

Summer 2016

## UAH Magazine, Summer 2016

University of Alabama in Huntsville

Follow this and additional works at: <https://louis.uah.edu/uah-magazine>

---

### Recommended Citation

University of Alabama in Huntsville, "UAH Magazine, Summer 2016" (2016). *UAH Magazine*. 19.  
<https://louis.uah.edu/uah-magazine/19>

This Report is brought to you for free and open access by the Alumni Publications at LOUIS. It has been accepted for inclusion in UAH Magazine by an authorized administrator of LOUIS.



THE UNIVERSITY OF  
ALABAMA IN HUNTSVILLE

SUMMER ISSUE 2016

# COLLABORATIVE LEARNING

New center will further  
UAH's educational aims

$$f(x,y,z) = xy - yz$$

$$f_z(x,y,z) = 0 - 2yz + h'(t)$$

an

## INSIDE:

### ACADEMICS

Outreach project  
provides answers



### RESEARCH

Ozone measured  
by Lidar facility



### ALUMNI

Love of music  
leads to success



HIGHLIGHTS: BUSINESS INCUBATOR, BUD CRAMER'S LEGACY, AND COMMENCEMENT



## WE HOPE TO SEE YOU ON CAMPUS SOON!

[uah.edu/admissions/events](http://uah.edu/admissions/events)

### CHARGER PREVIEW

High school sophomores, juniors, and their families are invited to visit our beautiful campus to gain a quick overview of UAH.

▶ Saturday, July 9

### DISCOVERY DAY

High school seniors, transfer students, and their families are invited to visit UAH for a more in-depth look at the Charger experience.

▶ Saturday, October 29

▶ Saturday, November 19

### CAMPUS VISITS

Schedule your own visit to campus at [uah.edu/visit](http://uah.edu/visit).



THE UNIVERSITY OF  
ALABAMA IN HUNTSVILLE

# Features



2

## Up Front

Under the leadership of Dr. Dan Rochowiak, UAH's Collaborative Learning Center seeks to further the university's educational aims and enhance its academic culture.



## 4 ACADEMICS

Assistant professor of art Katie Baldwin shares her passion for traditional letterpress printing with a new generation of students.



8

## RESEARCH

An influx of grants and donations helps bring the I<sup>2</sup>C – UAH's proposed, 45,000-square-foot Innovation to Innovation Center – closer to reality.



12

## CAMPUS

Materials related to Congressman Bud Cramer's 18 years of public service will be organized, cataloged, maintained, and preserved by UAH's M. Louis Salmon Library.



16

## ALUMNI

After growing up in foster care, alumna Sacred Huff finds her perseverance rewarded with a generous scholarship to study constitutional and civil rights law.

7

## COMPASSIONATE CARE

*Education professor's career focuses on those with autism.*

9

## MAKING WAVES

*Detection of gravitational waves marks scientific sea change.*

14

## GROWTH SPURT

*Construction is complete on the new College of Nursing Building.*

17

## PITCH PERFECT

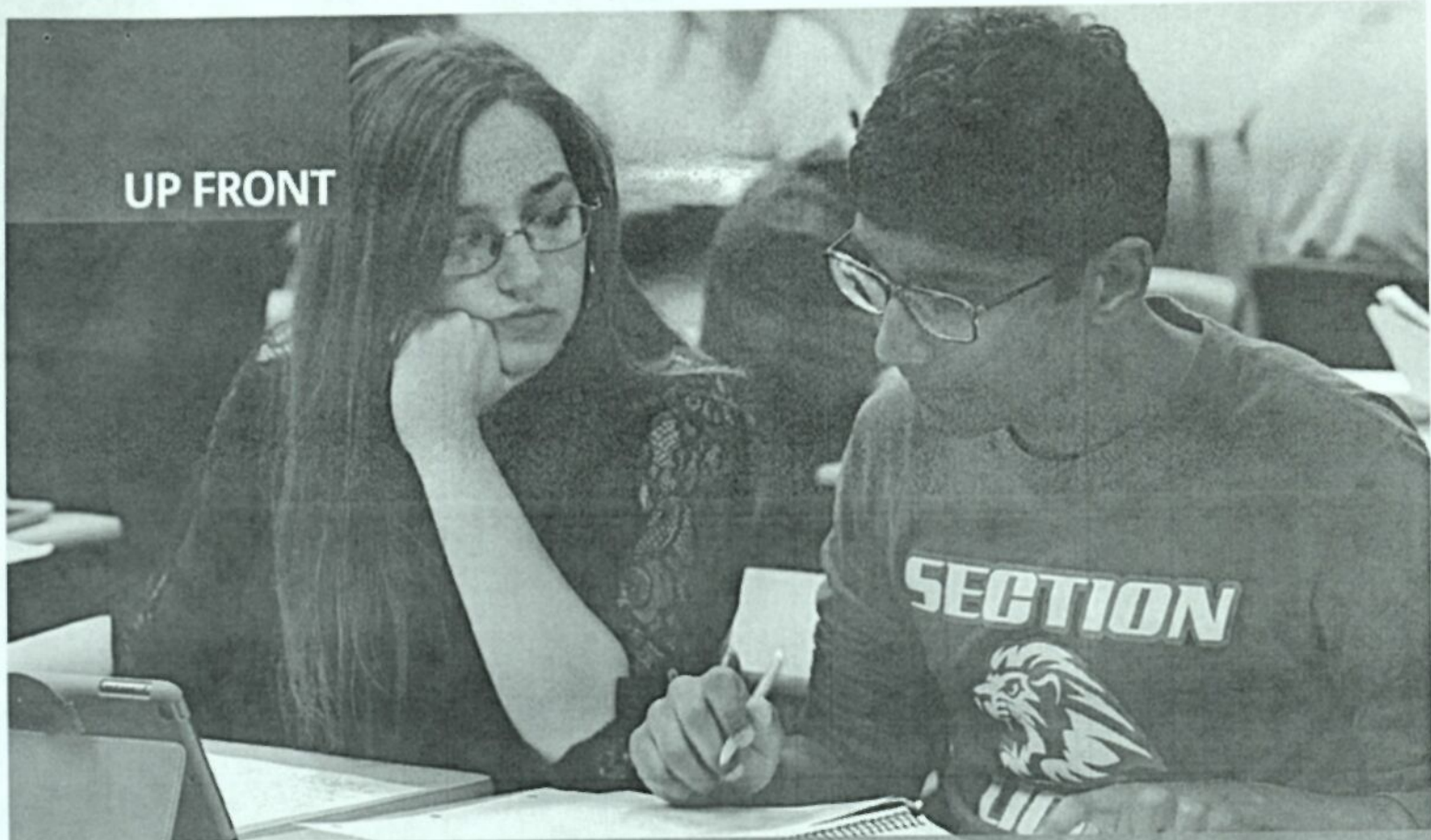
*Love of music helps land alumnus his dream job.*

19

## HIGHLIGHTS

*A recap of our popular social media posts and an update from the Athletics Department.*

UP FRONT



# MAKING CONNECTIONS

With increased recruitment efforts by The University of Alabama in Huntsville (UAH) resulting in record enrollment over the past year, the focus is now on making sure that the university's growth is sustainable. Key to that is ensuring that all students – whether first-time freshmen, transfers, on-campus residents, or off-campus commuters – feel connected to UAH.

