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University of Alabama in Huntsville

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THE UNIVERSITY OF ALABAMA IN HUNTSVILLE

/ President's Annual Report 2018 /



5 RESEARCH PROGRAMS RANKED AMONG THE TOP 25 IN THE NATION

– NATIONAL SCIENCE FOUNDATION

1ST

IN ALABAMA

ENVIRONMENTAL SCIENCES INCLUDING
ATMOSPHERIC SCIENCES, MATH & COMPUTER
SCIENCES, AND PHYSICAL SCIENCES

– UAH OFFICE OF RESEARCH & ECONOMIC DEVELOPMENT

2ND

IN ALABAMA

FEDERALLY FUNDED
RESEARCH EXPENDITURES

– UAH OFFICE OF RESEARCH & ECONOMIC DEVELOPMENT

EXPANDING HORIZONS

\$94 MILLION

IN RESEARCH EXPENDITURES

UAH RATED AS VERY COMPETITIVE

– BARRON'S PROFILE OF AMERICAN COLLEGES

ONE OF
**AMERICA'S 100
BEST COLLEGE BUYS**

– INSTITUTIONAL RESEARCH
AND EVALUATION INC.



#1 BEST VALUE IN ALABAMA

– SmartAsset

UAH RANKS 1ST AMONG ALL ALABAMA SCHOOLS

based on the economic outcomes of its graduates according to
the Brookings Institution, a respected Washington D.C. think tank.



THE UNIVERSITY OF
ALABAMA IN HUNTSVILLE

THE UNIVERSITY OF ALABAMA IN HUNTSVILLE ADMINISTRATION

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UAH launched its Distinguished Lecture Series in 2018, bringing world-renowned thought leaders and topic experts to the community. The first speaker was Gen. Michael Hayden, former director of the CIA and the National Security Agency, who addressed the changing world order. James Clapper, former director of National Intelligence, also appeared on campus, and a third event in the series featured a debate with noted climate scientists Michael Mann of Penn State and UAH atmospheric scientist John Christy.

The Distinguished Lecture Series elevated UAH to a leadership role by joining the region's best minds with these experts to discuss insights regarding the community's economic thrusts – global and military affairs, homeland security, the intelligence community, future technologies, and advanced scientific concepts.



Many of you are aware of my fondness for quoting Yankee catcher Yogi Berra. One of his oft-cited malapropisms, "It's like déjà vu all over again," seems appropriate for 2018.

For the fourth straight year, we have established a new record for students enrolled at UAH — more than 9,700 students for the fall semester of 2018. We're quite proud of their scholastic achievements as well. This freshman class scored an average of 28.5 on their ACT examination — highest among Alabama's public universities. Forty-five percent scored 30 or higher on the ACT, and a similar percentage had a 4.0 high school GPA.

We anticipate that the enrollment in the fall of 2019 will top 10,000 students, a major milestone for this university and quite an achievement for the faculty and staff who have worked very hard in generating this success.

► The past year marked numerous advances for the campus. We are continuing to have a significant presence of research disciplines ranked in the top 25 by the National Science Foundation. We also held ribbon-cutting ceremonies for a new residence hall and a sorority house. Construction continued on a technology business incubator and plans are being developed for a future "town center" for the UAH campus.

The latest survey of federally financed research expenditures released by the

2018: It was a very good year

National Science Foundation reveals UAH continues to be prominent among programs to be ranked among the top 25 in the nation. Aeronautical and astronautical engineering continues to be UAH's highest ranked research discipline, placing fifth in the United States. UAH had high placement in other programs — 9th in economics, 10th in computer sciences, 12th in atmospheric science, and 21st in astronomy. UAH also ranks among the top research universities nationally among two federal agencies — 11th in NASA-sponsored research and 28th among Department of Defense-sponsored research.

Our researchers also perform cutting-edge research for the National Science Foundation, the National Oceanic and Atmospheric Administration, the Department of Energy, and the National Institutes of Health. Our university's colleges and research centers partner in many areas, working together to educate and inspire tomorrow's leaders, discover new knowledge, and create solutions to address many of society's toughest challenges.

► 2018 saw the opening of a new residence hall. Ribbon cutting for a sorority house. Continued construction on a technology business incubator. Continued advance of planning a future "town center" for UAH.

More than 400 additional students found a place to sleep on campus this past year following the completion of the second phase of Charger Village on the south end of campus.

This brings the total number of beds on campus to more than 2,000, a significant step toward UAH becoming more of a residential campus and adding to an already vibrant campus life.

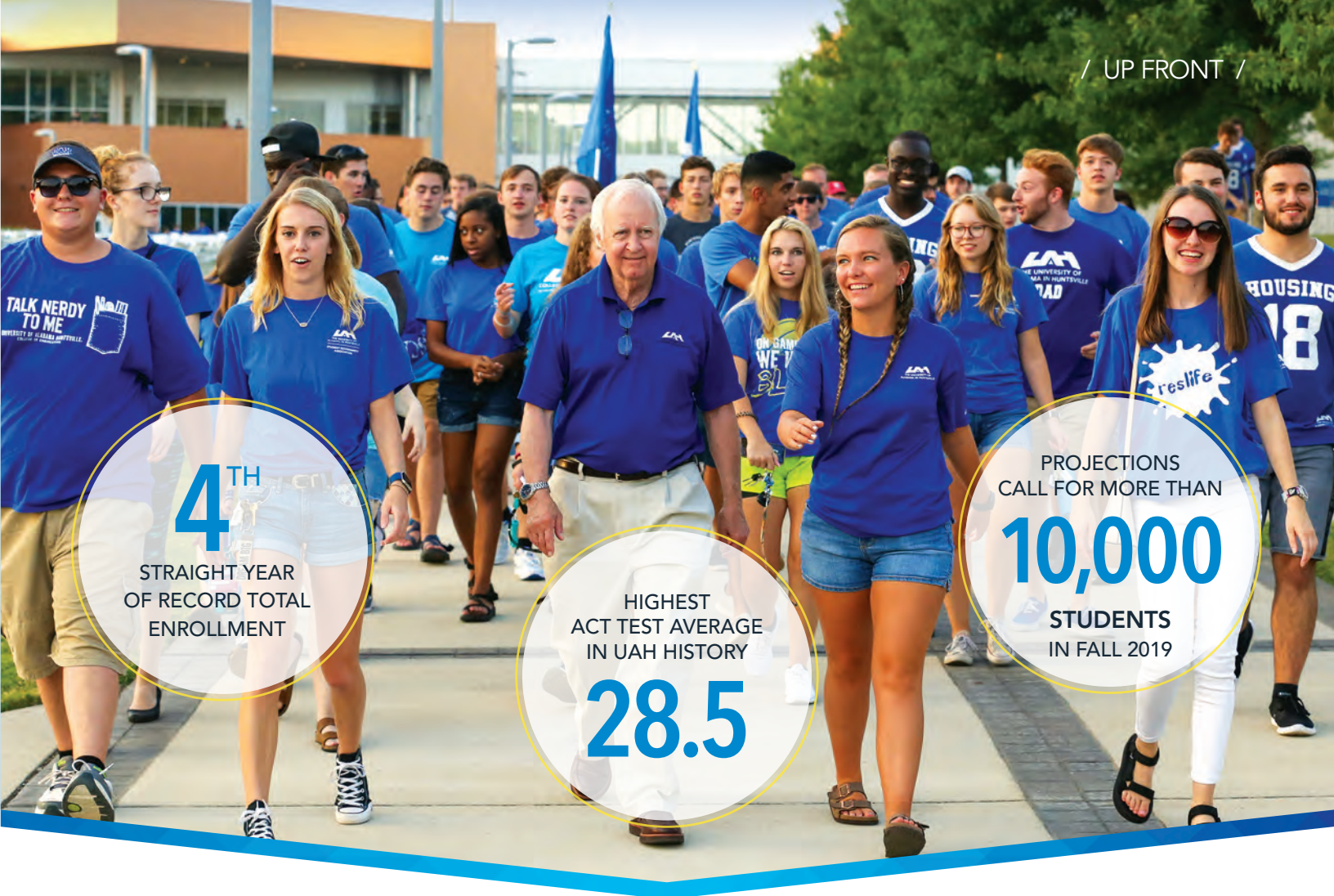
Along those same lines, we welcomed our sixth Greek House on campus with the opening of the Alpha Omicron Pi sorority house. AOPi established its Delta Tau chapter on the UAH campus in 2011 and now has a home to call its own.

