eGEOTIGER

January 2023

New Faces

Brian Boston

Assistant Professor

Richard Vachula

Assistant Professor

Aja Ransaw

Workstudy

Highlights Inside This Issue

In Memory of Md Sharif Mustaque

Remembering Md Sharif Mustaque

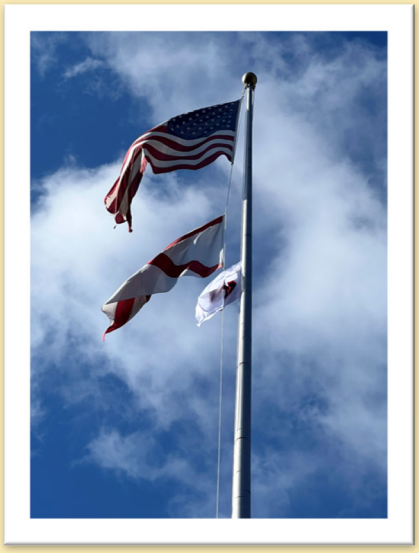
Md Sharif Mustaque joined the Department of Geosciences as a PhD student in Fall 2018 after earning a master's degree from City University of New York under the supervision of Dr. Cecilia McHugh. As a follow-up of his MS work, Sharif had a plan to work for PhD at Auburn on sediment provenance and hinterland tectonics of the Indo-Burman ranges. Upon his arrival at Auburn, he however became interested to work on tectonics of the Permo-Carboniferous Gondwana sediments at the Indian subcontinent, Australia and Antarctica. Sharif went to Bangladesh and collected sediment core samples from two new drill wells at the Indian Platform. When he drafted a PhD dissertation proposal in Fall 2019, COVID-19 hit the world. Although Sharif and I had visa to do fieldwork in India, but we could not travel. That changed the contents and directions of his doctoral project. He modified his project as, "*A multi-proxy approach to understand sedimentary basin evolution: focusing on sediment provenance, facies studies and structures in Permo-Carboniferous basins*." This updates included the Black Warrior basin of the Appalachian foreland basin along with the rift-basins of eastern India, Australia and Antarctica. He then passed his PhD qualifying examinations and became a PhD candidate. He stared drafting papers from his PhD research and was on target to defend his dissertation and graduate in Spring 2023 as he had a potential post-doc opportunity at Columbia University to work on IODP sediment cores from northern Indian Ocean.

Sharif passed away at the East Alabama Medical Center on January 5th, 2023. Sharif's family and friends, including his mother, father and sister were by him during his passing. Dr. George Flowers, Dean of the Graduate School asked me if we would want to have Sharif receive a Posthumous PhD degree. I consulted with Sharif's dissertation committee who agreed on that Posthumous degree. Our COSAM Dean Dr. Edward Thomas also agreed to proceed on with the proposal to the AU provost's office. On February 3rd, 2023, Auburn University Board of Trustees approved a Posthumous PhD degree for Md Sharif Mustaque which will be awarded on May 6, 2023, at the Spring graduation ceremony of Auburn University.

The AU office of *Auburn Cares* honored Md Sharif Mustaque by flying a flag at Samford Hall on Monday, January 9th, 2023. Graduate students, staff and faculty members of Geosciences attended the flag flying event and spent a moment of silence to show respect to Sharif Mustaque. Additionally, *Sigma Gamma Epsilon* and *AAPG* of Auburn University hosted a hike at Chewacla State Park on February 3rd, 2023, to honor Sharif as he always loved hiking.

Sharif's passing has brought uneasy times at the Department of Geosciences. We miss Sharif Mustaque. This was too early for him to leave us!

In Memory of Md Sharif Mustaque



Department of Geoscience Group photo at the flagpole in honor of Sharif.

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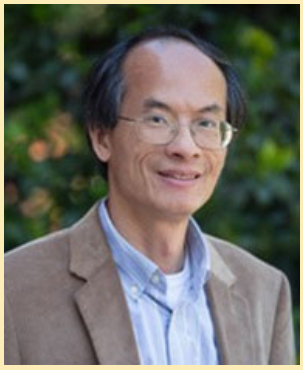
Greetings from the Chair!



This is my fifth year to serve as the chair of this superb department and it has been a great joy and honor to live my dream surrounded by such extraordinary students, faculty, staff, alumni, and friends. Ideas have sparkled along the hallways, offices, and conference rooms and I am so happy that we are returning to face-to-face interaction and instruction after turbulent times. I want to take this opportunity to give my heartfelt thanks to you all for the incredible amount of work everybody put in to get through this challenging year. Our work is scientifically serious but socially engaged. These are very exciting times to be in the field of Geosciences.

The Department of Geosciences is a vibrant growing department on the move to provide an enriched and collaborative learning environment. The Department offers various degree programs in Geology, Geography, and Earth System Science, creating a unique environment for promoting team-based approaches to explore and solve problems regarding Earth's environment and human societies. Currently we teach large number (6) of university core courses, giving the department a large reach to students with diverse background and interest. Our faculty expertise is broad, and we have active research programs spanning a wide range of investigation from environmental geosciences, solid earth processes, earth and life through time, natural resources, natural disasters, geospatial sciences, human-environment interaction, and geoscience education research. A well-balanced emphasis of field studies, laboratory analysis, and technology-enhanced data collection and modeling allows us to better train the next generation of Earth and environmental scientists.

Our plan over the next five years is to continue building our capacity through strategic hiring and investment in educational infrastructure and key research areas (e.g., isotope and trace-element geochemistry, geospatial science, water, climate, and environment). A new modern "STEM-Ag" building expected to be open in 2025 would consolidate all faculty, students, programs, and research facilities under one roof, which is critically needed to elevate the department to national prominence. Moreover, our departmental faculty, students, staff have worked together to ensure that the department continues to provide a welcoming, diverse, and inclusive environment for all and fosters the development of community within the department.

We never forget that it is a great privilege to get to teach all Geosciences students. My job as chair has one simple goal: to help all of our students and faculty become the best researchers, teachers, and leaders they can be, and help them strive for excellence in their professional pursuits. However, I can't do it alone. It is important for all of us to be committed to the challenges of making our academic journey brighter and better. Please feel free to contact me if you'd like to learn more, and of course, come back to visit as soon as possible.

Academic Classroom and Laboratory Complex

The Academic Classroom and Laboratory Complex, or ACLC, is a new 151,000-square-foot facility adjacent to The Edge at Central Dining and Auburn Amphitheater that features adaptable classroom spaces, labs, relaxation and study areas, lecture halls and atriums and can accommodate up to 2,000 students at a time. The building's bottom level features a trio of spacious lecture halls with seating for 96, 200 and 300 students, respectively, and faculty will have the ability to record and broadcast their lectures utilizing the facility's audio-visual technology.

In addition, the facility's laboratories are equipped with numerous work stations and preparatory lab spaces that include refrigeration units, HVAC systems and safety showers. Designed as flexible teaching spaces, the rooms offer dual functionality as both laboratory or classroom instruction areas.