"Through surveys, focus groups, and collaborative problem-solving sessions, we've learned that students who have difficulty succeeding academically often feel isolated and disconnected from their peers," says Dr. Al Wilhite, chair of the committee appointed to improve student success and retention at UAH. "We also discovered that those who overcame the challenges they faced did so because of the connections they made with other students."

Most of those connections were made in the classroom, and in particular in classes that encouraged or required students to work together and interact. "Classes present the best opportunity the institution has to reach all of its students," says Dr. Wilhite. "While there are other venues on campus accessed by many students, the classroom is the only place shared by transfer students, first-time freshmen, and those at both the beginning and the end of their academic careers."

Enter the Collaborative Learning Center (CLC), a brand-new initiative that seeks to combine classroom-based activity with enhanced learning techniques and bring students together in an academic activity. "Its mission is to develop best practices in a collaborative learning environment and make them part of every student's experience to improve how we teach and how students learn," says Dr. Christine Curtis,

"Classes present the best opportunity the institution has to reach all of its students."

Students in Professor Bowman's calculus class enjoy higher success rates thanks to her inclusion of collaborative learning techniques.

Provost and Executive Vice President for Academic Affairs. This will be done in accordance with the fundamental principles underlying collaborative learning:

- ▶ **Egalitarian.** Everyone in the collaboration is expected to contribute, which emphasizes the value of different knowledge, perspectives, and skill sets.
- ▶ **Discursive.** The involvement of all the collaborators necessitates their interaction, which opens them to new ideas and requires communication.
- ▶ **Inquiry driven.** Collaborative learning encourages students to ask questions and to consider a variety of approaches to problems.
- ▶ **Intentional.** Instructional activities and assignments actively engage students in working together toward specific, stated learning objectives.

"Through the connections that collaborative learning fosters, students will become more fully integrated into the fabric of the university, and both faculty and students will become essential partners in the teaching and learning environment," says Dr. Curtis. "In classrooms, labs, and studios, students with varied backgrounds, experience, and knowledge will come together to work and study. They will learn to think critically about their course material and to solve problems collaboratively – hopefully resulting in strengthened relationships with each other and with UAH."

Responsibility for executing the Center's mission will fall to its director, associate professor of computer science Dr. Dan Rochowiak, and its Collaborative Learning Advisory Committee, chaired by professor of English Dr. Laurel Bollinger. Their focus will be on recruiting faculty members to incorporate collaborative learning practices into their classes and overseeing the dissemination of collaborative learning information and materials.

"We plan to establish a collaborative learning grant program that will not only provide financial resources to recipients but also guidance on how best to implement their particular collaborative learning efforts," says Dr. Rochowiak, who previously served as the associate dean of the College of Science and the director of the Intelligent Systems Laboratory. "And we will create two awards – a teaching award and a project award – to encourage high-quality collaborative enterprises."

Support for the CLC and its goal of incorporating collaborative learning in the classroom is already

widespread. "Even at this early stage, this initiative has begun to generate excitement among faculty interested in learning the best practices of this exciting approach to teaching," says Dr. Curtis. Some, in fact, have already introduced collaborative learning techniques in their classrooms. Take for example Dr. Elizabeth Bowman, a lecturer in the Mathematical Sciences Department.

Last summer, Dr. Bowman worked closely with Student Success Center director Alan Constant to create a collaborative learning environment in her calculus class. The result? Her students enjoyed a success rate of 80 percent compared to the typical success rate of 62 percent to 67 percent. "She is truly a collaborative learning pioneer," says Dr. Rochowiak. "Rather than lecturing her students, she now gives them an overview of the techniques they need to learn and then sorts them into groups to work through problems together. She also walks about the class watching, coaching, and helping."

As more faculty adopt practices like these – and more students benefit from the connections that they engender – there's a good chance that collaborative learning "may become a distinguishing feature of the UAH educational experience," says Dr. Curtis. "Success will depend upon a continuous analysis of the data to distinguish what works well from what needs improvement. But from what we've seen so far, the approach fits well with our university's culture and needs and will continue to grow as enrollment grows."



A recent collaboration between the College of Nursing and the Theatre Program added a real-world component to end-of-life training simulations.

# An Artistic Approach

Art professor Katie Baldwin shares her passion for letterpress with a new generation of artists

**K**atie Baldwin's reputation as a printmaker and book artist is well known across campus and in the local arts community at large. So it's no surprise that the assistant professor of art was hand-picked to serve as a juror for "Anthology: Visual Narratives from Nashville's Print Community," a recent exhibition in the Conte Community Arts Gallery at the Frist Center for the Visual Arts.

One of Baldwin's own passions is letterpress printing. She was first introduced to it in the early 1990s and then studied it formally while pursuing her master of fine arts in book arts and printmaking in the early 2000s. "I saw this real resurgence where the letterpress was being used to print but the plates were being designed on the computer," she says. "It kind

---

"All of the terminology used in graphic design comes from the letterpress."

---



After UAH's letterpress was brought back from obscurity, Baldwin was able to introduce a letterpress workshop to her book arts class.

of became financially viable again to have the aesthetic of the impression you get from the press but the flexibility of designing something on the computer."

She became even more familiar with the technique after interning at the Bixler Press & Letterfoundry in upstate New York, where she cast type. A series of fellowships, including one as the Victor Hammer Fellow in the Book Arts, led Baldwin to UAH, where she joined the faculty of the Department of Art, Art History, and Design.

Her arrival coincided serendipitously with the Department's efforts to bring UAH's own Chandler & Price Press, since renamed the Rocket Press, out of obscurity. "It had been moved into a shop and was being used less and less, so the faculty

decided to bring it back to Wilson Hall," she says. That enabled her to add a letterpress workshop to her book arts class, something she says has met with positive reviews. "Most students find it really interesting, especially because it's tangible but also very connected to the computer – all of the terminology used in graphic design comes from the letterpress."

Each workshop culminates in a real-world capstone project; this past semester, it was "Real Time, Real Place," a collaborative artist book that was printed and bound by seven of her students. "They showed it during the Member's Portfolio Review at the College Book Arts Association Conference in Nashville," she says. Baldwin also invited visiting artist Jessica Peterson of the Southern

Letterpress in New Orleans to share her knowledge of the technique. "Jessica worked with students to print a French-fold one-page book about Huntsville's famous cow, Lily Flagg."

She knows, of course, that inspiring a handful of students at a time is probably not the fastest way to introduce a whole new generation to the joys of letterpress printing. But Baldwin is playing the long game, something else she's learned from her experience with the art form. "All of this works exactly as it worked 100-plus years ago," she says. And come another 100 years, it will still be around. After all, she points out with a laugh, "you don't need electricity to run the press. If everything falls apart in Huntsville, we could still come up here and print!"