► Construction continues on the Invention to Innovation Center (I²C). The I²C is a regional initiative that fosters, promotes, and accelerates commercialization of technology-based ventures through incubation, co-working, mentorship, funding, and strategic support. The building should be opened in the next couple of months.

► Finally, we purchased a large tract of land across Sparkman Drive from the campus in 2017. It's the site of a former office complex called Executive Plaza. We have since engaged an architecture and design firm, Perkins+Will, to develop a master plan for a mixed-use development offering retail, housing, and office space to complement our campus as well as space for UAH expansion. A five-acre tract of wetland in the middle of the development will serve as aesthetically pleasing space for a UAH "town center."

"IT'S LIKE
DÉJÀ VU
ALL OVER
AGAIN."

- YOGI BERRA

4THSTRAIGHT YEAR
OF RECORD TOTAL
ENROLLMENTHIGHEST
ACT TEST AVERAGE
IN UAH HISTORY

28.5

PROJECTIONS
CALL FOR MORE THAN

10,000

STUDENTS
IN FALL 2019

▶ LEADING THE CHARGE ◀

The University of Alabama in Huntsville (UAH) reported record student enrollment for the fall 2018 academic term. This achievement marks the fourth straight year of record enrollment for the campus.

Total enrollment was 9,736 students, an increase of 7 percent when compared to the fall 2017 enrollment of 9,101. The freshman class comprises 1,428 students – the largest in UAH's history and up 6.2 percent compared to the same numbers last year. This incoming class also scored a record average of 28.5 on their ACT, up from 27.9 a year ago.

Other distinguishing characteristics of this year's freshman class include an overall high school GPA of 3.88, with 45 percent scoring 30 or higher on the ACT, and 45 percent with a high school GPA of 4.0 or higher.

Retention also remains at historically high levels, topping 83 percent for 2018.

During the past four years, total enrollment has increased 32.5 percent, from 7,348 in the fall of 2014 to 9,736 this year, while the freshman class has doubled, from 714 in 2014 to 1,428 in 2018. Enrollment growth has been consistent with

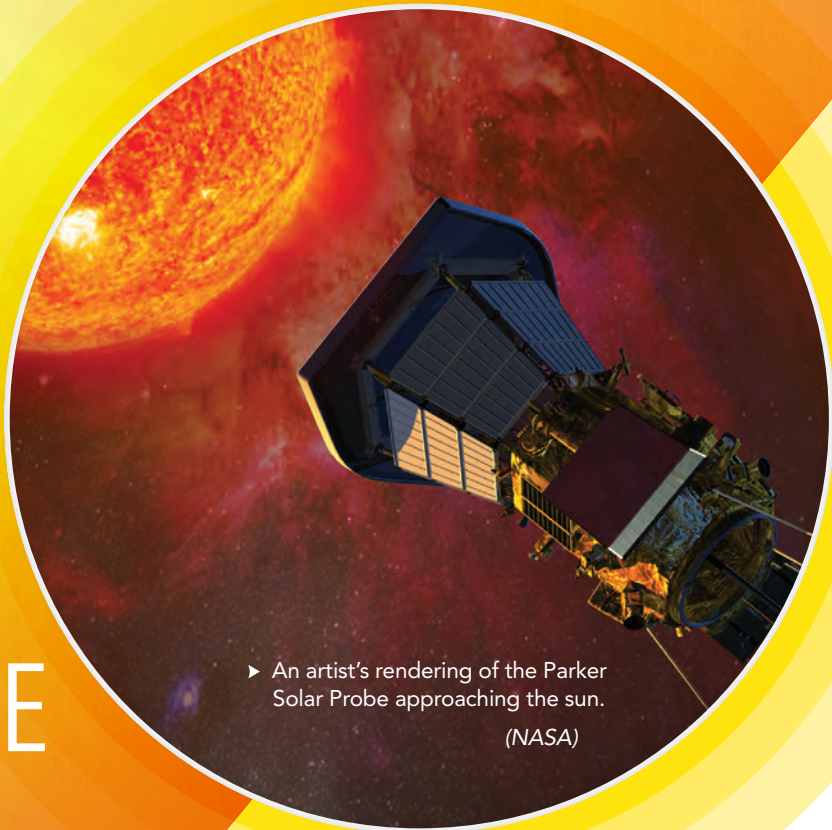
more than 7 percent growth annually since the fall of 2014.

The university projects five consecutive years of enrollment growth in the fall of 2019. Using a 7 percent rate of growth, projections call for a total enrollment of 10,418 students for the fall of 2019.

"It's becoming increasingly important that students view their choice for college as an investment. Prospective students are coming to realize that a diploma from UAH provides them with great value," says UAH President Robert Altenkirch. "The quality of our faculty and the opportunity to conduct hands-on research and gain practical experience through internships enhances their knowledge and helps develop their skills. UAH students are very well prepared upon graduation and are highly qualified to enter the workforce."

UAH is also recognized for its academic quality and research opportunities for its students. The campus is considered very competitive by Barron's Profiles of American Colleges, one of only two public universities in Alabama with that distinction. UAH also has five programs ranked in the top 25 in the nation by the National Science Foundation.

FLYING CLOSE TO THE SUN



► An artist's rendering of the Parker Solar Probe approaching the sun.
(NASA)

UAH is playing a major role in analyzing the data from NASA's Parker Solar Probe (PSP) mission, on which the university also has a collaboratively built instrument.

"It will be the first in situ exploration of the atmosphere of a star," says Dr. Gary Zank, director of UAH's Center for Space Plasma and Aeronomic Research, Chair of the Department of Space Science, and Aerojet Rocketdyne Chair in Space Science.

Launched Aug. 12 from Cape Canaveral Air Force Station in Cape Canaveral, FL, PSP's mission is to inform the physics underlying the atmosphere of the sun and the corresponding physics of all stars that are like the sun.

Aboard is a Faraday Cup instrument designed, created, and tested by UAH, Marshall Space Flight Center (MSFC), and the Harvard Smithsonian Astrophysical Observatory (SAO) to sample the solar wind while exposed directly to it, traveling closer to the sun than spacecraft from Earth have ever been. The cup is part of the Solar Wind Electrons Alphas and Protons (SWEAP) instrument array and will directly

collect charged particles that comprise the solar wind as the spacecraft travels through coronal gases super-heated to temperatures greater than 1 million degrees K (1.8 million degrees F).

Also aboard as part of SWEAP are two solar probe analyzer instruments known as SPAN-A and SPAN-B. The SPAN devices collect particles and sort them through a series of deflectors and voltages based on their mass and charge. SPAN-A measures electrons and ions, while SPAN-B is dedicated to electrons only.

In November, PSP made its historic first daisy-petal-like loop through the sun's corona, boosted via a Venus fly-by. It was an important milestone

for the craft's ground-breaking seven-year effort to better understand the nature of the star responsible for life on Earth.

Scientists are now "getting down to the nuts and bolts of the project," says Dr. Zank. "We're busy further developing our theoretical models and predictions, and preparing the models to see how closely they align with the anticipated observations." To that end, UAH postdoctoral research assistant Laxman Adhikari, research scientist Lingling Zhao, and space science student Yu Chen will soon travel to SAO to begin initial analysis of returned data from humankind's ambitious mission to the solar corona.

A team of astrophysicists that includes Dr. Gary Zank was awarded \$496 million by NASA's Solar Terrestrial Probes Program to fund the Interstellar Mapping and Acceleration Probe mission concept. In keeping with the priorities outlined in the National Research Council's "Decadal Strategy for Solar and Space Physics," the mission will seek to advance critical scientific objectives of understanding our home in the galaxy, contribute to the fundamental understanding of the sun-Earth system, and produce secondary observations critical to space-weather related societal needs.

WELCOME TO THE FUTURE

UAH's internet-connected Yamaha Disklavier is revolutionizing piano instruction



Alabama State Representative and UAH alumnus Phil Williams presents a \$10,000 grant to Dr. C. Dave Ragsdale, chair of UAH's Department of Music, in support of the university's internet-enabled Yamaha Disklavier piano. Faculty member Dr. Ka Man "Melody" Ng is shown in the photo along with Dr. Sean Lane (far right), dean of UAH's College of Arts, Humanities, & Social Sciences.