With more than 30 total classrooms and laboratories available, ACLC stands second to only Haley Center in total classroom space on Auburn's more than 2,100-acre campus.

"The ACLC is a strategic investment in Auburn's next-generation learning spaces and reflects our institution's commitment to building for the future," Interim Provost Vini Nathan said. "Following years of planning and development, the ACLC represents how technology and design can effectively facilitate innovation and collaboration, contributing to an exceptional experience for our students."

The innovative facility also is the new home for the Biggio Center for the Enhancement of Teaching and Learning, a resource for Auburn faculty that "engages, supports and empowers the university's academic community in each phase of the scholarly teaching transformative learning process." Faculty members can utilize meeting and office space, relax and recharge in common areas and work with Biggio Center staff and other colleagues to share innovative teaching and learning approaches.

"The ACLC showcases Auburn's commitment to student-centric and innovative teaching and learning," said Asim Ali, executive director of the Biggio Center. "By embracing the unique features of the spaces, such as movable furniture, group seating, screen sharing and glass boards, our faculty are creating an engaging environment that leads to stronger learning outcomes."

An entire hallway of windows provides a panorama view of a beautiful green space which use to be known as the Amphitheater.

The design of the ACLC includes wood from the pine trees that were removed from the site during construction.

Dr. Hames touring the new ACLC prior to opening.

STEM COSAM Outreach

Over 800 middle school students experience the wonders of science at 2022 Destination STEM hosted by COSAM's STEM Outreach Center. Destination
STEM gave students the chance to explore a variety of exhibits
and introduced them to the wide range of opportunities off ered through COSAMon October 20 in the Beard-Eaves Memori-
al Coliseum. Destination STEM was hosted by the STEM Outreach Center in Auburn University's College of Sciences and Mathematics, or COSAM.

For an exciting day of exploring interactive exhibits andch atting about STEM careers,
over 800 sixth through ninth grade kids from 13 rural Alab ama schools joined COSAM
and Engineering instructors, staff, and students.

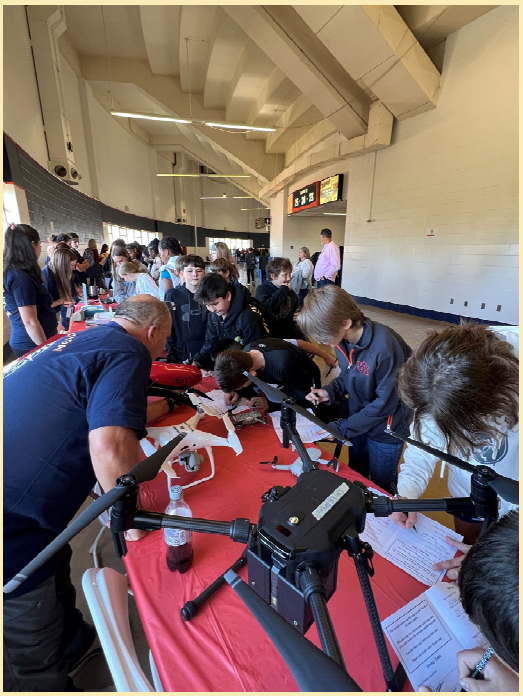
Students had the opportunity to see Auburn University's campus through an open house style, explore more than 50 interactive stations along the Coliseum's floor and third floor concourse at their own leisure, and get a firsthand look at the many wonders of science.

Students toured exhibits along the concourse on the third floor that included the Theremin (an electronic musical instrument controlled without the performer's physical involvement), a terrifying Van de Graaf Generator that displayed static electricity, a rock-solid Geosciences collection, a coronavirus in 3D, laser harps that projected DNA images, Alabama botanical oddities, and more. Some exhibits allowed kids to participate in probability games at a math carnival, fold mathematical puzzles, and examine fruits and vegetables under microscopes. Students may see live biomimicry demonstrations, an invasion of insects, and Alabama-specific reptiles like the enormous Eastern indigo snake and the checkered corn snake on the floor of the Coliseum. Along the floor, students engaged in an interactive computer game about natural selection while learning about heredity, as well as interactions with several robot kinds from the Southeastern Center of Robotics Education (SCORE).

In addition to the multitude of STEM exhibits, COSAM's STEM Outreach Center had admissions, student services, and scholarship representatives on hand to speak with students, as well as a "Career Corner" that featured successful female Auburn STEM graduates to share their career experiences.

Throughout the morning, students gained an increased awareness of opportunities in STEM fields in an exciting, hands-on manner and walked away with a greater appreciation of how scientists can make meaningful impacts throughout the world.

COSAM's STEM Outreach Center would like to thank the 150 volunteers that made this year's Destination STEM event a huge success.



First 'Climate Event' shares importance of climate resiliency and NRT student research

2022 Climate Symposium

The NRT collaborated with the Office of Sustainability to put on the first annual Climate Symposium. The half-day event held in the AU Student Ballroom Center last March was designed to share research on climate-related hazards and problems, sustainability, and building resilience with local climate researchers and then have some solution-based discussions with climate-interested community combating the angst with climate change. The format of the day started with a luncheon with Keynote speaker, Dr. Chandana Mitra, followed by lightning talks from climate researchers from faculty from Auburn University, University of Alabama Huntsville, University of South Alabama and some representatives from government and GNOs. Then followed graduate student poster presentations on climate research from students from AU, Florida A&M University and University of South Alabama and a networking reception. The Teach-In portion of the evening led by the Office of Sustainability was more focused for climate-interested students and community with speakers: Daniel Tait, on renewable energy and EVs, Kelly Strickland, School of Nursing, on climate impacts on public health, Ryan Thompson, Rural Sociology, on climate justice, Mark Wilson, Community & Civic Engagement, on organizing for climate action. The NRT Trainees facilitated table discussions with the participants and practiced their science communication skills. The NRT program was happy to report back the numerous connections made at their first symposium. The benefits to this one event has now led to a 2nd funded climate symposium scheduled for Tues March 21st, 2023. The 2023 symposium will have a water-climate focus as the Water Resources Center is now partnering with the NRT Program to host the event. You may still register for this event until March 6th at aub.ie/AUWaterClimate

2022 NRT Immersion

Back in 2019, the faculty proposers of the AU NSF Research Traineeship (NRT) Program on Climate Resilience dreamed to kick off the program each year to the new cohort with field experiences for Trainees to directly observe climate-related impacts, risk, recovery, and critical issues affecting the study region from recent disasters. Three years later with the setbacks of COVID-19 pandemic, the NRT program was finally able to have that kick-off Immersion experience as hoped with their 2nd and 3rd cohorts. The group went to Weeks Bay Nature Reserve, a member of the National Estuarine Research Reserve System, in the Fairhope, AL. The experience included an impacts-discussion tour including the Hurricane Katrina Memorial, the Biloxi bridge system and sea wall and a comparison of East Biloxi Neighborhoods. There were guest speakers representing different stakeholder groups and another day of a boat tour of the estuary with discussion. It was a lot of information and a lot to do before the fall semester. But, as some trainees described, their most enjoyable parts were, “meeting other scientists and hearing about how they approach similar topics through different means.” and “the Hurricane Katrina stuff was truly the best part. Going out and seeing climate resilience in the real world was very eye opening” made it all worthwhile.

