is a photograph of a UAH campus. In the foreground, there are two flagpoles. The left one has the Alabama state flag (white with a red saltire), and the right one has the American flag. A third flagpole to the right has a white flag with the UAH logo and the text 'THE UNIVERSITY OF ALABAMA IN HUNTSVILLE'. In the background, there is a modern building with a curved, grey section and a red brick section. The sky is blue with white clouds.

# ECONOMIC IMPACT

U AH is an economic catalyst for its region and the State of Alabama. The university's economic impact is measured in many ways: by the expanding number of UAH graduates generating profit for their companies or executing essential federal programs; by the discovery of new knowledge, which drives innovation and the creation of new commercial products and services; by the wages and benefits paid by UAH as Madison County's 11th largest employer, greatly contributing to the local and state tax base; and by attracting new companies and talent, resulting in increased economic opportunity for the region.



# \$615M

ANNUAL ECONOMIC  
IMPACT IN ALABAMA

# 73%

UAH GRADUATES  
LIVE IN ALABAMA

# 64

INVENTION DISCLOSURES  
SUBMITTED IN FY 19

## UAH AWARDED \$3.7 MILLION DoD GRANT

UAH was awarded a \$3.7 million Department of Defense (DoD) grant under the Defense Manufacturing Community Support Program (DMCSP) by the Office of Economic Adjustment (OEA). As part of the Alabama Defense Advanced Manufacturing Community (ADAMC), UAH is tasked with utilizing this grant to undertake a \$6.2 million project to focus on the visibility, workforce training, and adoption of advanced manufacturing technologies in the region, with an emphasis on the modernization of aviation, missiles, and ground vehicle systems. The ADAMC comprises 22 counties that focus on supporting and growing the capabilities of the defense industrial base in Alabama. UAH will lead the ADAMC to pull together existing programs throughout the region, as well as establish a facility for the Advanced Manufacturing Innovation and Integration Center in Huntsville.

## CYBERSECURITY ASSISTANCE

Under a new \$500,000 grant from the U.S. Department of Defense (DoD), the UAH Office for Operational Excellence (OOE) will continue to provide small- to medium-sized businesses in Alabama with cybersecurity education and technical assistance to meet new DoD cyber requirements. The OOE program is called ACCESS, which stands for Alabama Cybersecurity Coaching, Education, and Support Services. ACCESS is a partnership between the OOE and the Information Technology and Systems Center to provide education seminars, workshops, and direct technical assistance to help these companies become ready to receive low-cost cybersecurity assistance to progress toward compliance with DoD cybersecurity regulations. Part of UAH's Research Institute, OOE helps government and industry cope with enterprise challenges by providing customers and sponsors with solutions through education, discovery, and innovative supply chain and product lifecycle management.

## HELPING DISADVANTAGED BUSINESSES IMPROVE COMPETITIVENESS

The UAH Mentor-Protégé Program (MPP) helps Disadvantaged Business Enterprises (DBEs) in the highway construction industry improve their business processes, bidding skills, and relationships with Alabama Department of Transportation (ALDOT) prime contractors. The MPP team works to build mutually beneficial relationships between well-established primes (mentors) and DBEs (protégés). By enhancing bid proposal and project management practices, participating firms elevate business maturity, competitiveness, and growth potential. Greater DBE capability means prime contractors are better able to fulfill state-issued DBE subcontracting goals. To date, the program has worked with more than 50 DBE firms statewide.





# GLOBAL IMPACT

**A**s part of its mission to promote global education and understanding, UAH reaches out to form international connections and partnerships with other educational institutions, businesses, and individuals. Likewise, the university works to create and nurture greater connectivity between our local region and the broader world. In these important roles it serves to knit together its community with cultures and opportunities beyond its borders.



## BIOSCIENCE DISCOVERIES

The UAH Department of Biological Sciences and collaborators have shown the strength of research partnerships. Dr. Jerome Baudry, a molecular biophysicist and the Mrs. Pei-Ling Chan Chair in Biological Sciences, partnered with Hewlett Packard Enterprise to use a supercomputer to rapidly identify 125 naturally occurring compounds with promise as COVID-19 treatments. Dr. Baudry's research was awarded one of five 2020 Hyperion High Performance Computing Innovation Excellence Awards from 62 nominations. In separate research, Dr. Eric Mendenhall, a UAH associate professor of biological science, teamed with HudsonAlpha Institute for Biotechnology president Dr. Richard Myers to identify the function of 208 proteins responsible for orchestrating the regulation of human genes. The research was published in Nature in July. "We very much hope to see these collaborations grow in the future," says Dr. Paul Wolf, Biological Sciences chair.