This fall, UAH's Department of Music showed the world how cutting-edge technology is fundamentally changing the way students learn piano by becoming the first U.S. university to connect an internet-enabled Yamaha Disklavier CFX concert grand piano with a counterpart in Beijing, China.

During the event, Dr. Ka Man "Melody" Ng, assistant professor of piano at UAH, instructed students in Roberts Recital Hall on the UAH campus by playing a Disklavier CFX piano in Beijing while UAH's Disklavier CFX piano recreated the performance in real time, with the instrument's keys and pedals moving up and down. Dr. Ng, in Beijing, and the students, in Huntsville, were then able to converse about the lesson over video chat, performing back and forth to one another as if they were sitting on the same piano bench in the same room.

"This historic exchange created an amalgamation of arts and technology through the language of music, bridging cultures and people beyond borders," says Dr. Ng, who was joined in Beijing by Dr. C. Dave Ragsdale, chair of the Department of Music. Like her, he was also moved by the transcendent nature of the event, which he describes as not just "connecting musical instruments around the world, but also connecting humans to one another through music." The result, he says, "is the future of music education, and UAH is leading the way."

The piano was acquired last year to celebrate the Department's 50th anniversary and is dedicated to enhancing

the university's distance-learning opportunities through its remote-lesson capability. This advanced technology enables highly nuanced performance data – the actual keystrokes and subtle pedal movements made by a performing artist – to be transmitted back and forth between similarly equipped instruments over the internet, with perfectly synchronized video streaming between the two locations. Thus, as an artist performs on a Disklavier in one location, the remotely connected Disklavier in a different location recreates the performance in real time, with the instrument's keys and pedals moving up and down, capturing the subtlest nuances.

With this remarkable distance-learning capability, UAH can now conduct transcontinental piano lessons, master classes, and performances between two internet-connected Disklavier pianos, enabling students to receive instruction remotely from top international artists and educators located throughout the country and around the world.

"The acquisition of the Yamaha Disklavier CFX uniquely fits our mission – and the DNA of the university and our community – by grounding our music students in a traditional music education with a technological thrust to fully equip them for 21st-century careers," says Dr. Ragsdale. "And while Huntsville is 'the Rocket City,' it's also bubbling with art enthusiasts and music lovers. With the technology side of music becoming the calling card of the Department of Music, we can deliver quality programs in the sciences and the arts to our students and our community."

TAKING COMMERCE TO THE COSMOS

Welcome
to the
**11th Annual
Wernher von Braun
Memorial Symposium**
– Galvanizing U.S. Leadership in Space –



► Robert Altenkirch
and NASA MSFC
Director Jody Singer

"Galvanizing U.S. Leadership in Space" was the theme of the American Astronautical Society's 11th annual Wernher von Braun Memorial Symposium, held last fall on the UAH campus and hosted by the university in partnership with NASA Marshall Space Flight Center (MSFC).

Speakers at the event included Jody Singer, director, NASA MSFC; Harrison "Jack" Schmitt, Apollo 17 Astronaut (Ret.), U.S. Senator (Ret.); John Elbon, Chief Operating Officer, United Launch Alliance; and Josh Brost, Senior Director, Government Business Development, SpaceX; among other pioneering thought leaders in the space industry. Dr. Michael Griffin, undersecretary of defense for research and engineering, delivered the keynote address at the National Space Club's 30th annual Dr. Wernher von Braun Memorial Dinner, which took place at the U.S. Space & Rocket Center's Davidson Center for Space Exploration.

SAFETY MATTERS

UAH was chosen by the Defense Security Service to receive the **2018 James S. Cogswell Outstanding Industrial Security Achievement Award**, the only institution of higher learning in the nation to be selected for the honor. "This recognition from one of the nation's leading agencies providing oversight for America's security operations is quite an accomplishment for UAH and our team of security professionals," says UAH President Robert Altenkirch. Only 39 organizations nationwide were selected for this year's award from the approximately 13,300 cleared facilities subject to recurring assessment.



◀ Apollo 17 astronaut (ret.) and moon walker **Harrison "Jack" Schmitt**

In conjunction with the symposium and in keeping with its theme, UAH's College of Business held a successful inaugural Space Commerce workshop. "It is part of our strategic priority in the College of Business to advance space commerce through research, community engagement, and academic programs," says Dr. Jason Greene, dean of the College. "This event was well received, with approximately 250 attendees."

Kevin O'Connell, director of the U.S. Department of Commerce's Office of Space Commerce, delivered the workshop's keynote speech, which focused on regulatory and policy issues that are actively being pursued by the U.S. government in an effort to support an environment of growth for space commerce. The event also included a diverse panel of experts from NASA, the business community, academia, and government who shared their perspectives about the business challenges and opportunities facing the global space commerce industry.

"We plan on building on the interest and success of this workshop for future years," says Dr. Greene. "We expect to offer such a workshop annually as a way to bring diverse perspectives together to address business challenges as space commerce continues to grow."

ALL SYSTEMS GO

I²C's interim location at Executive Plaza nearly doubles in size



As construction of its 45,000 square-foot permanent location on the UAH campus continues, the Dorothy S. Davidson Invention to Innovation Center (I²C) has expanded its interim Proof of Concept Center (PoCC) at the former Executive Plaza site across from UAH on Sparkman Drive from 4,600 square feet to roughly 7,500 square feet.

The I²C has added three new companies to its roster, which now totals 17 firms between its PoCC and Virtual Incubation programs, thereby extending the I²C entrepreneurial ecosystem to entrepreneurs and technology-focused startups geographically located outside the Huntsville region.

In addition, the I²C PoCC facility now has an area dedicated for U.S.-specific projects. "This is extremely relevant to our companies looking to serve government customers on projects sensitive to national security," says Rigved Joshi, I²C director, who is actively cultivating a pipeline of new companies that have expressed interest in incubation services at I²C.

"This includes technology companies from out of state or out of the country that want to establish a presence in Huntsville and want to partner with I²C as a 'soft-landing' destination."

Established partnerships include one with the European Space Agency through the Huntsville-Madison County Chamber of Commerce to support soft-landing opportunities for aerospace startups.

I²C is also working with the North Alabama International Trade Association, a business-driven organization committed to increasing knowledge, interest, and activity in international trade in North Alabama, to establish similar programs to incubate foreign technology startups.

"As we continue to gain momentum, the success of I²C depends on how effectively we work with our partners collaboratively, drawing upon each other's strengths for one single purpose: to provide the best resources, education, mentorship and support to our entrepreneurs," Joshi says.

The I²C's permanent home is expected to open early this year.

UAH has chosen Perkins+Will, an interdisciplinary, research-based architecture and design firm, to handle the master-plan development for a 58-acre expansion of the university across Sparkman Drive. The property, which was purchased by UAH in 2017, has the potential to become a "town center" for the campus, according to UAH President Robert Altenkirch. Plans include a mixed-use development comprising retail establishments, restaurants, offices, and housing, as well as space for the university to expand. Two large ponds and the mature growth trees at the property's center will create an aesthetically friendly town center.



NEW ADDITIONS

RIBBON-CUTTING CEREMONIES WERE HELD DURING UAH'S HOMECOMING CELEBRATION IN LATE OCTOBER FOR TWO NEW BUILDINGS ON CAMPUS: THE CHARGER VILLAGE II RESIDENCE HALL AND THE ALPHA OMICRON PI SORORITY HOUSE.

CHARGER VILLAGE II

Located next to the original Charger Village, the new residence hall was completed over the summer and received occupancy certification in August.

Charger Village II is considered a traditional suite-style residence hall, with each suite comprising a common area with kitchenette, two bathrooms, and two to four bedrooms. Each bedroom is furnished with a twin extra-long loft-able bed, a four-drawer dresser that can be converted to a pair of two-drawer dressers, a desk with a task chair, and a built-in closet. The building also features five kitchens (one per floor) and 10 laundry rooms (two per floor), and includes utilities, cable, and campus internet.

With this additional residence hall, UAH's Housing & Residence Life is now able to house a little over 20 percent of the student population on campus.



ALPHA OMICRON PI

The new residence joins five other sorority and fraternity houses on UAH's Greek Row.