Urban PRism goes to SEDAAG

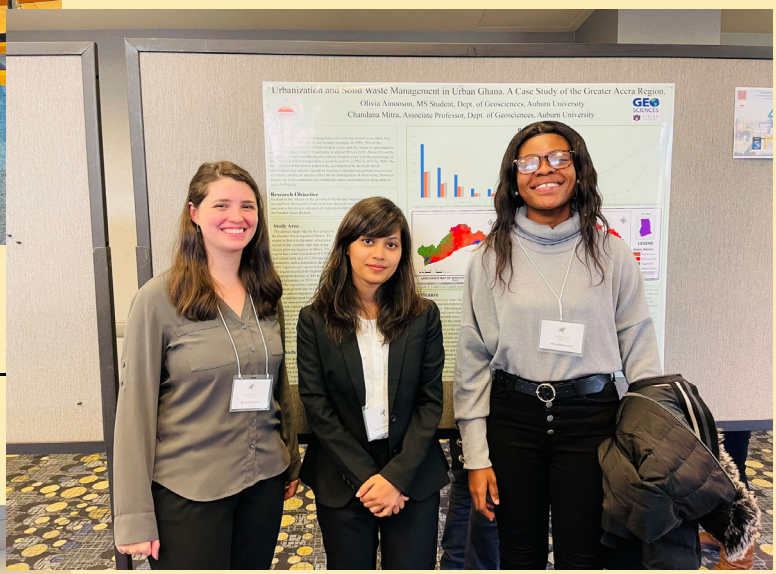
UrbanPRism Group

Brandon Ryan, Subhasis Ghosh, Nazifa Tasneem, Miranda Silano, Olivia Ainooson

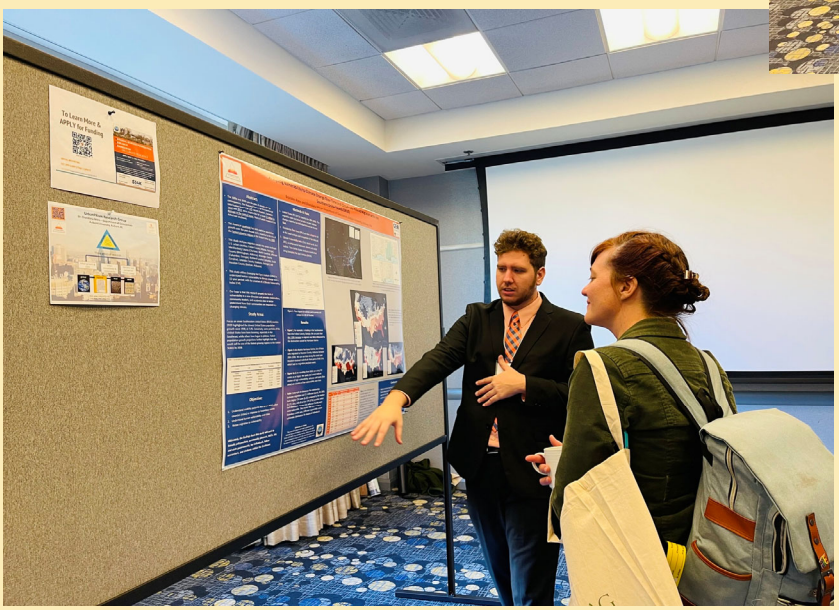
The Southeast Division of the American Association of Geographers (SEDAAG) was held in Atlanta, GA at the Georgia Tech Hotel and Conference Center November 2022. A group of Auburn University Students in the Geoscience Department presented their research. Pictured below are the posters presented at the conference.

Miranda Silano, Nazifa Tasneem, and

Olivia Ainooson



Brandon Ryan



SEDAAG is a regional subdivision of the American Association of Geographers, representing approximately 500 members in Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia and West Virginia.

Established in 1947, SEDAAG exists to advance investigators in geography and to encourage the application of geographic findings in education, government, and business. The Division supports these objectives by organizing an annual academic conference which was hosted at Georgia Tech in Atlanta, Georgia for 2022.

Earth Day Extravaganza 2022

Earth Day is the largest non-religious day of recognition, and it becomes an increasingly important day to celebrate as everyone from world leaders to everyday citizens search to identify ways to maintain a healthy environment and planet. Auburn will celebrate Earth Day with several entertaining and educational events. The year's Earth Day Extravaganza will be hosted at the Student Center Greenspace, where students will celebrate the planet and promote sustainable living.

The first Earth Day was April 22, 1970, the culmination of public outrage over the Santa Barbara spill, the Cuyahoga River in Cleveland catching fire and burning—as it had several times over decades—and numerous other noticeable and growing assaults on the environment and public health. Twenty million Americans demonstrated the largest public demonstration in American history until the George Floyd anti-racism demonstrations in 2020.

By the end of 1970, the U.S. Environmental Protection Agency, or EPA, had been created, and several first-of-their-kind environmental laws were passed in the early 1970s. As former Sen. Gaylord Nelson stated, "Our goal is not just an environment of clear air and water and scenic beauty. The objective is an environment of decency, quality and mutual respect for all other human beings and all other living creatures."

Today, more than a billion people and 193 countries celebrate Earth Day.

Earth Day Extravaganza 2022

Drone Demo by Tony Hall

Sion Brunson and Dr. Mitra presenting a poster for Earth Day 2022.

Dr. David King publishes forth edition of Alabama Dinosaurs book

While doing field studies in July 1982, Auburn University Professor David King discovered the most complete eastern North American tyrannosaurid dinosaur specimen, later named *Appalachiosaurus,* in a small hill located in the southeastern part of Montgomery County, Alabama. This discovery led King down an unforeseen personal research path, resulting in many rewarding opportunities – one in the form of a book. In the latest edition of *Alabama Dinosaurs*, King builds on the knowledge he has gathered from that unique finding years ago, introducing the next generation of curious learners to the fascination of dinosaurs.

King, a professor of geology in the College of Sciences and Mathematics, published the fourth edition of *Alabama Dinosaurs* in February 2022.

“This edition is intended for use by a general audience, including high-school and college students,” said King. “While it can be used as a textbook, I wrote this latest edition because I wanted to produce an updated book for anyone interested in dinosaurs, especially eastern North American dinosaurs.”

Published by *Sentia Publishing* and available on Amazon, the fourth edition contains newly synthesized data and fresh interpretations about eastern North American dinosaurs in general and Alabama’s dinosaurs.