## AIR QUALITY MONITORING FOR THAILAND

Thailand will get help mitigating air pollution from a new satellite data application co-developed by UAH. Air pollution in Thailand becomes a problem when the low temperatures and calm winds during the Asian monsoon dry season mix with air pollution from forest fires and agricultural burning in the Lower Mekong Delta. The new app, called SERVIR-Mekong Air Quality Explorer, enables large-scale monitoring of air quality in the country by using NASA satellite Earth observations and modeled data. Current Thai efforts to monitor air quality rely heavily on ground-based monitoring, which has limited spatial coverage, leading to gaps in essential information. The new app will facilitate quicker mitigation steps and air quality improvements for the entire region. It was cooperatively developed by the UAH Earth System Science Center and the NASA SERVIR Science Coordination Office located in UAH's National Space Science Technology Center.

## HOW COVID TOURISM AFFECTS BELIZE WATERS

A study to investigate how a COVID-19 decline in tourism might reduce human impacts that affect coastal water quality in Belize earned a one year, \$50,000 NASA Rapid Response grant for the associate dean of the College of Science at UAH. The coastal area of Belize includes the largest barrier reef in the northern hemisphere, and the coral reef and marine habitat, and the tourism they attract, are huge sources of revenue for the country. Dr. Robert Griffin, an atmospheric and Earth science professor, was working on a NASA project to study the reef's health when the advent of COVID-19 provided the water quality research opportunity. Under the grant, Griffin and his team are studying how decreased tourism impacts urban and agricultural point and nonpoint sources of water pollutants.





# CAMPUS INFRASTRUCTURE

U AH's infrastructure provides a safe and nurturing educational environment where technology and human understanding converge. It evolves, improves, and grows to enhance the university community's ability to solve complex problems and develop a passion for improving the human condition. It serves UAH's mission of educating individuals in leadership, innovation, critical thinking, and civic responsibility and inspiring a passion for learning.





## CYBERSECURITY LAB OFFERS KEY ADVANTAGES

This state-of-the-art lab will provide students studying cybersecurity with a high-tech, hands-on learning experience that will allow them to gain real-life experience and a key advantage as they enter the workforce upon graduation. The lab will leverage the specialized cybersecurity programs in the College of Business to train students to become well-rounded professionals with the knowledge and expertise to secure and defend businesses and organizations against cybersecurity threats. Updates to the facility include renovation of four existing spaces in the Business Administration Building to create a new 1,906-square-foot Cybersecurity Lab specifically designed to accommodate a collaborative learning environment for 60 students featuring industry leading audio, visual, and instructional technologies.



## MORTON HALL REOPENS WITH 21ST CENTURY FUNCTIONALITY

Morton Hall, the cornerstone of the UAH campus, reopened this past fall after undergoing a multi-year renovation and expansion project. The original building, comprising 72,000 square feet, was completely reimagined and received a two-story expansion as well to increase the total area to roughly 118,000 square feet. The extended floor plan features shared common areas and study spaces for Charger students and supports 32 classrooms, seminar rooms, five classrooms with tiered seating, a lecture hall with a capacity for 124 students, 130 offices for faculty and staff, and a Black Box Theatre that provides the flexibility for intimate and experimental productions. "Faculty and students have said moving into the new facility has made them excited about the future," says Dr. Sean Lane, Dean of the CAHS.



## SIGNIFICANT RENOVATIONS TO SPRAGINS HALL

Spragins Hall received extensive exterior renovations to refurbish the maintenance, appearance, and functionality of the facility. Upgrades were needed to replace exterior masonry that had developed problems on the building's west side. The exterior was enhanced by removing and replacing the aging brick veneer with the installation of an alternative veneer consisting of a metal cladding system. To ensure the quality and long-term stability of the exterior of the facility, other repairs were performed to replace sheathing, blocking, and flashing while creating a waterproof seal. Various plumbing and electrical repairs were made as well to address and mitigate water infiltration. Additional renovations are slated to begin in 2021, including substantial interior renovations and providing new exterior building signage, as well as landscape and hardscape improvements.



A photograph of three baseball players in blue and white uniforms celebrating on a field. The player in the center, wearing a jersey with 'Chargers' and the number 3, is raising his blue batting helmet. To his left, another player with the number 9 on his back is also raising his helmet. A third player is partially visible behind them. On the right, an umpire in a black uniform and cap is walking. The background shows a blurred stadium setting with a blue fence.