"The house dedication was a way for our chapter to solidify our presence on campus, showing our intent to continue our history of philanthropy and sisterhood at UAH," says Amy Symmonds, president of UAH's Delta Tau chapter. "And the chapter absolutely loves the house, which has helped us grow closer as sisters. We are able to have ritual, recruitment, and everyday activities in a place that we can call our own."

Alpha Omicron Pi was founded in 1897 at Barnard College of Columbia University in New York City. The ideals of sincerity, service, and friendship provide the foundation for the sorority. The Delta Tau chapter was established at UAH in 2011 and serves as host of "Smoke Out Arthritis," a popular annual fundraiser.



CATHERINE HENDERSON and **RYAN FERNANDEZ** were part of a team of interns to win Booz Allen Hamilton's 2018 Summer Games. Their entry, an unmanned



Photo credit: Booz Allen Hamilton

aviation system dubbed "the Yellowhammer," took the top spot by integrating machine-learning algorithms and intelligence capabilities in a transportable and easy-to-assemble package. "No matter who we're helping, the Yellowhammer saves time, money, and – most importantly – lives," says Fernandez, an electrical and computer engineering major. Not to mention, adds sophomore industrial and systems engineering major Henderson, "with a 3-D printed frame and print-on-demand replacement parts, the Yellowhammer is cost effective and can be snapped together in less than four minutes." As the winners of the Challenge Cup, the pair is now eligible for additional funding and firm support to evolve the Yellowhammer into an end-to-end solution designed to give military commanders an easy way to track real-time and open-sourced information about developing situations. "Winning was amazing," says Henderson, "but the fact that we were able to design and create a product that can be used beneficially by others someday is what made it worth it."

Engineering majors **JAMES TOVAR, MARQUIS MYLER, NICHOLAS "GAGE" SWINFORD, MARTAVIA LUCIOUS,** and **ANDREW FARRIS,** and computer science major **MATTHEW DAIGLE** put their 3-D printing skills to use this summer

as interns with UAH's Systems Management and Production (SMAP) Center. Under the guidance of research scientist Norven Goddard and at the request of

clinical associate professor of nursing Dr. Lori Lioce, the students were able to create a selection of affordable task trainers, clinical simulators that allow nursing students to repeatedly



practice a specific skill in preparation for providing healthcare in the real world. "These models cost more than a thousand dollars," says Goddard, "but we wanted something that would save money, be cost effective, and use

the university's resources." Their success now has Dr. Lioce looking into ways she can not only formalize the relationship between the SMAP Center and the College of Nursing going forward, but also

expand it. "Diversity of thought and science stimulates needed growth and solutions," she says. "It's precisely because we think differently that we are innovative together."



SHRUTI SHRESTHA, a Ph.D. student in UAH's graduate program in Biotechnology Science and Engineering, participated in a collaborative project with the Powers Research Group at Vanderbilt University to study pancreatic islet dysfunction in patients with type 1 diabetes (T1D). "They were using a novel approach to investigate pancreatic tissues and isolated islets from the same T1D patient to study their functional and molecular features," say Shrestha. Since she had previously received training in single-cell gene expression as a graduate research assistant in the Genomic Services Laboratory (GSL) at the HudsonAlpha Institute for Biotechnology, Shrestha says she was able to contribute her RNA-sequencing expertise to learn the features of islets from T1D patients at a genetic level with the help of experts in the GSL. The study's findings were published last spring in the journal "Cell Reports," with Shrestha serving as first co-author on the paper, "α Cell Function and Gene Expression Are Compromised in Type 1 Diabetes." Her collaboration with her co-authors, however, is still not over. "I'm taking this project a little further by looking at genes expressed on a single-cell level," says Shrestha. "It's a new technology and has been widely applied to studying genes expressed in single cells of normal and diseased tissues in the body. My hope is that I can leverage this technology to understand the fundamental biology of pancreatic islet cells at high resolution."



In addition to pursuing a master's degree in human resource management from UAH's College of Business, **CARLA ELLIS** is also the vice president of employee relations for Huntsville startup Morph. "Our objective is to help businesses retain their employees by acclimating new residents to a city – we focus on what happens beyond the cubicle so your HR department can focus on what happens at work," says Ellis. As the only woman in the company, however, she is aware that she needs to make sure her voice is heard as Morph goes from being a startup to an established business. "While I'm opinionated, I usually leave decisions to the people who are more business-minded," she says. "I've realized as a co-founder that giving my input, where business is concerned, is something I need to learn how to do better." She also knows that her position makes her something of a role model for other women – and she welcomes the opportunity. "I've always seen myself as confident, and I want other women to feel the same way," says Ellis. "I want them to feel comfortable being themselves." That, after all, is how she feels as a member of Morph, where the positive organizational culture they seek to inspire in others is already well-established. "It is truly a team effort," she says.

Space Hardware Club members **ELENA PRADHAN, MATTHEW HASKELL, SAMANTHA JOHNSON, ERIK KORZON, JARED FUCHS, ADAM BOWER, CHRISTOPHER HELMERICH, and KYLE RENFROE** successfully tested their "Active Luminescence for X-ray Emission Detection" system, which combines lead shielding and scintillation detectors to protect NASA's balloon-born X-ray telescopes from stray X-rays that can spoil their view. The project was funded by a \$50,000 grant from NASA's Undergraduate Student Instrument Project, and the students were advised by UAH engineering professor Dr. Francis Wessling and NASA mentors Dr. Jessica Gaskin and Dr. Wayne Baumgartner of Marshall Space Flight Center and the National Space Science Technology Center. "This is one of the longest projects the club has undertaken, and it's been great to see the team stick together and see all of our hard work come to fruition," says Fuchs. "I personally was involved with this project as a freshman when we first proposed it to NASA, and getting to see our team build and fly this payload is a highlight of my undergraduate experience."



Graduate students **MAGGI KLUG** and **LEAH PARKER** and undergraduates **SARA MILLER, STEPHEN MCNEAL, and ELAINA METCALF** are part of a UAH team supporting NASA's Sally Ride EarthKAM project, which uses a camera attached to the International Space Station

(ISS) to take high-resolution photographs of the Earth. The subjects of the camera's photographs are determined by middle school students around the world, who can request images of particular geographic locations related to their respective curriculum. The team's undergraduate members participate part time between classes, organizing requests for photographs sent in from around the globe. Their graduate counterparts, meanwhile, work full time during mission weeks, sending student requests for photos to the ISS and communicating with staff at the Johnson Space Center to ensure that the EarthKAM camera is aligned and functioning correctly. As Earth system science majors in UAH's Department of Atmospheric Science, the students are overseen by **DR. ROBERT GRIFFIN**, an assistant professor of atmospheric science and a researcher in UAH's Earth System Science Center who serves as the manager of the science and operations portion of the EarthKAM mission. "It's a unique experience for the graduate students as well as the undergraduates, because it takes a little of what they learn in the classroom and puts them in an operations environment," he says. "It also highlights our ability to combine research and education."

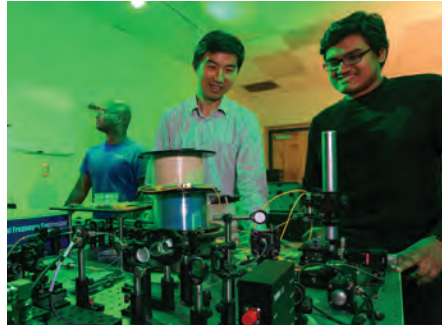


DR. GARY ZANK, chair of the Department of Space Science, presented a paper entitled "Faltering Steps into the Galaxy" at the International Space Science Institute in Bern, Switzerland, and a paper entitled "Particle Acceleration Associated with Magnetic Islands" at the 2018 Asia Oceania Geosciences Society Meeting in Honolulu, HI. He was also named by the National Academy of Sciences as co-chair for the committee performing a decadal survey for plasma physics.

DR. TIMOTHY BOYKIN, professor of electrical and computer engineering, was named a 2018 Fellow of the Institute of Electrical and Electronics Engineers.

The **UAH COLLEGE OF NURSING** was named a National League for Nursing 2018 Center of Excellence in recognition of its efforts to promote the pedagogical expertise of faculty.