# The Head & the Heart

## ENGINEERING STUDENTS BRING HEART TO AN OUTREACH PROJECT ON THE BRAIN

After watching her brother struggle with dyslexia throughout his academic career, Kacey Tyra knows the challenges faced by those who are affected by a learning disability. So when the senior mechanical engineering major was asked to select a project for her Engineering Design – Product Realization course, the choice was easy: a 3-D model of a brain that would serve as an outreach tool for visitors to Greengate, a local private school for children with dyslexia. “I thought about my brother and how, if he could have had a tool like this and the teachers knew more about dyslexia, his journey through school would have been more successful,” Tyra says.

Step one was narrowing down the requirements for the product. Because Greengate relies on the Orton-Gillingham (O-G) method of teaching children with dyslexia, the school’s primary focus was on comparing the brain’s behavior before and after O-G instruction. “We communicated with Greengate’s staff and parents and did market research that would help us home in on what we could come up with that was what they wanted,” says Matthew Calahan, a senior mechanical engineering major who was part of the team. “And we used the NASA Systems Engineering Handbook to go through the design process.”

Several iterations later and the team – dubbed “the Brainiacs” – had what they felt was a workable plan for a final product that would meet Greengate’s needs:

the Dyslexic Brain Display. And once that received approval from Greengate, product sponsor Women in Defense, and course lecturer Dr. Christina Carmen, they were ready to begin building the display.

But having a workable plan and actually executing that plan proved more challenging than they expected. “Once you figure out one thing, you find two more things you don’t know how to do,” says Tyra with a laugh. By the end of the process, however, they couldn’t have been more pleased with the result. “It came together 100 percent,” says Calahan. “And our sponsor was blown

away – she had no idea we’d knock it out of the park.”

The reception was equally positive when the Brainiacs assembled one last time to present the Dyslexic Brain Display to Greengate’s staff and parents. “I think more than any other praise we got, what I took away was the comments from the parents,” says Calahan. “So many said they found out about their child’s dyslexia so late, and that if only they’d had something like this they wouldn’t have wasted so much time trying to determine what the issue was.”

That was certainly true for Tyra’s brother, but now she can take comfort in knowing that her contributions may one day ensure that others don’t face the same struggles he did. “My brother is an adult now and has learned to deal with his dyslexia,” she says, “but this will help other students with the disability develop into more successful members of society.”



▲ The Dyslexic Brain Display, built and designed by a team of engineering students from UAH, is designed to show a dyslexic brain’s behavior before and after Orton-Gillingham instruction.



# Former Patient, Future Charger

For the last seven years, Cassie Barnby has come to UAH to give a presentation on tyrosinemia to students in the College of Nursing. And this past fall, she conducted and presented groundbreaking research conducted with UAH biology professor Dr. Gordon MacGregor at the first-ever International Tyrosinemia Conference in Quebec. Yet Barnby is neither a healthcare professional nor an academic researcher. Rather, she is an 18-year-old high school senior living with tyrosinemia type I. "My brother and I both have the disorder, and we both received liver transplants as a result," she says. "My childhood was spent in a hospital."

It was Cassie's mother, Dr. Elizabeth Barnby, who originally brought tyrosinemia to Dr. MacGregor's attention. At the

"I'm curious to know more and to see if we can't find an improved treatment or a cure for tyrosinemia altogether,"

Barnby says. "It would be great if other children didn't need a liver transplant like my brother and me."



Future Charger Cassie Barnby assisted UAH biology professor Dr. Gordon MacGregor with research on tyrosinemia type I, which she then presented at the 2015 Tyrosinemia International Conference.

time, she was a student in his graduate physiology class; she's since become a clinical assistant professor in UAH's College of Nursing. "She kept asking me to do this research," he says, laughing. "To be honest, she was a bit of a pain about it!" But it ended up being a perfect fit with the gastrointestinal and kidney research he was already doing, and even more appealing to him, it was a niche area.

He soon learned from the existing research that kids whose tyrosinemia is treated with the drug NTBC tend to have a higher percentage of cognitive and behavioral problems, something that hadn't been apparent before the drug had extended the lifespan of those with the disorder. The question was, why? "We're only just seeing the long-term consequences of living with tyrosinemia," says Dr. MacGregor, "but we don't know whether those issues are being caused by the disorder or the treatment."

To find out, he devised two simple tests that would investigate the effects of NTBC and tyrosinemia type I on mouse social interactions and behavior. He also enlisted the help of Cassie Barnby, whom he not only knew from past interactions with her mother but who was already planning to go to the tyrosinemia conference as an attendee. Barnby was tasked

with helping to run the social preference test and, along with UAH Honors student Ashton Koenig, analyzing the data. They ultimately learned that the mice with tyrosinemia type I showed disorder-specific behavioral differences in social interaction tests independent of any effects of NTBC.

With the experiment complete, Dr. MacGregor and Barnby headed to Quebec to present their research before the more than 200 doctors, scientists, patients, and families. "I was terrified I'd mess up," says Barnby. Instead, she ended up winning first place in the basic science research category – and possibly a much broader audience for her work. "I hope people took away a curiosity about this pediatric disorder and an awareness of how they can help children with tyrosinemia," she says.

Now Barnby plans to build on that award-winning research this fall, as a full-time freshman in UAH's College of Nursing – a place she refers to as her "second home" after so many years spent speaking to nursing students about tyrosinemia. "I'm curious to know more and to see if we can't find an improved treatment or a cure for tyrosinemia altogether," she says. "It would be great if other children didn't need a liver transplant like my brother and me."

# COMPASSIONATE CARE

Dr. Whitney Meade's passion for helping others was sparked by a high school field trip to the King's Daughters' School, a residential facility for individuals with developmental disabilities. "I was fascinated," says the assistant professor in UAH's College of Education. She ended up talking the facility's director into creating a special position for her, working there part-time on the weekends before eventually becoming a live-in house parent. "I went to college knowing what I wanted to be because I had this experience learning about what it looks like to care for someone for 24 hours a day," she says.

Her passion was further fueled by summers spent working at Alabama's Special Camp for Children and Adults, which offers year-round therapeutic recreation for people with physical and intellectual disabilities. "I learned so much more there than I did in my classes, and it influenced how I finished up my degree," says Dr. Meade. "Instead of choosing between K-6 or 6-12, I double majored and became K-6 and 6-12 certified for special education so I could work with both children and adults."

Soon after, she landed a job teaching elementary school in Birmingham before moving to Huntsville to lead the Autism Unit of Farley Elementary School. Two years in, however, she realized that her calling had yet to be answered. So Dr. Meade returned to school, earning a Master of Arts in Innovative Leadership and Administration and accepting a position with the Glenwood Autism & Behavioral Health Center in Birmingham. "From doing that job, I realized how

much I liked teaching teachers," she says. "I could teach one teacher and their whole class was impacted, so I felt like I had a broader reach."

That inspired the self-described "school junkie" to earn her Ph.D. with a focus in autism and behavior disorders, which in turn led to her present position as the head of the College's Autism Spectrum Disorder Graduate Program. Now she not only brings her professional experience to the curriculum, but also her personal experience as the mother of two young children, one of whom is enrolled at UAH's Rise School. "The burn-out rate for a special education teacher is very high," she says. "So if a mom is being difficult, you have to take a step back and think when was the last time she slept through the night or had an hour to read a book? Because having a child with special needs changes the dynamics of the whole home."