# ATHLETICS

Photo credit: Chuck Edgeworth



## BASKETBALL

The 2019-2020 UAH Men's Basketball team won the Gulf South Conference (GSC) tournament and advanced to their 9th NCAA tournament in the last 11 years. The tournament was cancelled due to COVID-19.

The 2019- 2020 UAH Women's Basketball team advanced to the NCAA tournament for the first time since 2013. The tournament was cancelled due to COVID-19.

## CROSS COUNTRY

The 2020 UAH Men's Cross Country team won the GSC Championship and won the National Invitational Meet as well to complete an undefeated season. The team finished #3 in the National Coaches Poll.

## LACROSSE

The 2020 UAH Women's Lacrosse team was in first place in the GSC when the season was cancelled due to COVID-19.

## SOFTBALL

The 2020 UAH Softball team was in first place and ranked #25 in the country when the season was cancelled due to COVID-19.

## BASEBALL

The 2020 UAH Baseball team was in first place and ranked #12 in the country when the season was cancelled due to COVID-19.



Photo credit: Chuck Edgeworth





# ALUMNI

Among UAH's more than 43,000 alumni are astronauts, scientists, professional athletes, nurses, educators, entrepreneurs, artists, and some of Huntsville's most influential leaders. With their creativity, innovation, and determination, our alumni are supporting UAH's mission of leadership in research, scholarship, and creative achievement and are shaping the future of our community and the world.





## KATHY CHAN

Internationally renowned artist Kathy Chan ('79 BA Modern Foreign Language, '81 BA Arts) created a new work she hopes will inspire UAH Art and Music students and faculty for many years to come. Her new piece is a painted violin that features the motif of a flowering plant rising from a stylized bowl into a delicate filigree of leaves and blossoms. The painting is complemented by an arrangement of the artist's signature hand-selected jewels. Chan was inspired to create the work through the way she experienced music living in China, Brazil, Turkey, and various locations all over the U.S. "I found that with music, even if it's very specific to the region, it is still really universal," the artist says. "You don't have to speak the language to enjoy it. So I gave this work the name 'Music, Music, Music, the Emperor of Universal Language.'"



Photo credit: NASA/Emmett Given

## DAVID E. HOWARD

David E. Howard ('78 BS Electrical Engineering, '80 MS Control Engineering) has been inducted into the NASA Technology Transfer Program's Inventors Hall of Fame. Howard worked as a civil servant at MSFC for 34 years, and his inventions range from instrument and motor controls and signal conditioning electronics, to projects that have provided numerous benefits to critical NASA missions, such as electromechanical actuators for thrust vector control for the International Space Station. "I have been fortunate to support a number of flight hardware programs that I was able to see through the inception, design, manufacturing, testing, and flight support," he says. "Several of these designs were part of the Environmental Control and Life Support System for the International Space Station." The inventor's ingenuity has garnered nearly 20 patents.



Photo credit: Missile Defense Agency

## SHERY WELSH

Dr. Shery Welsh ('14 PhD Materials Sciences) is Director, Air Force Office of Scientific Research in Arlington, Virginia. She oversees a staff of 200 scientists, engineers, and administrators, not only in the U.S., but also foreign technology offices in London, Tokyo, and Santiago, Chile, while managing a yearly basic research portfolio of nearly half a billion dollars. The goal of this organization is to locate and transition cutting-edge basic research for the Air Force Research Laboratory and other Department of Defense elements. "This is already one of the most thrilling jobs I have ever had," Dr. Welsh says. "I can't think of anything more fun or critical than basic research." These projects include areas such as COVID-19 research on potentially using microwaves to clear hospitals and other environments of the virus to create contagion-free workspaces, saving lives.



# 2020 ALUMNI OF ACHIEVEMENT AWARD WINNERS



The Alumni of Achievement Award is the highest honor bestowed by the UAH Alumni Association. The award recognizes graduates who have distinguished themselves professionally and personally and who exemplify the high standards of UAH. A committee selects the winners from nominations made by alumni, faculty, staff, and friends.



### **Dr. Jessica Gaskin ('04 PhD Astrophysics)**

Dr. Gaskin has been with NASA for more than 20 years. She has been a Research Astrophysicist with the X-Ray Astronomy Group since 2005 and has worked on numerous NASA projects over her professional life, including leading multiple large to small projects across the fields of x-ray and gamma ray high-energy astrophysics and planetary science. She has won over a dozen NASA and industry awards and has authored or co-authored over 90 publications with an emphasis on x-ray astrophysics and instrumentation.