“In Alabama, there were at least five main groups of dinosaurs which are all discussed in the book - what they looked like, where they lived, how their fossils are found, and other items of interest about them and about Alabama during the time they lived here. This edition contains many new figures, including an Appendix of historic photographs related to the type specimen of *Appalachiosaurus*,” said King.

King’s idea to publish a book originated from a series of events that followed his unexpected discovery.

The most current reconstruction of the Appalachiosaurus in the Tellus Museum in Cartersville, Georgia

“Finding the initial bones that led to the excavations of the *Appalachiosaurus* type specimen was an incredibly rare and life-changing event, which I definitely did not see coming,” said King. “After the discovery, I tried to learn all that I could about dinosaurs, especially dinosaurs in the Alabama area, and I started thinking about how I could integrate my new knowledge into my teaching. After the first *Jurassic Park* movie came out in 1993, there was considerable public interest in dinosaurs. Not long after, I started a community education class on Alabama dinosaurs, which soon became an elective class for course credit at Auburn. This book got started initially as course notes for those classes.”

Editions of *Alabama Dinosaurs* have evolved over the years based on King’s educational intent and the availability of new information to share. Printed by photocopy in 1994 at Auburn University’s printing services, King’s first edition was written for his community education classes at Auburn and copies were handed out free to students following the classes. A second, longer edition was printed by the Auburn University Bookstore in 1996 and was written for King’s new, directed-study class at Auburn on Alabama dinosaurs. King self-published the third edition in 2002 with the intent of a global edition to be sold to the public. It was sold at the Auburn University Bookstore and was later placed on Amazon.

Alabama Dinosaurs is one resource King uses in the Geology 3300 course that he will teach this summer at Auburn.

“The course covers the history of investigations of all southeastern dinosaurs and the latest information on them,” said King, “plus other land and sea-dwelling creatures of the area during that time (Late Cretaceous). Students taking the course will get to examine replicas and go to a site to look for dinosaur bones.”

“Had I not embraced dinosaurs as a topic of personal research years ago, I would not have had a lot of really rewarding experiences in teaching and taking individuals on field trips to look for fossils over the years.”

In November 2021, Dennis Pillon of AL.com interviewed King about the 1982 *Appalachiosaurus* discovery as part of a two-part series called “Ancient Alabama”. Pillon’s article, which provides in-depth detail of the discovery process and shows fascinating images from the actual dig, can be found here.

Discovery of Appalachiosaurus – 40 Years Later

On July 2, 1982, while doing field work on the Selma Group of chalks and marls in central Alabama, I came upon a small outcrop of chalky marl a short distance north of the tiny town of Downing in Montgomery County, Alabama. This outcrop of chalky marl contained bones that were weathering out and falling down the face of the embankment only a few meters from the road. This spot on a rural road, Montgomery County Road 101, thus became the place where the most complete eastern North American tyrannosauid dinosaur known to date was recovered. This specimen, which eventually was named *Appalachiosaurus montgomeriensis*, is also known as "Auburn's dinosaur."

The specimen, which is about 40 percent complete, was excavated first by Auburn University faculty and later by a group led by the Red Mountain Museum in Birmingham (now known as the McWane Center). This period of excavation spanned 1982 to 1986. Eventually, a partially reconstructed skeleton was put on display at the now-defunct Red Mountain Museum, and later, a fiberglass replica specimen was placed on display at the McWane Center, where is still stands today. There is a similar replica also at the Tellus Museum in Cartersville, Georgia.

On the occasion of the 40th anniversary of this serendipitous discovery, I returned to the spot on Montgomery County Road 101 with the reconstructed skull of *Appalachiosaurus* to commemorate this significant event in the history of Alabama paleontology. A reporter from the *Montgomery Advertiser* and a photographer were there with me, and a short story with photos and a video appeared in the *Advertiser*'s on-line content at this link:

https://www.montgomeryadvertiser.com/story/news/2022/06/29/appalachiousaurs-alabama-discovery-1982-recalled-by-auburn-professor/7636101001/

Last year, a similar story appeared on the web page of *AL.com*, and can be seen at this link:

https://www.al.com/news/2021/11/in-search-of-appalachiosaurus-t-rexs-alabama-cousin.html

I have recounted this discovery in the new edition of my book *Alabama Dinosaurs* (4th ed., 2022), which was published this year by Sentia Press of Austin, Texas, and is sold on Amazon.com.

On July 2, 2022, a group of us celebrated Appy's 79 millionth birthday, and his skull attended the party.

It is my hope that a replica of this dinosaur can be purchased for display in the new STEM-Ag building where our department will be situated c. 2025. A fiberglass replica of *Appalachiosaurus*, which was produced in an agreement between the McWane Center and Triebold, can be purchased from Triebold Paleontology in Colorado (see their web page for details and pricing. It snaps together and sits on a metal frame. The skeletal assembly can be configured to fit into a smaller space than it occupies at McWane and Tellus, if that is a consideration in our new building.

This is the Triebold link to view and order the replica: https://www.trieboldpaleontology.com/dinosaurs/appalachiosaurus-montgomeriens

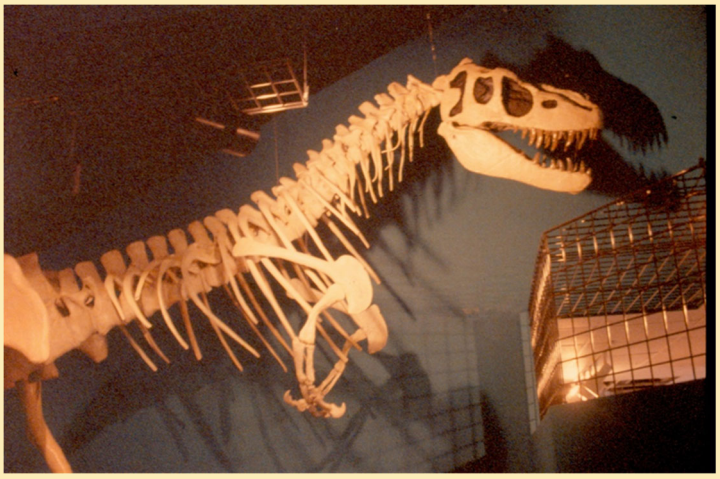
Below, I share some historical images of Auburn's dinosaur, which I hope the readers of this year's *Geotiger* will enjoy. If you can help us acquire the replica of this dinosaur, please contact me.

Excavation of *Appalachiosaurus* discovery site during August 1982. AU faculty members Dan Womochel (L) and Jim Dobie (center), and student Butch Anthony (R), dig at the bone-bearing level. Photo by me.

Plaster jacket is placed around a group of bones excavated during the August 1982 digging session shown in the image above. Photo by me.

Discovery of Appalachiosaurus – 40 Years Later

Red Mountain Museum-led excavation of larger quarry area at the discovery site, which was cut open by heavy equipment, c. 1986. Photo by James Lamb, U. West Alabama.