DR. WAI YIN MOK, professor of information systems, presented a paper entitled "Extracting Relevant Sentences from Past Court Decisions: An Important First Step of a Legal Deep Learning Research Project" at the 2018 IEEE 3rd International Conference on Big Data Analysis in Shanghai, China.



DR. LINGZE DUAN, an associate professor in the Department of Physics & Astronomy, was promoted to Senior Membership by the Optical Society, the international professional society for optics and photonics.

DR. ERIC SEEMANN, associate professor of psychology, completed the first analysis of inmate data for the Alabama Prisoner Quality of Life Scale, which enables facilities to allocate resources efficiently and demonstrate compliance with federal guidelines and regulations.



DR. LORI LIOCE, a clinical associate professor of nursing, was elected to serve as a member of the International Board of Directors for the Gathering of Healthcare Simulation Technology Specialists (SimGHOSTS).

DR. PAVICA SHELDON, chair of the Department of Communication Arts, presented a paper entitled "Instagram and American Teens: Understanding Motives for its Use and Relationship to Excessive Reassurance-seeking and Interpersonal Rejection" at the annual meeting of the International Communication Association in Prague, Czech Republic.

DR. YEQING BAO, professor of marketing, presented a paper entitled "Religiosity, Spirituality, and Music Preference" at the 2018 International Symposium on Business and Social Sciences in Seoul, Korea; he also served as co-chair of the 2018 China Marketing International Conference in Shanghai, China.



DR. SHANNON L. MATHIS, assistant professor of kinesiology, presented a paper entitled "Factors Associated with Mobility Apprehension in Amputees" at the annual meeting of the American Orthotic and Prosthetic Association National Assembly in Vancouver, British Columbia.

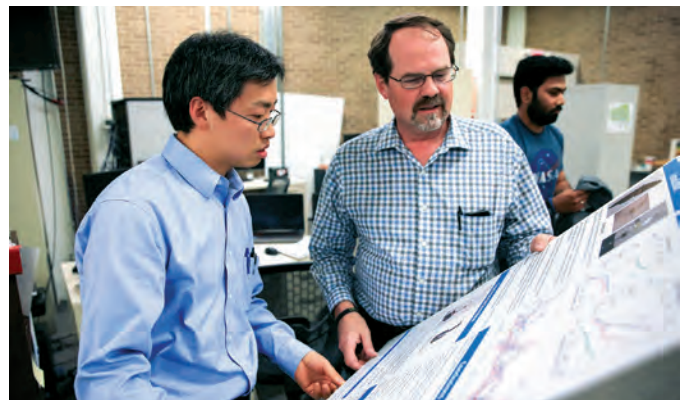
DR. JATINDER (JEET) GUPTA, DR. TOMMY MORRIS, DR. SARA GRAVES, and **DR. SAM YOO** were awarded a grant from the National Science Foundation worth just under \$5M to renew the “Scholarship for Service” project, which awards scholarships to UAH cybersecurity students.



DR. RAVI PATNAYAKUNI, associate professor of information systems, earned the new TS410 certification from SAP, enabling him to offer workshops as an instructor of SAP's new curriculum.

DR. ANDREI GANDILA, assistant professor of history, published his book, “Cultural Encounters on Byzantium's Northern Frontier, c. AD 500–700,” with Cambridge University Press. Drawing on literary, archaeological, anthropological, and numismatic sources, he argues that cultural attraction was a crucial component of the political frontier of exclusion in the northern Balkans.

The Fermi Gamma-ray Burst Monitor team was selected by the High Energy Astrophysics Division of the American Astronomical Society as the 2018 recipient of the Rossi Prize for its role in the first joint detection of gravitational and electromagnetic waves from the same cosmic event: the spectacular smashup of two neutron stars in a distant galaxy. The team comprises **DR. MICHAEL BRIGGS, DR. CHARLES MEEGAN, DR. PETER JENKE, DR. NARANYANA BHAT, DR. PETER VERES,** and **DR. ROBERT PREECE**, as well as graduate students **MATTHEW STANBRO, RACHEL HAMBURG,** and **SURAJ POOLAKKIL**.



DR. CHANG-KWON KANG, an assistant professor of mechanical and aerospace engineering, and graduate student **MADHU SRIDHAR** presented papers entitled “Numerical Investigation of Effects of Experimental Environment on Vortex Formation in Low Reynolds Number Flows” and “Dynamic Relationship between Flapping Wing and Body Undulation of Monarch Butterflies in Free Flight” at the AIAA Aerospace Sciences Meeting in Kissimmee, FL.



UAH'S COLLEGE OF NURSING, in partnership with the Capstone College of Nursing at the University of Alabama, will implement the first online Nursing Science Ph.D. program as well as the first joint Nursing Science Ph.D. program in the state of Alabama this summer. The College also earned full accreditation through 2022 from the Commission on Collegiate Nursing Education for its Doctor of Nursing Practice program.



DR. PAVICA SHELDON, chair of the Department of Communication Arts, is working on a book entitled "The Dark Side of Social Media Communications," which will examine how social media impacts our lives. "One of the chapters focuses on social media's impact on mental and physical health," she says. "People who do not have friends whom they can talk to face to face not only feel lonely, but they also lack social support – and lack of social support can cause early death." She is quick to point out that social media is not solely to blame, however; rather, she cites "the overall culture we live in – spending less time with family and friends and more time with our technological devices." Instead Dr. Sheldon suggests a variety of approaches to increase social interaction for every generation, from participating in extracurricular activities after school and working out with friends to joining a group of peers with similar interests and taking continuing education classes. "Most employers also offer some kind of counseling services," she says, "and sources for affordable or free counseling include non-profits and religious organizations such as St. Vincent de Paul, the American Red Cross, and the Downtown Rescue Mission."



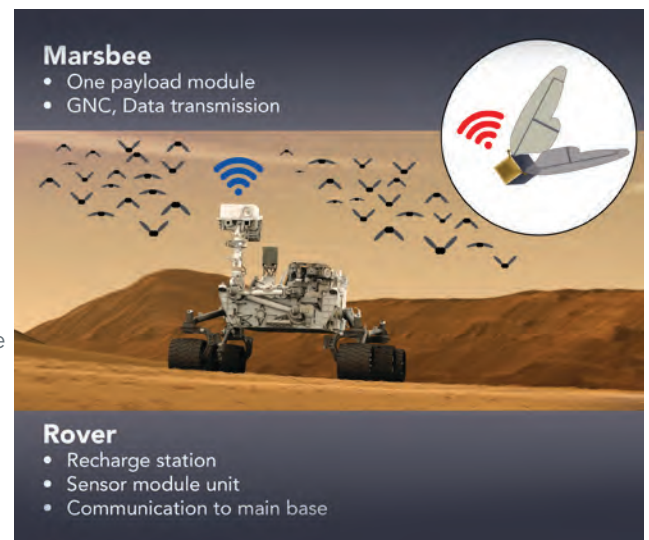
UAH's CENTER FOR CYBERSECURITY RESEARCH AND EDUCATION (CCRE)

received a grant from the National Security Agency to fund the Expanding Cybersecurity Innovative Incubator to Extended Demographics (ExCIITED) program, an initiative designed to introduce

high school students in rural Alabama to the field of cybersecurity. During its first year, ExCIITED enrolled 20 students, with 16 going on to successfully complete an "Engineering 101" class familiarizing them with the fundamental principles of programming. Ten were then selected to spend several weeks as summer interns with the CCRE's Cyber Force Incubator, where they worked on a collection of contract and grant-funded projects. Four now attend UAH as undergraduates. "I am very pleased with the success of the program and students," says Sharon Johnson, deputy director of the CCRE and coordinator of the ExCIITED program. "They have performed beautifully."

DR. CHANG-KWON KANG, an assistant professor of mechanical and aerospace engineering, was one of only 25 applicants selected to receive a 2018 NASA Innovative Advanced Concepts award for his collaborative project on Marsbees. His collaborators include **DR. FARBOD FAHIMI**, **DR. BRIAN LANDRUM**, and **DR. GUANGSHENG ZHANG** from UAH's

Department of Mechanical & Aerospace Engineering; **DR. BRYAN MESMER** from UAH's Department of Industrial & Systems Engineering and Engineering Management; **DR. ROBERT GRIFFIN** from UAH's Department of Atmospheric Science; Dr. Taeyoung Lee from George Washington University's School of Engineering & Applied Science; and Dr. Aono Hikaru from the Tokyo University of Science. "Flying on Mars is challenging because of the ultra-low density in the Martian atmosphere, so one of our main goals for the first phase is to experimentally demonstrate that these Marsbees can lift off their own weight in Martian density conditions," says Dr. Kang, who will be conducting testing in the vacuum chamber of UAH's **PROPULSION RESEARCH CENTER**. "Our long-term goal is to develop swarms of Marsbees that can help with human exploration on Mars."