Dr. Meade uses her limited spare time to make a difference outside the

classroom as well. Since 2008, she has organized and run Camp Autism Smiles, a family-friendly camp that provides outdoor recreational opportunities for children with autism and their families. "It gives kids with autism an opportunity to experience an outdoor recreational event," she says, "and it provides respite to the parents." She and Dr. Melody Ng, associate professor of piano in the Department of Music, also recently received a \$5,000 cross-faculty grant to determine whether music is a stressor or something that can help young people with autism.

None of it would be possible, however, without the drive and desire she has to make a difference, as a parent and as a person. "I read a fortune cookie fortune once that said to find your place to stand and change the world," says Dr. Meade. "Well, I can't change the world, but if I can make a future teacher just a smidge more compassionate or empowered, then I've made an impact."



▲ Camp Autism Smiles, which is run by Dr. Meade, provides outdoor recreational opportunities for children with autism and their families.

# Invention to Innovation



U.S. Department of Commerce Assistant Secretary for Economic Development Jay Williams (third from left) visited the UAH campus to discuss the EDA's recent \$500,000 grant in support of the IC.

"The UAH Foundation is pleased to contribute \$2 million for the incubator. We regard that participation as an investment because we are confident that for many, many years to come that incubator will generate invaluable dividends to both the university and our community."

— UAH Foundation Chairman Dag Rowe

Last fall, UAH was awarded a grant of nearly \$3 million from the U.S. Economic Development Administration (EDA) to help fund construction of its proposed Invention to Innovation Center (IC). In October, the Board of the UAH Foundation voted unanimously to provide an additional \$2 million toward the project, and the State of Alabama appropriated in both fiscal years 2016 and 2017 additional construction funds.

The final pieces of the funding puzzle are currently being assembled. The business incubator will provide office and lab space to support inventors and entrepreneurs in the innovation process, build a virtual network of relationships to grow the innovation capacity within the region, and help reduce dependence on federal funding through economic diversification.

Instrumental in assisting UAH during the application process for the grant was

U.S. Sen. Richard Shelby's office. "We sincerely appreciate all the advice and assistance we have received and continue to receive from Sen. Shelby, and his unwavering support of UAH and Huntsville," says Dr. Ray Vaughn, UAH vice president for research and economic development.

Construction on the planned 45,000-square-foot facility is expected to start within a year. It will bring "shelved" technologies into the marketplace by identifying and funding entrepreneurs both at UAH and in the surrounding 15 counties.

"We want to take the applied sciences and the patents we have, and the patents at Cummings Research Park and out on Redstone Arsenal and at NASA, and use those technologies to start brand-new companies," says Dr. Vaughn. "And really, when it comes to science and engineering, our community right now doesn't have an incubator for those."

Dr. Virginia "Suzy" Young, director of UAH's Office for Proposal Development, agrees. "A lot of that investment is just sitting there," she says. "If it could be commercialized, it would have a huge impact on new business development in the region." She added that the IC will include room for anchor tenants, and that it will be designed to facilitate collaboration between academics, researchers, and business executives.

The incubator got a further boost this past February when it received an EDA grant for \$500,000 in support of its Growth & Acceleration of Products (GAP) project, which will probe the commercialization of "throwaway" technologies.

"It's not until you come to talk to the stakeholders that you fully appreciate the impact of the programs. There's a tremendous amount of growth and energy involved here," said U.S. Department of Commerce Assistant Secretary for Economic Development Jay Williams during a visit to the UAH campus.

The funding will also be used to hire personnel and establish the policies and procedures for the IC's operation in advance of its construction. "This will help us put in place the necessary processes to get a head start on the center's mission so we can be ready to operate as soon as possible," says Dr. Young.

"Since the Foundation's early history in the creation of Cummings Research Park, we have welcomed these opportunities to promote the great mission of the university while furthering the economic diversity and vitality of the area," said UAH Foundation Chairman Dag Rowe. "We believe the potential long-term implications of this critical investment could be simply outstanding, and commend President Altenkirch and UAH on this ambitious initiative."

# A Scientific Sea Change

Detection of gravitational waves confirms Einstein's general theory of relativity

For the first time, scientists have observed ripples in the fabric of spacetime called gravitational waves, arriving at the Earth from a cataclysmic event in the distant universe. This confirms a major prediction of Albert Einstein's 1915 general theory of relativity and opens an unprecedented new window onto the cosmos.

Gravitational waves carry information about their dramatic origins and about the

nature of gravity that cannot otherwise be obtained. Physicists have concluded that the detected gravitational waves were produced during the final fraction of a second of the merger of two black holes to produce a single, more massive spinning black hole. This collision of two black holes had been predicted but never observed.

The gravitational waves were detected on Sept. 14, 2015, at 5:51 a.m. Eastern

Daylight Time (9:51 UTC) by two U.S.-based Laser Interferometer Gravitational-wave Observatory (LIGO) detectors. The discovery, accepted for publication in the journal *Physical Review Letters*, was made by the LIGO Scientific Collaboration and the European-based Virgo Collaboration using data from the two LIGO detectors.

Dr. Tyson Littenberg, a research scientist with UAH's Center for Space Plasma and Aeronomic Research, helped the LIGO team develop sophisticated computer algorithms that comb through data and extract physical information from a detection. He was assisted by space science graduate student Jessica Page. Dr. Littenberg has been involved in LIGO-related research since 2007 and applied on behalf of UAH for the university to become a member of the LIGO Scientific Collaboration. UAH was accepted in 2015.

"Our job was to take a small segment of data that had been

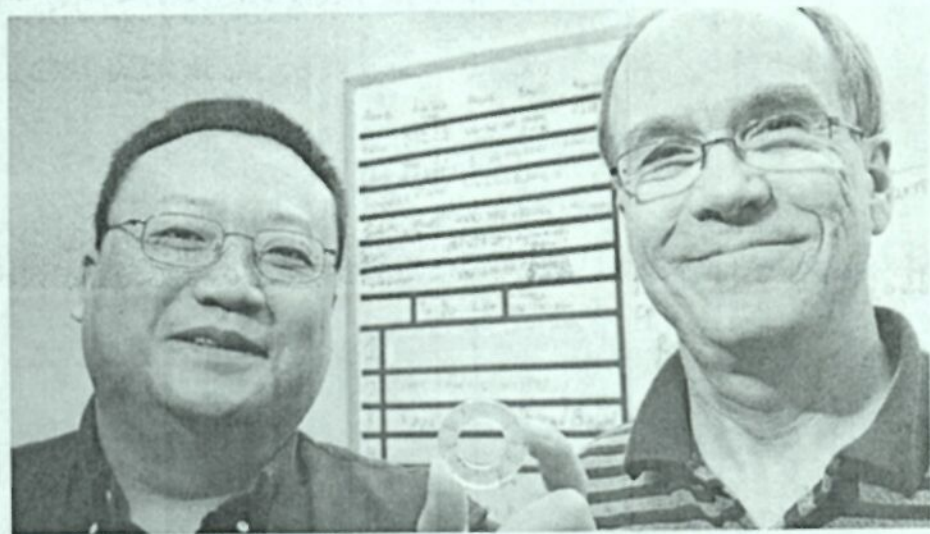
identified as being potentially interesting, and do an exhaustive analysis to figure out what the gravitational wave signal looked like in our detectors," he says. "It took months of analysis, re-analysis, checking, rechecking, and re-rechecking of the results before we were ready to say with confidence that we had something, and precisely what we had. The stakes were so high, we tried over and over again to prove ourselves wrong until, exhausted, we admitted defeat and said, 'This is really it.'"