Original plaster replica reconstruction on display at Red Mountain Museum, c. 1995. Photo by me.

Some of the limb bones partially cleaned and still in the plaster jacket at Jim Dobie's laboratory, c. 1985. These bones were excavated by AU faculty and have AU museum numbers on them. They are presently housed at the McWane Center in Birmingham, along with many others from the AU collection. Photo by me.

Triebold Paleontology-produced fiberglass replica of *Appalachiosaurus* (in running mode) presently on display at the Tellus Museum in Cartersville, Georgia.

On the 40th anniversary of its discovery, *Appalachiosaurus*' skull replica returns to the place the original skull and other bones were found on Montgomery County Road 101. The original skull was crushed in the chalky marl, but was restored by the staff of the McWane Center, who then produced this skull replica. Photo by Jake Crandall of the *Montgomery Advertiser.*

Leading planetary scientist receives SEC travel award to study Meteorites

Julia Cartwright, an assistant professor in the Department of Geological Sciences at the University of Alabama, is the recipient of a 2022-2023 SEC Faculty Travelers award to conduct research on meteorites at Auburn University in collaboration with Bill Hames, a professor in the Department of Geosciences at Auburn University.

“As part of my research, I am interested in the timings of major events in the Solar System, and the compositions of the materials involved. Some meteorites represent materials that went through major planet-forming processes and have features akin to many of the rock types that we find on the Earth. Other meteorites represent some of the earliest phases to have condensed out of the Solar Nebula when the Solar System formed”, said Cartwright.

“While most of my research has been based on the Earth, I’ve always been interested in outer space. It is fascinating to think that some meteorites are part of the primordial nebular garden that gave rise to our Sun and planets, while others are potential fragments of ‘planetesimals’ that were destroyed by early collisions, now to abound within the asteroid belt. And rather than being cold and inactive for the past billions of years, these meteorites can collide within the asteroid belt, undergoing heating and melting, allowing us to study times of cataclysms in space when many asteroid collisions occurred” said Hames.

The SEC Faculty Travel Program encourages faculty to further work together among SEC member universities to allow new research or continue their projects and make a meaningful impact.

“I am thrilled to be working with Bill – we have been planning to work together for a while, and the funding from the SEC will really allow our project ideas to come to fruition!” said Cartwright.

“Julia is one of the world’s foremost authorities on noble gas cosmochemistry research,” said Hames. “With this funding from the SEC, she and her students are able to travel to Auburn to work with me to measure noble gases and mineral chemistry of various meteorites including chondrites, eucrites, howardites and mesosiderites.”

Cartwright and Hames will be conducting research on two key instruments housed in Auburn’s Department of Geosciences.

The Auburn Noble Isotope Mass Analysis Lab, or ANIMAL, combines mass spectrometry research and geochronology to help scientists unlock Earth’s history with radiometric age determinations. They will also use an electron-beam instrument for chemical analysis of these meteorites through the Auburn University Electron Microprobe Analyzer lab, or AU-EMPA.

“Both of these instruments have been generously provided, housed and cared for in the Beard Eaves Memorial Coliseum with support from the Department of Geosciences, the College of Sciences and Mathematics, AU Facilities and the AU Athletic Department,” explained Hames.

Cartwright and Hames plan to study the chemical composition of these meteorite samples as more focus on planetary exploration continues to grow.

“We are now starting to acquire materials from different localities in the Solar System, and the work that we are doing, to try to date these meteorite fragments, and to assess their compositions can help augment the framework of understanding for major Solar System processes,” said Cartwright.

"We also plan to write an external grant to help continue our research,” said Hames.

Water Resources Conference

One of the largest and most established venues for the state's water resources, the annual Alabama Water Resources Conference, or ALWRC, attracted a record-breaking number of attendees this year. More people attended sessions earlier this month at the Perdido Beach Resort in Orange Beach, Alabama, than at any time in the previous nearly 35 years. There were over 340 registered participants and over 320 active participants from at least 10 states. The yearly gathering is organized by the Auburn University Water Resources Center.
The ALWRC offers a forum for water experts and academics from the Southeast to connect and share cutting-edge research, initiatives, and outreach strategies. The conference includes keynote speakers who are regional and international experts in water resources, as well as presenters from a wide range of water resources research, management, policy, and outreach backgrounds.

An important event this year was the keynote discussion on Blackbelt infrastructure, which featured Lance LeFleur, director of the Alabama Department of Environmental Management, Sherry Bradley, director of the Alabama Department of Public Health's Bureau of Environmental Services, and Daniel Blackman, administrator of the Environmental Protection Agency's Region 4 office.

The Alabama Chapter of the American Water Resources Symposium marked the beginning of the three-day event. The theme of this year's keynote speeches was ecological infrastructure, and Michael Roberts, president of the Coastal Trust, and Judy Haner, director of marine programs for The Nature Conservancy of Alabama, were the presenters. Renee Collini, a coastal climate resilience specialist with the Mississippi-Alabama Sea Grant Consortium, Leslie Gahagan, the city of Foley's environmental director, and Jeff Collier, the mayor of the city, participated in a subsequent panel discussion on sea level adaptation.

Presenters were able to exchange information on new research, interagency programs, and funding opportunities throughout the course of two days of concurrent sessions. A record amount of material was shared at the conference thanks to the more than 120 speakers in concurrent sessions and 38 poster presenters.

The ALWRC, which was planned in collaboration with a multi-agency committee and the Alabama Chapter of the American Water Resources Association, offers opportunities for discussion about multidisciplinary aspects of water resources and connects stakeholders to improve understanding of complex water issues important to this state, the region, and the nation.

For their oral and poster presentations, a number of Auburn University students were recognized with prizes. The following were the student competition winners:

Oral Competition

First Place: Benjamin Webster, Auburn (Department of Crop, Soils and Environmental Sciences)

Second Place: Giacomo DeLuca II, University of South Alabama (School of Marine and Environmental Sciences)

Third Place: Anna Powell, Auburn (Department of Crop, Soils and Environmental Sciences)

Poster Competition

First Place: Danyal Aziz, University of Alabama (Department of Civil, Construction and Environmental Engineering)

Second Place: Kelly Kaye, Auburn (Department of Geosciences)

Third Place: Mehrzad Shahidzadehasadi, Auburn (Department of Biosystems Engineering)