DR. AMY HUNTER, DR. KAREN FRITH, and **DR. SHARON COFFEY**, professors in UAH's College of Nursing, received a grant from the Sigma Theta Tau International Honor Society of Nursing to fund "Stay Standing," a study comparing the outcomes of a group of older adults living within the general community to another receiving care at a gerontology practice. Both groups took part in regular testing to determine their mobility, their awareness of medications, and their commitment to an exercise regimen. Two professors and a Ph.D. student from UAH's Department of Electrical and Computer Engineering – **DR. EMIL JOVANOVIĆ, DR. ALEKSANDAR MILENKOVIC,** and **PRIYANKA MADHUSHRI** – also helped with the study, developing a smartphone application to collect and catalog data. Thanks to these efforts, the researchers were able to conclude that older patients who had participated showed improved strength and balance tests as compared with those who were seen at their primary care provider's office, and that patients who were educated about potentially inappropriate medicines scored higher on later medication tests, demonstrating that they had learned which medications to avoid. "The benefits found in this study could be easily replicated using the procedures we implemented," says Dr. Hunter.



DR. SURANGI JAYAWARDENA, an assistant professor of chemistry, has been able to successfully further her research designing point-of-care rapid diagnostic kits for pathogenic bacteria and exploring anti-infective nanotherapeutics to treat nosocomial infections. She has already developed a low-cost diagnostic method to detect *Mycobacteria* sp. in sputum and obtained a provisional patent for the test. Now she is doing the same for *Chlamydia trachomatis*, this time partnering with **DR. LEONARD PETNGA**, an assistant professor in UAH's Department of Industrial & Systems Engineering and Engineering Management, to develop a mathematical model that will help eliminate the time-consuming lab work required to determine the stability of a vaccine antigen in different formulations. "There is only a small scientific community working on nanomaterials and interfacing with microorganisms, like bacteria/viruses," says Dr. Jayawardena. "So I'm really glad to be here at UAH, because I bring a different angle to research, one that is geared toward medical application."



UAH's **PROPULSION RESEARCH CENTER (PRC)** successfully demonstrated an upgrade to the cryogenic flow capability of its Rocket Test Facility last spring. The demonstration test ran over 20 seconds using a 1,500 pounds per square inch pressurization system that exceeded the test runtime objective by 100 percent. The upgrade was conducted in partnership with the U.S. Department of Defense's Missile Defense Agency and incorporated high-pressure tanks acquired from Arnold Engineering Development

Center, new flow system components, and a new digital data acquisition/control system. "This increased capability will enlarge future research opportunities on hybrid and liquid rocket engine research and technology development at the PRC," says **DR. ROBERT A. FREDERICK JR.**, center director and a professor in UAH's Department of Mechanical and Aerospace Engineering. "The UAH team did an outstanding job of designing, assembling, and successfully demonstrating the operation of the unique system." Team members included **DR. DAVID LINEBERRY, TONY HALL, VIVIAN BRASWELL, DAN JONES, JOSEPH AGNEW,** the late **CLAIRE STASCHUS**, UAH student **EVAN UNRUH**, and UAH alumnus **BEN BEEKER**, among others.





CONGRATULATIONS | 2018 ALUMNI OF ACHIEVEMENT AWARD WINNERS

The Alumni of Achievement Award was created in 2001 as part of the university's 50 years of class celebration and 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. Winners are selected by a committee from nominations made by alumni, faculty, and friends.

ASHLEY KEEBLE, *Pacific Architects and Engineering, Deputy Project Manager, AFRICAP and Africa Programs ('03, BS, Finance)*

Specializing in expeditionary construction, logistics, training, operations, and maintenance, Pacific Architects and Engineering (PAE) provides services on all continents and has programs in 22 African countries. As deputy program manager, Ashley Keeble is responsible for managing and assisting the Africa Peacekeeping Program and Africa Programs, which generate revenues of \$100 million annually.

"My degree from UAH has been critical to my success," says Keeble, who recalls professor Dr. Dorla Evans as a particular source of inspiration.

"When I finished Professor Evans' class, that's when I knew I wanted to pursue a career in corporate finance. That moment really forged the path to where I am today. There is not a day that I do not use my finance degree in my current career. I run operations in Africa but you always have a budget to adhere to, or profit and loss targets to hit."

Keeble began her career as a budget analyst with Jacobs Sverdrup at Marshall Space Flight Center. Before joining PAE, she was employed as a senior pricing policy analyst at Lockheed Martin Corporation in Rosslyn, VA, and as business ops staff III at United Space Alliance at the Kennedy Space Center in Cape Canaveral, FL.

In addition to her bachelor's degree from UAH, she also holds an MBA from the Florida Institute of Technology.

JOHN BRAUN, *President and Founder, Dynamis Inc. ('91, BA, Political Science)*

Huntsville native John Braun is the president and founder of Dynamis Inc., a professional services business serving customers in the homeland security, defense, and aerospace communities. Named after the ancient Greek word "dynamis," meaning heart, drive, and spirit, the company has more than 150 full-time employees and over \$26 million in annual sales.

A political science major at UAH, Braun pursued a career in policy and politics beginning as an arms control

specialist with Teledyne Brown Engineering Inc. He also served at the Pentagon as a congressional analyst for the Assistant Secretary of the Air Force and as a senior policy analyst in the National Security Negotiations Division of Air Force Headquarters. Before starting Dynamis Inc., Braun served as a legislative assistant for Alabama Congressman Bud Cramer and spent 11 years with Teledyne Technologies Inc. as the vice president of Washington Operations.

"UAH was certainly influential in my career path, as I found my first job as a contractor with the Office of the U.S. Army Treaty Advisor through a connection in the Department of Political Science," he says.

In addition to his Bachelor of Arts from UAH, Braun also holds a Juris Doctorate in international law from the Catholic University School of Law and a certificate in international politics and economics from Georgetown University.

CASSANDRA WARNER FRIESON,
President and Founder, Fall Injury Prevention and Rehabilitation Services LLC ('11, DNP, Nursing)

Before opening the Fall Injury Prevention and Rehabilitation Center, Cassandra Warner Frieson learned many of the skills she would need to care for her geriatric patients at UAH's College of Nursing, where she earned her Doctor of Nursing Practice.

"The College's academically rigorous program of study served as a great foundation for my future as an entrepreneur and the establishment of my own center," she says. "I put my scholarly project into real-life clinical practice in the establishment of a community-based fall-prevention clinic for older persons."

The center, located in Birmingham, AL, focuses on the prevention and management of chronic health conditions such as arthritis, diabetes, and heart disease and the prevention of injuries due to a fall.

Frieson is a member of the UAH College of Nursing Advisory Board. She also serves as editor-in-chief and editor for "The Journal of Perioperative & Critical Intensive Care Nursing, Gerontology & Geriatrics Research" and is a guest associate editor for "Frontiers in Public Health."

Before opening her clinic in 2014, Frieson was employed as a family nurse practitioner in Cullman, AL, and as an adjunct faculty member in the UAH Graduate Nursing Program. She also worked as a nurse practitioner in pediatric infectious disease in a Wetumpka, AL, pediatric clinic.

BRAJ K. SINGH, *Deputy Director (Retired), U.S. Department of Energy ('71, MS, Mechanical Engineering)*

Before his recent retirement, Braj K. Singh spent three decades working for

the U.S. Department of Energy (DOE), including in its Office of Environmental Management; its Office of Environment, Safety and Health; and its Office of Nuclear Energy. His responsibilities included supervising, managing, and directing a multidisciplinary line organization responsible for developing directives for DOE-owned facilities in the areas of decommissioning, safety analysis, human factors, fire protection, packaging and transportation, criticality safety, and risk-based regulation.