The LIGO discovery has broad connections in the fields of fundamental physics, astrophysics, and astronomy. "The significance of this discovery cannot be overstated. Gravitational waves are the last missing confirmation of Einstein's general theory of relativity – our most fundamental understanding of how physics works in the macroscopic world," says Dr. Littenberg. "The scientific world changed forever on Sept. 14."



▲ Research scientist Dr. Tyson Littenberg, left, and space science graduate student Jessica Page helped the LIGO team with computer algorithms to extract physical information from the detection.

# Taking a Load Off



▲ Dr. Wang, left, and Dr. Hissam with a prototype piezoelectric washer in Dr. Wang's Huntsville Adaptive Structures Laboratory.

“When you tighten it up, this directly indicates how much force this washer is experiencing, which is directly related to the bolt’s preload.”

A piezoelectric load-sensing washer being developed by Dr. Gang Wang, assistant professor of mechanical and aerospace engineering, and Dr. David (Andy) Hissam, a mechanical and aerospace engineering doctoral graduate, provides a more accurate way to measure the clamping force exerted by the bolt on which it is placed. That could benefit numerous industries where the clamping force of bolts is critical, including construction, auto assembly, nuclear power, and aviation. “Any performance application will have a need for this,” says Dr. Wang.

A bolt’s clamping force, called preload, is generated as the bolt stretches during tightening. The two most common methods of applying preload are torque control and turn control. In torque control, a specified torque is placed on the fastener, typically with a torque wrench. In turn control, the nut is turned through a specified angle that stretches the bolt the desired amount. Both methods are only approximations of the true preload exerted because friction plays a major role in the readings obtained.

“When you use a torque wrench, you are measuring torque, not the preload,” says Dr. Hissam, who also works as a team lead at NASA’s Marshall Space Flight Center (MSFC). “You can be off the bolt’s specified preload by plus or minus 35 percent by using a torque wrench as an indicator because of the amount of friction involved, which is very difficult to quantify. That means, to get 2,000 pounds of preload on each bolt, a different torque value would have to be applied to each one.”

The new washer uses piezoelectric filaments connected to a handheld device that registers the preload value by reading the electrical output of the filaments.

Piezoelectric materials have the capacity to generate a voltage when they are subjected to mechanical stress. “When you tighten it up, this directly indicates how much force this washer is experiencing, which is directly related to the bolt’s preload,” says Dr. Wang. “Instead of a plus or minus 35 percent variance, we are shooting for a closer range, like 5 percent to 10 percent.”

The two have filed a NASA Disclosure of Invention and New Technology and received a 2016 MSFC Center Innovation Fund grant to test and refine the washer further. This will involve determining an appropriate low-cost material in which to embed the piezoelectric filaments, vibration and temperature testing, and trials to accumulate the data necessary to provide accurate preload readings.

“We want to be sure that when a technician tightens a bolt, he gets that specific value he is looking for every time,” says Dr. Wang. “We are also looking at what type of material we should use to surround the piezo-material that will provide an accurate reading and not break.”

If the elements can be preserved, Dr. Hissam says, “there should be no reason that it can’t be reused.”

# Lightning in a Bottle

A team of UAH scientists used the university's Rocket-city Ozone Quality Evaluation in the Troposphere Lidar to measure ozone that was chemically produced by summertime lightning over the United States. The Lidar facility is located on the top floor of the National Space Science Technology Center in Cramer Research Hall, and is one of just five such atmospheric Lidar facilities in the U.S. and about 15 worldwide.

"This is the first time in the United States that we have used high-resolution Lidar data to determine lightning's impact on tropospheric ozone," says Dr. Lihua "Lucy" Wang, a UAH Earth System Science Center research associate.

The troposphere is the lowest layer of atmosphere on Earth, and ozone in the troposphere can affect the air we breathe. "In the troposphere, ozone

is considered a bad gas," she says.

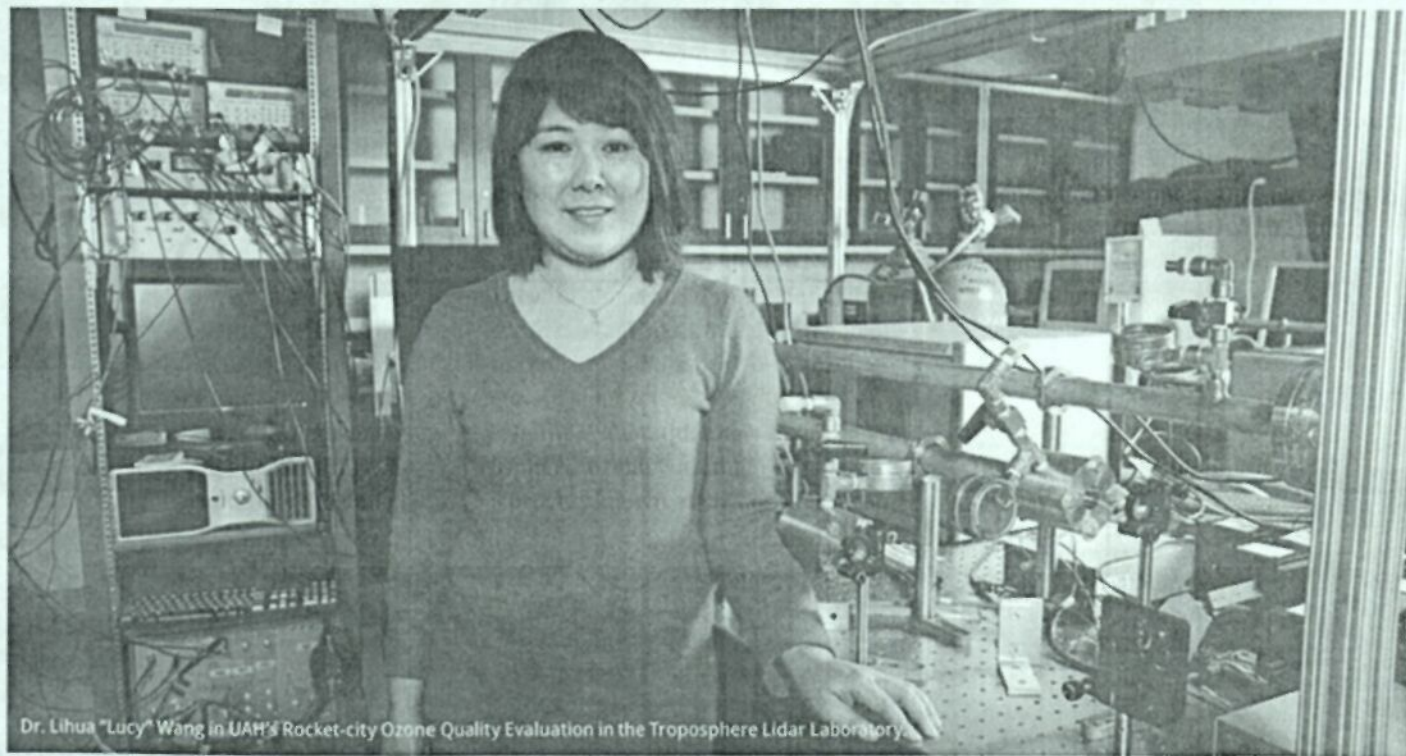
"It can worsen bronchitis, emphysema, and asthma." Its concentration can rise because of atmospheric conditions or it can result from human activities; if it exceeds 70 parts per billion, the U.S. Environmental Protection Agency issues an air quality advisory.