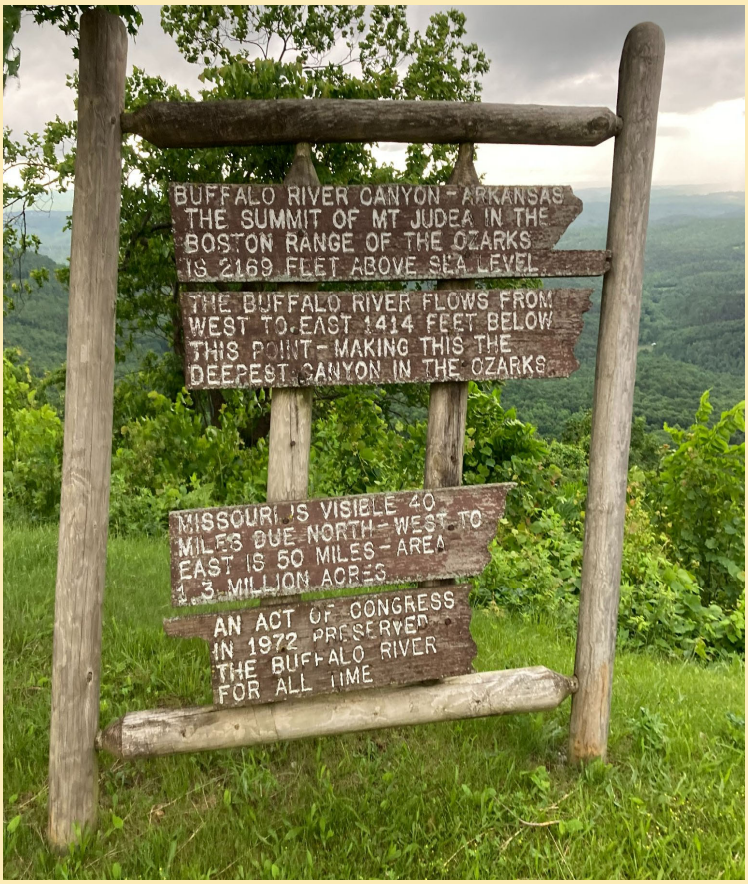
The mission of the Auburn University Water Resources Center is to facilitate interdisciplinary collaboration among Auburn faculty and staff on water-related research, outreach and instruction; conduct innovative research to find practical solutions for current and future water issues and empower private citizens to become active stewards of water resources.

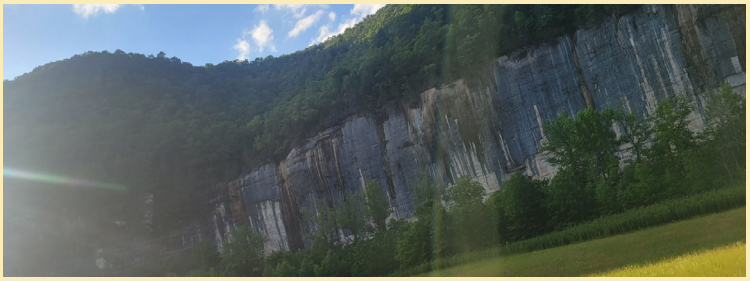
Catoma Creek and Point A Dam (SPEL Activities)

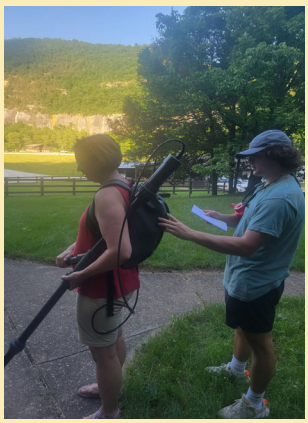
The fall 2022 Paleobiology class traveled to Catoma Creek in Montgomery to study and collect Cretaceous marine fossils. The students discovered many oysters, echinoids (sea urchins), ammonites, fossil wood, and a few shark teeth. In the picture with the flag, the participants are (left to right): John Fronimos, Caroline Locker, Chase Lucht, Freeman Fields, Matt Hill, Garrin Phelps, and Bryce Hall.

Auburn geology student Caroline Locker established a new student fossil club, the Society for Paleontological Exploration and Learning (SPEL). Drs. Leticia De Marchi and John Fronimos helped the club organize a field trip to Point A Dam in Covington County. Students learned how to screen wash sediments to find Eocene shark and sting ray teeth.

Field Work *by Stephanie Shepherd*







Ryan and Taryn (MS-Geology), Abrianna (USGS funded CAST REU), and Dr. Stephanie Shepherd travelled to the Buffalo National Scenic River to collect data and samples. They also set up and tested new instrumentation for tracking gravel movement with RFID tags.

Geoscience Students Exploring Western North Carolina

A group of Geosciences students spent the weekend of April 1-3 in western North Carolina exploring the geology of the southern Blue Ridge Mountains and searching for minerals such as garnet, olivine, and sillimanite near Chunky Gal Mountain, between the cities of Hayesville and Franklin.

Twenty-five years of research at Wetumpka impact crater, Elmore County: Part 1 (1997-1998)

David T. King, Jr.

Professor of Geology

Tony Neathery (1931-2015), formerly an assistant state geologist, was the first person to interpret large, the semi-circular topographic feature at Wetumpka as a possible impact crater. Tony's work was pioneering and went against previous interpretations that made Wetumpka impact crater out to be a depression on unknown origin (E. A. Smith's work of 1894) and an arcuate fault zone (G. W. Stose's work of 1926). Tony was not successful in finding definitive proof of impact, but he had put Wetumpka on the map of possible impact craters based on his 1969-1970 field studies and 1976 paper in the *Geological Society of America Bulletin*. For Tony, understanding Wetumpka impact crater was "unfinished business."

During 1997, Tony Neathery and I had the good fortune to spend some time together in the field at Wetumpka looking over key sites that he had found years before. Our being there had to do with planning for a conference field trip that was associated with the 1997 conference for the Southeastern Section of the Geological Society of America (SE-GSA), which was held in Auburn. It is quite common for geological conferences to include field trips to local areas, and this one was no exception. Joining us in this field trip effort was Dr. Lorraine Wolf, of our department, who was our geophysicist. In 1996, one of her students had used a gravimeter to measure the force of gravity at numerous points in a line across the crater from west to east (using mainly the right of way for the natural gas pipeline that crosses the whole crater). Her reduction of that gravity data, included in the guidebook for the 1997 SE-GSA field trip, showed a gravity profile of values that was consistent with the impact crater interpretation. Tony, Lorraine, and I compiled a field guidebook showing outcrops and maps, as well as the gravity interpretation.

The field trip was a great success. As I recall, about 30 people participated; some of them had come from great distances to be there particularly for the Wetumpka field trip. One was a well-known impact researcher, Dr. Christian Koeberl, who came from the University of Vienna to see the crater. During the field trip, I talked with Tony about joining together with him to seek funding for a core-drilling operation to seek proof of impact, if that could be found. Tony's original study, and my work thus far in 1997, did not reveal any impact-affected (or "shocked") mineral grains, which is one of the lines of evidence needed to prove impact origin of any crater feature. I reasoned that if we were to have a core drilled at depth, particularly at crater center where the shock pressures would be highest, that should give us the rock materials with the best chance of yielding evidence of high-pressure effect (shock effects). Also, the rock at depth should still contain trace amounts of certain key elements, like iridium, that would have been borne by the impacting asteroid.