### **Eric Grigorian ('83 BS, '87 MS Electrical Engineering)**

Grigorian works at PEO Aviation developing advanced technologies for Enduring and Future Vertical Lift aircraft. He has been Director of Engineering and Manufacturing for Yulista Aviation; Vice President of Engineering and Manufacturing for AAR Integrated Technologies; Chief Engineer and Vice President of Applied Data Trends; Director of Computational Competency Center for Z/I Imaging; Executive Manager for Intergraph Corporation; and Vice President and Chief Operating Officer for Q-PC, Inc. Grigorian has volunteered since 1982 with the Institute of Electrical and Electronic Engineers.

### **Dr. Lynn Hogan ('99 MS Nursing Administration, '08 DNP)**

Dr. Hogan has served as the Nursing Department Chair at Calhoun Community College since 2011 and has 18 years' experience in acute-care nursing and 16 in higher education. She has been the Administrator for the RN and LPN nursing programs on both the Decatur and Huntsville campuses, supporting a student enrollment of 450. The licensure pass rates under her watch over the last five years have exceeded state and national averages, and she led a successful program accreditation effort in 2020.

### **Andy Kattos ('92 BBA Finance)**

Kattos has served as Huntsville President and Chief Executive Officer of ServisFirst Bank since 2006. His group has grown the Huntsville branch to become the third largest bank in Madison County. Kattos has supported the National Children's Advocacy Center, the Huntsville Hospital Foundation (HHF), the Huntsville Library Foundation, the Suzanna Wesley Early Education Ministry (SWEEM) at First United Methodist Church, the American Cancer Society, the Development Council and Leadership for Huntsville/Madison County, and the UAH College of Business External Advisory Board.

### **Gerry Schaffer ('76 AA Interior Design, '80 BA Art History)**

Schaffer started her own design business that blossomed into a 28-year career. She has also supported the Women's Guild of the Huntsville Museum of Art, the Huntsville Symphony Orchestra Board of Trustees, Scenes of the Holidays, the American Association of University Women, Soroptimist International, the Land Trust, the Huntsville Botanical Garden Guild, and the Huntsville Arts Council, totaling over 15,000 hours of service, earning her the Virginia Hammill Simms Award for individuals contributing to the arts in the Huntsville/Madison County community.

### **Taylor Whisenant ('14 BA Education, '16 ME Differentiated Instruction)**

Whisenant's career has focused on elementary education with an emphasis in collaborative special education with Autism Spectrum Disorders (ASD). She has been a science, collaborative, and robotics teacher at Arab Junior High School where she taught Earth and Space Science to sixth-grade students. She currently works with third grade students at Lynn Fanning Elementary, where she teaches math, science, and social studies. Whisenant also helps administrate the For Inspiration and Recognition of Science Technology (FIRST) Lego Robotics competitions for the state.

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### **2020 Outstanding Young Alumni of Achievement Award Winner**

The Outstanding Young Alumni of Achievement Award was created in 2018 and is presented to a UAH alumnus/alumna who is 40 years of age or younger. The recipient must have shown outstanding achievement in his/her profession or field, demonstrated exemplary service to the community, and supported the university in meaningful ways.

### **Toyin Ojih Odutola ('08 BA Studio Art and Communications)**

Born in Ife, Nigeria, Odutola is internationally known for creating multimedia drawings that explore formulaic representations. Her work has been exhibited in New York at the Drawing Center, the Whitney Museum, the Studio Museum Harlem, and the Brooklyn Museum, as well as the Contemporary Art Museum in St. Louis, the Aldrich Contemporary Art Museum in Connecticut, and the Menil Collection in Houston. Odutola recently exhibited an imagined ancient myth, an installation called "A Countervailing Theory," in London at the Barbican Centre.






# UNIVERSITY ADVANCEMENT

**A**s educators and researchers, our faculty shape the future. They bring passion and insight to fuel the minds of tomorrow's thought leaders and innovators. Their discoveries sit at the forefront of science and engineering while addressing our world's most pressing issues, like climate change and cybersecurity. Thanks to the philanthropic support from our community and corporate partners, we have and will continue to recruit and retain these bright minds to build a brighter future.





Our students are the beating heart of UAH. They are our mission. However, many of them encounter financial obstacles in their path towards a degree and could not be here without a scholarship. Gifts of all levels have enabled us to provide these critical scholarship funds to diminish and remove those barriers, so UAH scholars can achieve and exceed their highest aspirations.

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