"We are investigating the processes that influence the ozone production," Dr. Wang says. The team began by estimating lightning nitric oxide emissions based on observations from the U.S. National Lightning Detection Network. They then measured the resulting ozone created by the lightning downwind of the storms and quantified the ozone enhancements due to lightning.

In the winter, the intermixing of stratospheric ozone with the troposphere – a process known as stratosphere-trop-

osphere exchange – is the chief means of ozone transport into our air. In the warm weather months, however, that process subsides and lightning bolts create significant ozone enhancements in the middle to upper troposphere, particularly in the Southeastern U.S.

"During the summertime, lightning produces very important ozone enhancements in the upper troposphere," says Dr. Wang. "When it introduces ozone into the upper troposphere, there is some downward transport mechanism that will affect lower tropospheric ozone." These first Lidar measurements of lightning-generated ozone have now opened a door to further research. "There are still many uncertainties in this research that we are trying to improve upon," she says.



Dr. Lihua "Lucy" Wang in UAH's Rocket-city Ozone Quality Evaluation in the Troposphere Lidar Laboratory.

# A Lasting Legacy

Late last year, UAH received a \$50,000 gift to preserve the legacy of Congressman Bud Cramer's 18 years of service as a member of the U.S. House of Representatives for District 5 of North Alabama. The funds will be used to help the university defray the cost of organizing, cataloging, maintaining, and preserving materials related to his service. These include more than 490,000 pages of legislative- and campaign-relat-



ed papers, constituent correspondence, news releases and press clippings, photos, and memorabilia, which will be kept in UAH's M. Louis Salmon Library.

"It is a privilege to have my work and accomplishments displayed at UAH," says Cramer. "This collection is something generations can view and enjoy for years to come. I want to thank UAH for their support and commitment on displaying my legacy."

Cramer was born and raised in Huntsville and served as Madison County District Attorney. He won election to the U.S. House of Representatives and assumed office in 1991, ably serving 18 years until his retirement from elected office in 2009.

"It was an honor to serve in the U.S. House of Representatives for 18 years, and I am proud of the prosperity and progress that I was able to bring to our district," he says. "I will continue to be an

advocate for our district in Washington D.C. for continued economic growth and moving North Alabama forward."

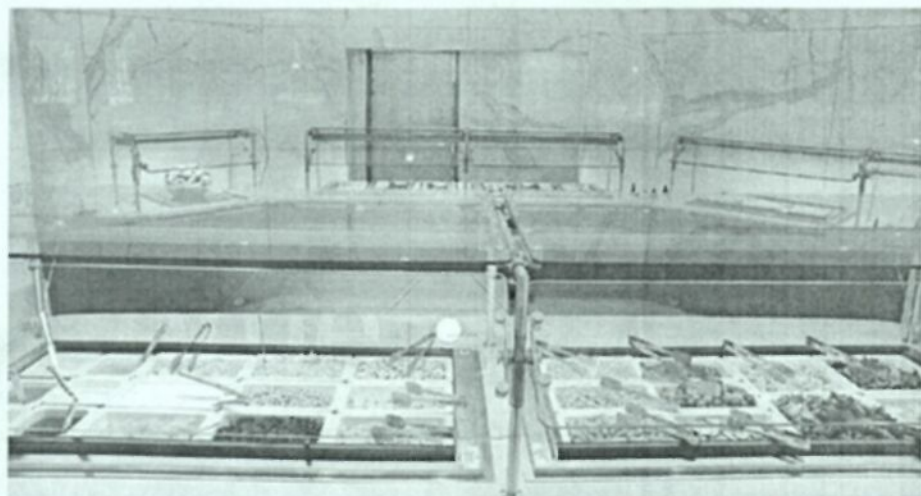
In 2004, one of UAH's research buildings was named for Cramer in honor of his support of the university. Today, Cramer Hall houses the National Space Science Technology Center, a collaborative research and education organization dedicated to advancing our knowledge of Earth science, space science, material science, biotechnology, propulsion, advanced optics, and information technology.

"Bud Cramer's service to our nation and District 5 was exemplary during his nine terms in Congress," says UAH president Dr. Robert Altenkirch. "Bud was a tremendous supporter of UAH, and his efforts played an important role in helping this campus grow to a very high level of excellence in education and research."





# Home Away from Home



◀ The Bevill Center Hotel is conveniently located on the UAH campus and offers a discounted overnight rate for guests affiliated with the university.

## Bevill Center Hotel is a convenient and affordable option for friends and family of the university

When you think about spending the night on a college campus, the first thing that comes to mind is probably a residence hall. But there's another option for UAH's friends, family, and visitors: The Bevill Center Hotel.

Located on Sparkman Drive next to the Central Campus Residence Hall and behind the Conference and Training Center, the hotel has long been considered Huntsville's best kept secret when it comes to affordability and convenience. "We're just down the street from the U.S. Space & Rocket Center," says Stilyana

Ruseva, Director of Sales. "And everyone associated with the university enjoys a special discount rate of \$80 a night plus tax, which includes free parking."

But while the price may be affordable, each stay comes with plenty of services and amenities. All of the hotel's recently renovated rooms feature a mini-fridge, microwave, coffeemaker, cable TV, and free Wi-Fi. "We also offer complimentary shuttle service within a 10-mile radius, so our guests can easily get to shopping and restaurants," she says. Not to mention free passes to the

University Fitness Center, which has a weight room, group exercise classes, and a heated indoor pool.

Another perk? Complimentary breakfast at the hotel's own Gardenvue Café, where hot meals are served three times a day, Monday through Friday, and guests can dine al fresco during the warm weather months. "Our menu changes daily, but there are some popular mainstays like Thanksgiving Thursdays and Catfish Fridays," says Ruseva, adding that every Wednesday is guest appreciation night at the Café's full bar. "If you're staying with us, you get dinner and two adult beverages for free."

As for those guests in town for more than just your average Wednesday night, the hotel is also a great place to host a graduation party or celebrate a milestone occasion with friends and family. But no matter what brings you to Huntsville – whether it's to tour the UAH campus, take in a Chargers home game, or simply spend time with a loved one – the Bevill Center Hotel makes a perfect home away from home. "Just give us a call!" says Ruseva.