Later on in 1997 (after the SE-GSA meeting was over), Tony was in touch with geologists at Vulcan Materials Company in Birmingham, and he obtained a verbal agreement that they would give in-kind support for a core-drilling operation at the crater. I prepared a proposal to Vulcan Materials and they agreed to fund a drilling operation for two bore holes near the crater's center. Vulcan sent a drilling crew of three people, which was led by Ms. Marsha Andrews. During drilling local news channels, CNN, and *Discovering Alabama* with Doug Jones visited the drill site and filmed stories. The *Discovering Alabama* filming resulted in the production of episode #29, which is still available for purchase and is a YouTube video (see https://www.youtube.com/watch?v=G1VhqrK79Ls).

Below are some images from about 25 years ago. In next year's *Geotiger*, I will continue this historical account starting with the discoveries made during the interval 1998-2002 that proved Wetumpka is an impact crater – the 157th known impact crater on Earth at that time.

Vulcan Materials drill rig at Mr. Schroeder's home in Wetumpka. Drilling to ~ 300 m occurred from June 24 to July 18, 1998. We now refer to this as A.U. Scientific Borehole #98-01. The drill core from this well was studied by Reuben C. Johnson for his M.S. thesis (2007); and by us for our 2002 *EPSL* paper.

Me and Tony Neathery taking a break during drilling at Mr. Schroeder's home (June 1998).

Wetumpka impact crater, Elmore County: Part 1 (1997-1998) Continued:

The "discovery box" of drill core, A.U. Scientific Borehole #98-01 ("Schroeder's well"), which is Box #23 (381.3 to 388.9 ft). The sample just above the yellow tag ("spl S-385.5") yielded the first grains of impact-affected (shocked) quartz ever found at Wetumpka. A sample from the breccia in the next-to-last slot yielded chemical traces of the impacting asteroid (namely Co, Cr, Ni, and Ir). Impact-affected quartz and cosmic chemical traces were found in other parts of the 1998 drill cores as well, but the discovery made in this core box signaled that we had found two strong lines of evidence that Wetumpka was a bona fide impact structure. Results were published in 2002 in *Earth and Planetary Science Letters*.

Picture on left:

Shocked quartz grain in thin section from sample S-385.5. Impact-generated shock lamellae are the thin, closely spaced, sets of dark lines that occur in several orientations within the quartz crystal. Field of view is about 300 microns across. Crossed-polars. From our *EPSL* 2002 paper.

News from Faculty

Laura Bilenker
Assistant Professor

Establishes research and educational partnership with the University of Puerto Rico thorough a $505K NSF award.

The National Science Foundation, or NSF, has awarded $505,000 to Tom Hudgins, an associate professor at the University of Puerto Rico, Mayagüez, and Laura Bilenker, an assistant professor in the Department of Geosciences, for their collaborative research project titled Characterizing Iron Deposits in Puerto Rico to Elucidate Metal Transport and Magnetite Mineralization Processes in Skarn Systems. The award is financed by the Established Program to Stimulate Competitive Research and the NSF's Petrologyand Geochemistry Program in the Division of Earth Sciences (EPSCoR).

The prize's duration is from August 2022 to July 2025. The $248,000 to Hudgins and $257,000 to Bilenker will increase our knowledge of the mineral resources accessible for renewable energy infrastructure while supporting research on Puerto Rico's iron deposits (skarns).

"We have created a sustained network between our two institutions," said Bilenker. "With funding from this award, 10 undergraduate and four graduate students in Puerto Rico and Alabama will be able to collaborate virtually monthly, conduct fieldwork in Puerto Rico and use instrumentation at Auburn University."

Researchers will have the chance to inspect, record and sample naturally occurring iron-rich ore in the Tibes, Keystone, and Island Queen deposits, which are spread out across the island of Pureto Rico.

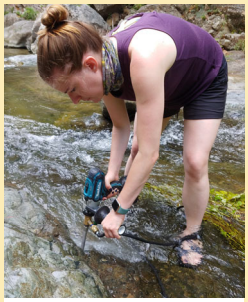
"These students will be able to gain valuable field experience in Puerto Rico and refine their research skills in a laboratory environment at Auburn," Bilenker added. "Following up with hands-on compositional analysis of the rocks they collected together, will help the students become independent scientists and prepare for rewarding career opportunities in geology."

Keystone iron deposit.

The project's scientific objective is to thoroughly characterize the ore deposits for a report that will be published. Field mapping, microscopic observations, magnetite trace element and stable isotope geochemistry, garnet trace element geochemistry, and geochronology are just a few of the many methods the researchers will employ.

"This multi-faceted approach allows us to tell the story of iron ore formation that has not been edited by other geological processes," she explained. "The ore deposits in Puerto Rico are relatively pristine and 'frozen in time' from when they actually formed."

The work also opens the doors for researchers to contribute to the future of renewable energy.



Tibes iron deposit

"After we describe and characterize these deposits, we can then look in other places that experienced a similar sequence of events to see if iron resources formed. This new information will help us increase our chance of finding more ore deposits," Bilenker said.

This could be a key factor for renewable energy efforts that rely on this metal.

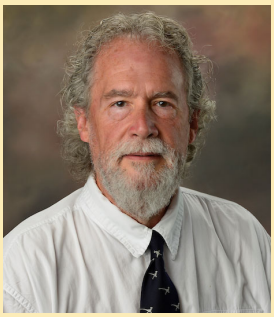
"Iron plays a critical role in the infrastructure of both solar and wind energy," she said. "Finding iron ore deposits like the skarns in Puerto Rico is necessary to support the world's transition to renewable energy." This honor is the fruition of Bilenker's desire to use her expertise in geochemistry to inspire the following generation of geoscientists.

Jesse Patrick performs iron analyses

Puerto Rico Team Island Queen iron

News from our Faculty

David King
Professor of Geology



During the past year, I continued research in two main areas – one basic and the other applied. In basic research, I worked on impact craters and planetary surface processes, and in applied research, I worked on projects related to disposal of carbon dioxide and of radioactive waste.

During 2022, I published a review of the work that my students and I have done in Belize over the past 25 years. The review included the first new chronostratigraphic analysis of the northern and southern basins of Belize since the 1950s. This paper is in the e-journal *Revista Maya de Geociencias*, and is available on line at:

https://revistamaya.com/wp-content/uploads/2022/03/Revista-Maya-Geociencias-MARZO-2022.pdf .

Presently, I teach several courses on a regular basis in our department including Dynamic Earth, Earth and Life through Time, Lunar and Planetary Geology, Stratigraphy, parts of two graduate courses (Facies Analysis and Sequence Stratigraphy and Cycles in Earth History), and a graduate course in Impact and Planetary Geology.

As I have been for many years, I am the advisor for the student groups, Sigma Gamma Epsilon and the Auburn chapter of the American Association of Petroleum Geologists. Also, I am the departmental coordinator for the Science Olympiad on campus each year. I have returned to the Alabama Board of Licensure for Professional Geologists as the member representing of academic departments of geology in our state.