Singh completed his Bachelor of Science in mechanical engineering from BIT Sindri in India. He then attended UAH upon the recommendation of Dr. Upendra Roy, then an assistant engineering professor at the university. After earning his master's degree in mechanical engineering, Singh worked as a project manager for the U.S. Nuclear Regulatory Commission before joining the DOE.

Singh, who has published several technical papers and co-authored a book on engineering thermodynamics for undergraduate engineering students in India, credits his diverse academic background with career success. "With a major in aerospace engineering and a minor in operations research, and additional graduate studies in fluid and thermal engineering," he says, "UAH prepared me for challenging jobs in my career in the private sector and with the federal government."

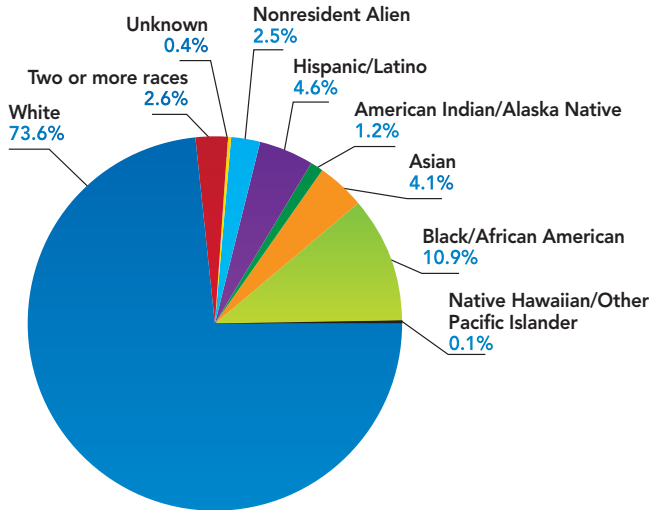
Following the retirement of Robert Lyon, **MALLIE HALE** was appointed to serve as interim vice president of UAH's Office of University Advancement. Hale joined UAH two years ago as senior director of Alumni Relations, after serving as a major gifts officer for three years in the School of Medicine's Department of Medicine at The University of Alabama at Birmingham (UAB).

Since arriving at UAH, Hale has worked to establish new alumni chapters, partnered with UAH's Office of Career Services to launch a new mentoring program that aligns student interests with alumni expertise, enhanced Alumni Relations' online and social media presence, and recruited Alumni Ambassadors to aid in student recruitment efforts. Hale received a BS in psychology from Birmingham-Southern College and an MA in applied sociology from UAB.



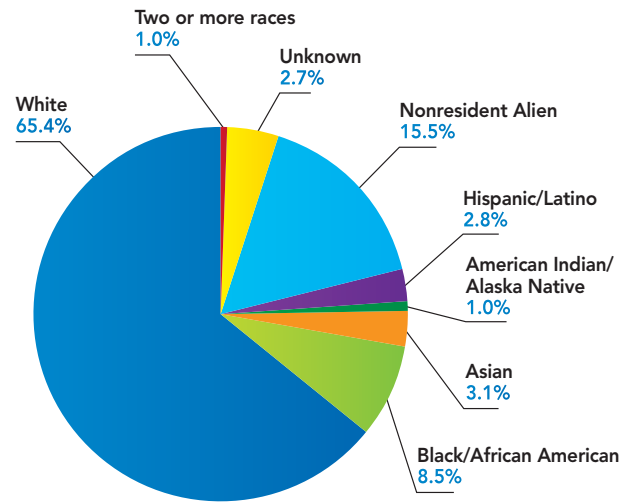
Undergraduate Student Composition

FY18 (Fall 2017)



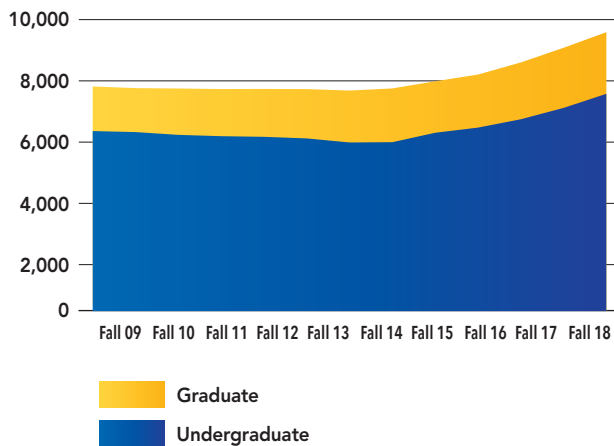
Graduate Student Composition

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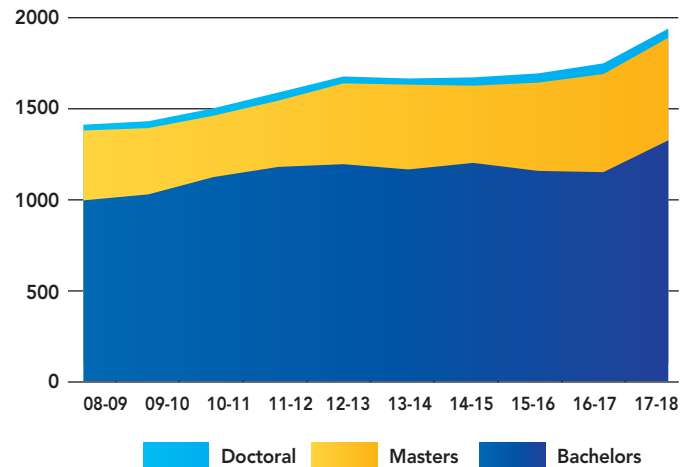
Enrollment