Learn more at [uah.edu/bevill-center](http://uah.edu/bevill-center), or call now to take advantage of our special discounted rate! 256.721.9428 / 888.721.9428



COLLEGE OF NURSING

GRAND  
OPENING

Dr. Marsha Adams, Dean of the College of Nursing

The completion of construction on the \$17,000,000 renovation and expansion of the College of Nursing Building was celebrated with a ribbon-cutting ceremony shortly after the new year. Special guests included current nursing dean Dr. Marsha Adams and former nursing dean Dr. C. Fay Raines; UAH president Dr. Robert Altenkirch; former Trustee Paul W. Bryant, Jr.; current and former UAH faculty, staff, students, and alumni; and local elected officials and dignitaries.

Dr. Adams spoke briefly at the event. "With the university's focus on increasing student enrollment and retention, our new building will be able to support our growth," she said. "This will be the place where students will be educated to become professional nurses, advance practice nurses, and nurse leaders who will ultimately transform the health care delivery system."

With the original square footage now more than doubled to 88,000 square feet, the new building comprises classrooms, student gathering spaces, faculty offices, a 250-seat auditorium, and a 10,615-square-foot Learning and Technology Resource Center (LTRC). A state-of-the-art facility, the LTRC features a 16-bed hospital lab, a 16-table assessment room, six high-fidelity manikins, four Advanced Practice provider clinical examination rooms, five high-fidelity simulation laboratories, an obstetric/pediatric four-bed laboratory, an IV practice room, a Pyxis® medication room, a home-health simulation room, and two debriefing rooms. The building was also brought into compliance with accessibility standards, the mechanical system was updated, and a larger elevator was added to accommodate medical equipment.



“This will be the place where students will be educated to become professional nurses, advance practice nurses, and nurse leaders who will ultimately transform the health care delivery system.”



# A Lesson in Perseverance



“Often young people are too afraid to do the things that they love because they are trying to follow the ‘most logical’ path,” Huff says. “Whatever you decide, do not get discouraged.”

Growing up in foster care, Sacred Huff knows what it's like to face adversity. Yet the Toney, AL, native has never shied away from challenges, consistently setting – and meeting – the most ambitious goals. “I am a firm believer that you can accomplish anything that you truly set your mind to,” she says. Her ultimate goal is a career in the law. “My heart is set on being a lawyer, and I don't believe anything is going to stand in the way of that.”

Huff excelled academically as a student at S.R. Butler High School in Huntsville, graduating in the top 10 of her class and receiving both a Kids to Love Foundation scholarship and the National Exchange Club's Accepting the Challenge of Excellence award. After being encouraged by her professors at Calhoun Community College to further her education, she enrolled at UAH. “It was one of the best decisions I have made,” she says.

Once there, she majored in sociology – “It allows you to become more conscious of the world,” she says – and pursued the

law and justice track offered by the Sociology Department. She also consistently made the dean's list and was inducted into the Alpha Kappa Delta International Sociology Honor Society, the Pi Sigma Alpha National Political Science Honor Society, and the Order of Omega National Greek Honor Society, despite having a heavy course load and serving as guardian for her youngest sister.

Needless to say, it wasn't easy. At times, she says, “I thought a profession in law would be unrealistic, and I would get discouraged.” But she wasn't about to give up. “I continued to persevere in order to achieve my goals.” And in the end, her dedication was rewarded in a big way. After graduating from UAH this past fall, Huff was accepted to George Washington University Law School and awarded a merit scholarship that will cover more than half her tuition.

Now her plan is to specialize in constitutional and civil rights law. “I believe that it is necessary for a democratic country to have people who understand and are willing to advocate for the rights of all the people,” she says. “I hope to be one of the leaders in battling injustices and putting forth solutions to the many issues that continue to plague the legal system.”

She also hopes her own experiences will encourage others to stay the course when it comes to achieving their goals. “Often young people are too afraid to do the things that they love because they are trying to follow the ‘most logical’ path,” she says, pointing to Michael Jordan as a perfect example of someone willing to try – and try again – in spite of obstacles. “Whatever you decide,” she says, “do not get discouraged.”



ALUMNI

# Hitting the Right Notes

## Love of music turns into full-time job for UAH alumnus

By the time Matt Hendrix reached high school, he thought he was done with playing the flute. "I hated it!" he says with a laugh. His parents, however, had other ideas. "They said I had to try it for at least a year, and then if I still didn't like it, I could quit."

Their gamble paid off. Hendrix did end up liking it again. In fact, he spent the next four years playing with the Grissom High School band before going on to earn a degree in music education from UAH. Now he works full time as the band director of Whitesburg P-8 (formerly Whitesburg Middle School) and part time as the director of the UAH Pep Band. "I'm happy because I get to do what I love," he says.

A Huntsville native, Hendrix had long planned to attend UAH, the alma mater of both his father, math major John Hendrix, and sister, education major Beth Hendrix. He just couldn't decide whether to pursue a degree in art or

music – until, that is, he attended UAH Theatre's production of the opera "Pagliacci" the summer before his freshman year. Soon after, with his sights set on becoming a middle or high school band director, Hendrix declared a music education major. "The education classes taught me a lot about organization," he says, "while the music classes gave me content knowledge and the practical skills I needed to teach."

Hendrix also took every opportunity to gain hands-on conducting experience, putting into practice the techniques he was learning in his conducting classes. "I got to go to some of the middle and high schools and guest conduct their bands," he says, adding that he was even asked back to his alma mater Grissom High School. "That was incredibly stressful!"

By the end of his senior year, he had not only taken over as the director of the UAH Pep Band, but he had also landed his full-time job with Whitesburg

P-8. His current workload consists of five band classes that he teaches at the sixth-, seventh-, and eighth-grade levels. "I teach them the ins and outs of their instrument along with the music theory side," says Hendrix. Fortunately, he himself knows how to play all of them, including steelpans thanks to a stint with the UAH Steel Drum Band.

As for his weekends, they're typically spent at the Chargers' home hockey and basketball games, directing the UAH Pep Band. "It gets pretty crazy, but the student leaders for the band are phenomenal," he says. "Honestly, they take care of about 90 percent of the logistics." That leaves him free to devote the rest of his time to his new wife, alumna Cristen (Matlock) Hendrix, a nursing major who has since returned to UAH to pursue her master's degree in the field. No doubt they'll soon be talking their own kids into playing the flute for just one more year...



## An Army of Support

### A military wife and mother of three earns her master's in education

Theresa "Trace" Gibson gives new meaning to the phrase multitasking. Last December, the military wife and the mother of three graduated from UAH's College of Education with a master's degree in English with a secondary education certification. And despite an accelerated schedule that had her taking five classes during the fall and spring semesters, and four classes during summer semesters, she still managed to achieve a 4.0 GPA.

Yet the Bainbridge, GA, native is quick to credit others with her success, in particular her children Kennedy, 11, Schaffer, 6, and Drew, 4, and her husband Adam, currently serving a tour of duty in the Middle East. "My kids made the biggest sacrifice – less time with their mom – as did my husband, who took over many of my parental duties before he deployed so I could spend time studying and in classes,"

she says. "I am grateful for their sacrifices and support, and really see them as the true heroes in my story."