Fall 09 to Fall 18



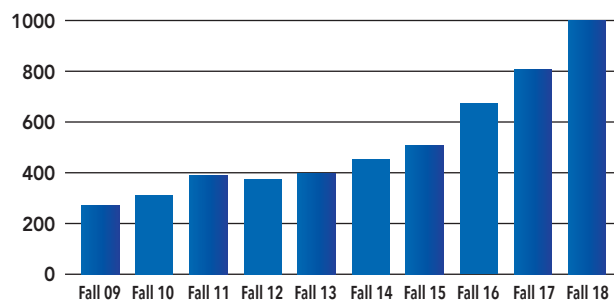
Undergraduate & Graduate Degrees

AY 07-08 to AY 17-18



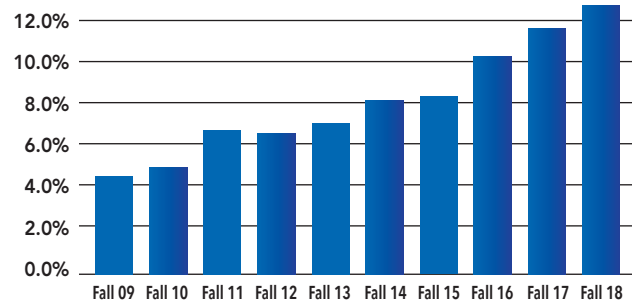
Undergraduate Honors Enrollment

Fall 09 to Fall 18

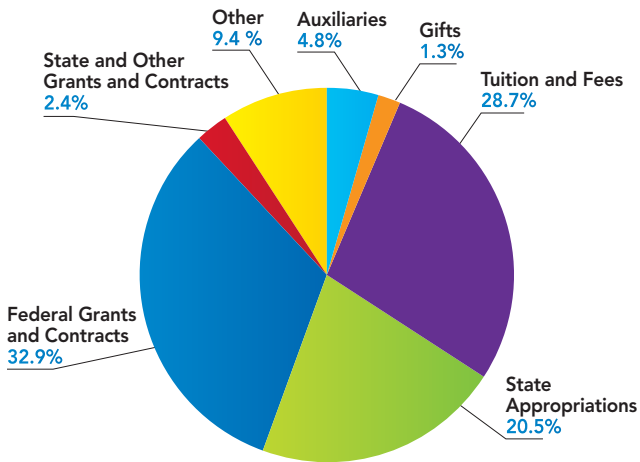


Honors as % of Undergraduate Enrollment

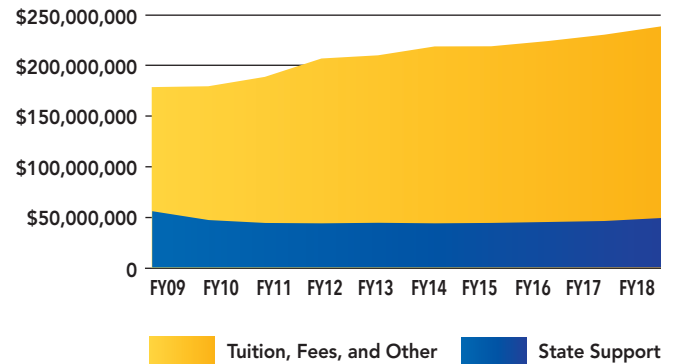
Fall 09 to Fall 18



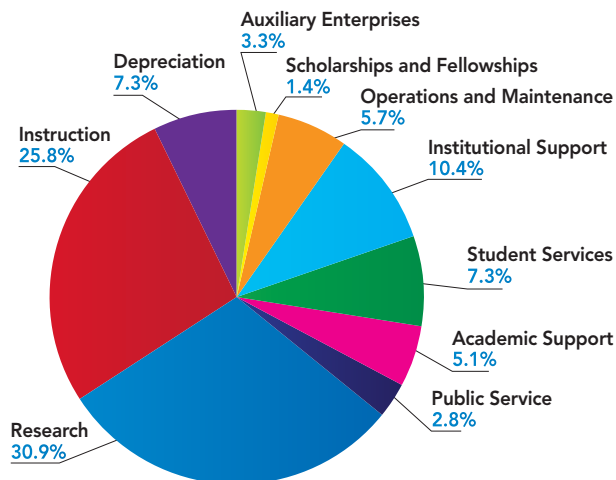
FY18 Revenue \$235,395,096



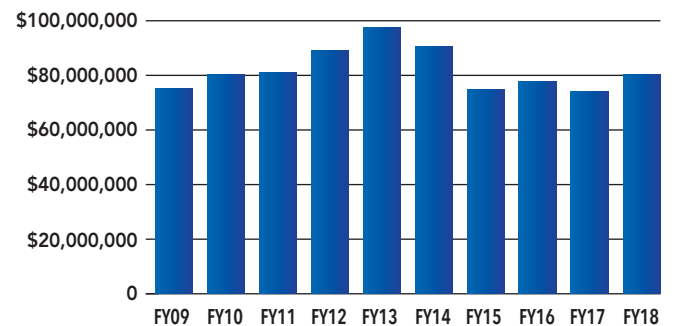
Operating Revenue FY09 to FY18



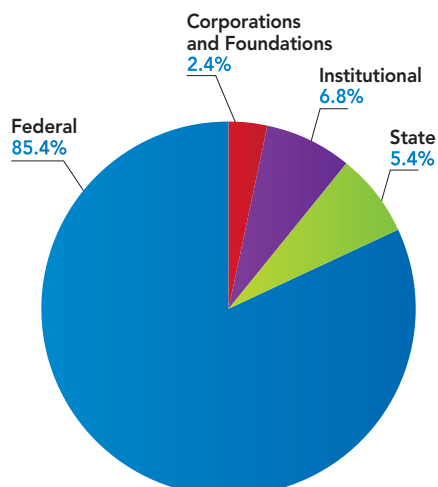
FY18 Expenditures \$235,395,096



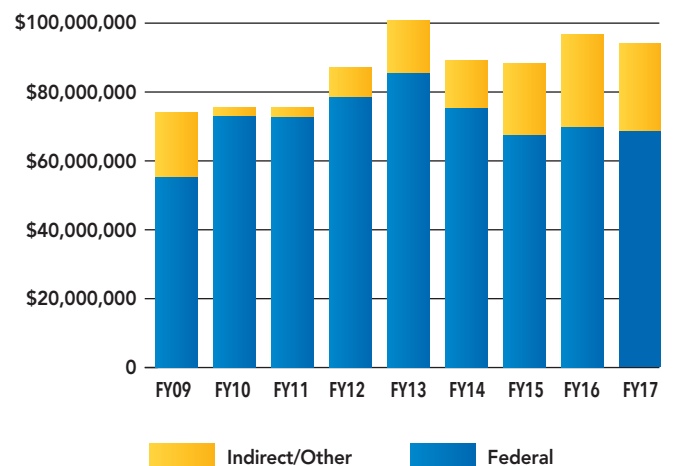
Grant and Contract Expenditures (Research, Instruction, and Public Service)



FY18 Direct Research Expenditures by Source \$72,734,153



Total R&D Expenditures as Reported to NSF* (www.nsf.gov/statistics/)



*FY18 not yet reported to NSF




2018 UAH ATHLETICS DEPARTMENT MILESTONES

During 2018, the UAH Athletics Department made great strides in program operation, academic, and facility improvements. Thanks entirely to private gifts, we were able to unveil the **LENNIE ACUFF** Men's Basketball Suite, the **DOUG ROSS** Hockey Suite, and the **DAVID W. CAIN** Head Coach's Office. The UAH Athletic Weight Room was also completely renovated and all new equipment was purchased entirely with private funds from two prominent former hockey players. In the summer, both the women's lacrosse dressing room and the men's soccer locker room were renovated with private contributions. And the lower level of Spragins Gym received a brand-new floor and lower-level bleachers.


Our graduation rates continued to rise, and our overall grade point average remains the highest of any student group on campus. More than 220 student-athletes were named to the Gulf South Conference (GSC), the Great Lakes Valley Conference (GLVC), and the Western Collegiate Hockey Association (WCHA) Academic Honor Rolls, and 64 student-athletes who achieved a 4.0 grade point average were honored at the Department's annual "4.0 Night."


The Department also set the school record for revenues once again, with more than \$1.2 million dollars generated in 2018. It is unheard of for non-football schools in the GSC to eclipse the million-dollar mark, yet the Department has done it three times in the past seven years. In an effort to improve our fan base, our Sports Information Office also expanded its reach through social media, attaining more than 7,000 followers on Twitter.

2018 ATHLETIC ACCOMPLISHMENTS

 **MEN'S BASKETBALL** had the 14th highest attendance average among Division II schools, and the lower-level of Spragins Gym was sold out in fall 2018 for the eighth year in a row.


 **WOMEN'S CROSS COUNTRY** team finished as the GSC Runner-Up.

 **HOCKEY** had its best win total yet in the WCHA, also winning a contest in the conference playoffs.


 **WOMEN'S LACROSSE** finished as the GSC Runner-Up, and was the NCAA leader in goals scored for the third straight season.

 **MEN'S TRACK & FIELD** won the GSC Championship in 2018 and also had student-athletes participate

in the NCAA National Meet in Charlotte, NC. **DAVID CAIN** was named GSC Men's Track Coach of the Year and South Region Coach of the Year.

 **MEN'S SOCCER** finished the season with 10 wins, losing in the GSC Tournament on penalty kicks after two overtimes.

 **SOFTBALL** earned its 16th straight NCAA tournament berth, won the NCAA South Regional, and advanced to the NCAA South Super Regional – one win from the World Series.

 **VOLLEYBALL** tied their highest win total in more than a decade with 23 victories.

THE UAH ATHLETICS DEPARTMENT PURSUES ACADEMIC SUCCESS AND EMPHASIZES THE MOLDING OF THE TOTAL STUDENT-ATHLETE. UAH ADMINISTRATORS AND COACHES PROVIDE A POSITIVE ENVIRONMENT FOR STUDENT-ATHLETES THAT PROMOTES PHYSICAL, EMOTIONAL, AND SOCIAL WELFARE, SAFETY, SPORTSMANSHIP, ETHNIC DIVERSITY, AND GENDER EQUITY. THE DEPARTMENT RECRUITS YOUNG PEOPLE WHO ARE QUALITY PEOPLE, QUALITY STUDENTS, AND QUALITY ATHLETES. UAH IS COMMITTED TO ABIDING BY NCAA, GSC, GLVC, AND WCHA RULES AND REGULATIONS, AND STRIVES TO ABIDE BY THEM AT ALL TIMES.



Peace ON EARTH

UAH's sixth annual "Peace on Earth" holiday spectacular was presented by the College of Arts, Humanities, & Social Sciences on Friday, Nov. 30, in the Von Braun Center Concert Hall. It featured performances by faculty and students of the UAH Department of Music, the Huntsville Symphony Orchestra, the Huntsville Community Chorus, and special guest Wynonna.





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