Gibson's commitment to academic success, however, is nothing new. In high school, she was voted "most talented," graduating at the top of her class before going on to earn her bachelor's degree in English from Brigham Young University. There she met Adam, who soon became both her husband and her inspiration. "He has completed several advanced degrees since we've been married, so he is a stellar example to me of dedication and hard work, with both his career, and in school," she says.

But with the family moving around the country regularly with Adam's military career, Gibson had to put her own educational plans on hold until a couple of years ago, when the family settled in Madison County. Only then was she able to enroll at UAH and focus on becoming

a teacher – an experience she describes as "informative, really fun, and truly inspiring" thanks in large part to the support she received from her professors and peers. "So many guided and encouraged me and made this journey not only possible, but also really fantastic and fun," she says. "I found some truly great friends."

She also found full-time employment; Gibson was recently offered a position at a local high school. "Being given the chance to inspire and encourage students – really showing them their individual worth and potential – is a dream job for me," she says. And while her path to get there hasn't been easy, she knows the hard work she put in is worth much more than a paycheck. "It's been a great opportunity to be an example to my children," she says, "demonstrating the dedication needed to complete college."



## HIGHLIGHTS



## ATHLETICS



More than 100 academic awards were handed out to UAH student-athletes during the 2015-2016 academic year.



**MEN'S AND WOMEN'S LACROSSE** began their inaugural campaigns in the spring, bringing the university's sponsored programs total to 18.



**MEN'S BASKETBALL** captured the GSC regular season title for an unprecedented sixth time in seven years and earned the right to host the NCAA South Regional tournament for the third time; the team also featured a pair of all-region selections.



**MEN'S SOCCER** finished second in the regular season and advanced to the GSC tournament semifinals.



**VOLLEYBALL** earned its fifth consecutive appearance in the GSC tournament.



**SOFTBALL AND BASEBALL** were both featured in the national rankings yet again.



**WOMEN'S INDOOR TRACK AND FIELD** had a pair of runners earn All-American status at the NCAA Division II Indoor Track and Field national championships.



**WOMEN'S CROSS COUNTRY** sent one runner to the NCAA Division II national championships who came away as an All-American.



**MEN'S CROSS COUNTRY** finished second at the GSC championships and featured three all-GSC performers.

## SOCIAL MEDIA

Check out our most popular social media posts from the last few months.

Tell the world why you've got the #ChargerLove! Charger Love Day is Feb. 14th. Post about your fav thing at UAH!

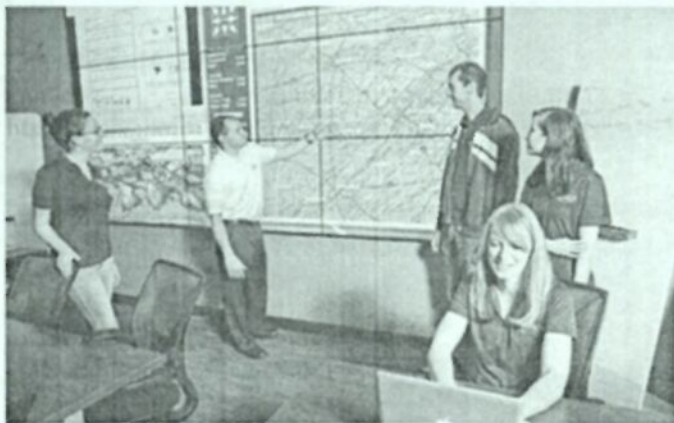
UAH business incubator project gets \$500,000 U.S. Dept. of Commerce boost <http://on.uah.edu/1SkqEc>

Daniel Rochowiak named Director of UAH's Quality Enhancement Plan and Collaborative Learning Center <http://on.uah.edu/1SkqFiC>

Local middle schoolers speak to ISS astronaut with help from @UAH\_SHC. Watch the video! <http://on.uah.edu/1XILjDD>

It's @UAH\_ChargerCon time! April 2, 1-10 p.m. at the CU. Free admission and open to the public!

Couldn't have asked for nicer weather for Admitted Student Day. Welcome to all our prospective students and their families! #UAHinbloom



▲ Prepping our radar, profiler, lightning, and sounding systems for pre- #VORTEXSE severe wx ops tomorrow. #HUNwx #alwx



facebook.com/UAHuntsville



@UAHuntsville





## PHONATHON

UAH's most recent phonathon campaign, staffed by 25 student callers, came to a close in late April after kicking off last October. And once again it proved a great success, with **\$119,000** given and pledged by the university's alumni and friends.

"Many of the donations came from alumni who wished to give back to the specific college from which they graduated," says Jennifer Brost, Director of Annual Giving. "No matter what the motivation, we appreciate the support and generosity that all of our donors showed over the course of the campaign. UAH and its colleges couldn't continue their success without them!"

The university's next phonathon campaign will launch in September, though donations can be made at any time on the UAH website by visiting [uah.edu/giving](http://uah.edu/giving). For more information, please contact Jennifer Brost at [jennifer.brost@uah.edu](mailto:jennifer.brost@uah.edu) or 256.824.6853.

## DRIVE WITH PRIDE!



UAH license plates generate scholarship dollars and are a great way to show your Charger pride. Just ask for your "UAH Collegiate Plate" at the License Department or write "UAH Collegiate Plate" on your mail-in license plate renewal. You can even personalize it! Learn more at [revenue.alabama.gov/motorvehicle/UAH.cfm](http://revenue.alabama.gov/motorvehicle/UAH.cfm).

**THANK YOU FOR SUPPORTING UAH AND STUDENT SCHOLARSHIPS!**

The Class of 2016  
celebrated UAH  
commencement  
on May 1, 2016



More than 800 undergraduate and graduate degrees were awarded at UAH's Spring Commencement Ceremony held on Sunday, May 1, at the Von Braun Center's Propst Arena. The commencement address was given by Alabama Senator Jeff Sessions.



**UAH**  
THE UNIVERSITY OF  
ALABAMA IN HUNTSVILLE

301 Sparkman Drive  
Huntsville, Alabama 35899

UAH.EDU

Nonprofit Org.  
U.S. Postage  
PAID  
Huntsville, AL  
35899  
Permit No. 283

The University of Alabama in Huntsville  
is an EEO/AA/Title VI/Title IX/Section  
504/ADA/ADEA institution in the provision  
of its education and employment programs  
and services.

**#1** HIGHEST AVERAGE  
STARTING SALARY  
AMONG ALL ALABAMA  
GRADUATES  
- College Scorecard

**UAH**  
THE UNIVERSITY OF  
ALABAMA IN HUNTSVILLE

**#1** in Alabama for  
the *Best Return*  
on Investment  
— Best Colleges

**"VERY COMPETITIVE"**

— Barron's Profile of  
American Colleges

**MOST AFFORDABLE**  
public university in Alabama

— Self Lender

UAH was named a national  
university where students  
are **EAGER TO ENROLL**

— U.S. News & World Report



**27.2**  
AVERAGE FRESHMAN  
ACT SCORE

*among the highest in Alabama*