July 2, this year, was the 40th anniversary of my discovery of the type specimen of the small tyrannosaur named *Appalachiosaurus montgomeriensis*. This specimen from Montgomery County is also known as "Auburn's dinosaur" and I have been calling him or her "Appy." The Montgomery Advertiser featured a story about Appy (including pictures and video) on the anniversary of its discovery, which is posted at this link:

https://www.montgomeryadvertiser.com/story/news/2022/06/29/appalachiousaurs-alabama-discovery-1982-recalled-by-auburn-professor/7636101001/ .

A lot more about *Appalachiosaurus* is presented in my book, *Alabama Dinosaurs* (4th ed., 2022), which is published by Sentia Press of Austin, Texas, and is sold by Amazon.com.

This year, I was chosen as a Fellow of the Geological Society of America. I have wanted to be a Fellow of the GSA for many years, and I am very grateful to my colleagues who supported my nomination for this important honor.

I would really enjoy hearing from former students. I have the same email address as I did when email first came to Auburn – kingdat @ auburn.edu. Would really like to know about your career and your recollections of Auburn geology back in the day.

Richard Vachula
Assistant Professor

I joined the Department of Geosciences in January 2022 as an Assistant Professor. I moved here from Virginia, where I was teaching and doing research at the College of William and Mary as a postdoctoral fellow. Before that, I had a short postdoc in the UK at the University of Reading. I completed my PhD and MSc at Brown University.

I am a paleoecologist and organic geochemist researching how fires and humans have affected ecosystems of the past to inform management and policy decisions today. I study the variability, controls, and impacts of fire in the Earth System, as well as the ecological impacts of humans on ecosystems. A major component of this research involves understanding climate variability and change, and what this means for terrestrial ecosystems and humans alike.

Auburn has been great so far and it has been wonderful to join such a welcoming community. It has been fun to work with students in the classroom and lab, and I have a several budding collaborations with faculty in the department that have exciting potential for the future. When not working, I enjoy reading, writing, hiking, and watching old movies.

Continuing Faculty Members

Brain Boston
Assistant Professor

I joined the Department of Geosciences in August 2022 as a new Assistant Professor, where I'll be teaching geophysics and continuing my work using marine geophysical methods, especially controlled-source seismology, to study the large-scale tectonic processes that shape the Earth's crust and upper mantle. Before coming to Auburn, my research interests have taken me around the world, both at sea on research expeditions, and on land at different institutions.

I started out at the University of Hawai'i at Mānoa for my PhD, then moved to the Japan Agency for Marine-Earth Science and Technology (JAMSTEC) in Yokohama, Japan, and finally, spent three years in New York at the Lamont-Doherty Earth Observatory of Columbia University. My research had taken me to sea for months collecting new and exciting datasets that allow us to see the unseen beneath the ocean floor.

Most recently in Summer 2022 off the Pacific coast of Mexico, we investigated the Guerrero seismic gap, a "quiet" area along the Middle American Trench that has not experienced any large coseismic earthquakes in the last 100 years. I'm originally from Chattanooga, TN, so coming to Auburn is like coming home for me. My wife and I are particularly happy to be within driving distance of family for the holidays for the first time, and our cat, who's always lived in city apartments, is loving watching birds and other backyard wildlife from the windows of our house. War Eagle!

Jake Nelson
Assistant Professor

Through the Alabama Water Resources Research Institute, or AWRRI, the United States Geological Survey has awarded Nelson a $22,652.50 grant that will last through August 2023.

Private well owners are in charge of keeping an eye on potential contamination because private wells are not subject to EPA, state, or local government regulation. The presence of bacteria or other diseases in their water source is frequently unknown to them, according to Nelson.

He is collaborating with Ann Ojeda and Stephanie Rogers, both from the Department of Geosciences.

This initiative "will identify which specific geographic locations might be at increased risk for contamination by employing geodata science methodologies and geographic information systems, or GIS," he said.

Additionally, recognizing dangers to socially vulnerable populations is a key focus of the research.

The risk to historically underrepresented groups, who might not have the resources to remedy contaminated wells, can be reduced by identifying vulnerable populations, Nelson continued.

He wants to develop a contamination risk model for everyone in the neighborhood. It will examine well-owner communities in detail and offer previously unavailable information on the number of well owners in a region, where they are situated, and who they are.

According to Nelson, "this project will assist establish a baseline for expanding into a bigger effort." "We anticipate enhancing the effectiveness of private well sampling initiatives and raising awareness of the resources made available by private wells.

News from Faculty

Stephanie Rogers
Assistant Professor

A year in review from the GeoIDEA Lab

In 2022, the GeoIDEA lab graduated its first students; **Kaj Overturf**, **Stephen Todd**, and **Mallory Jordan** all successfully completed their Master of Science in Geography (MS GEOG) degrees. Kaj moved back to Maine and is an Environmental Science Technician at Haley Ward and notably has recently published one of his thesis chapters in *Ecological Indicators*, entitled "Winter weather predicts honey bee colony loss at the national scale". Stephen has moved to Birmingham and is working as a Geospatial Technician. Mallory has commenced a PhD in the Earth Systems Science (ESS) program and has won the prestigious *Presidential Graduate Research Fellowship* that will support her research for the next three years. New students in the lab include **Bethany Foust**, **Kelly Kaye**, and **Dinesh Neupane** who are all enrolled in the MS GEOG program. **Dr. Edna Fernandez-Figueroa,** postdoctoral fellow, continues to provide support and guidance to students while working on cutting-edge research using drones for water quality. In the last year, Edna and I developed a new course entitled "Drones and Geospatial Applications" which was successfully taught in SP 2022; it was well-received by students and will be offered every other year.

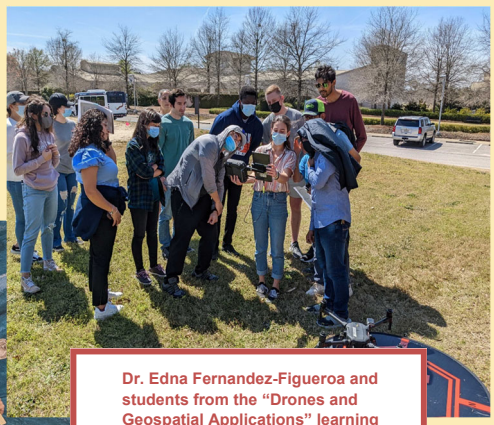
In addition to graduate student mentoring and teaching, I am keeping busy with several active water-quality related grants through the Alabama Agricultural Experiment Station (AAES), the Alabama Center of Excellence (ALCoE) with **Dr. Ann Ojeda** et al., and the Alabama Water Resources Research Institute (AWRRI) with Dr. Ojeda and **Dr. Jake Nelson**. In each, we develop new strategies for data collection and analysis at local and regional scales to gain a better understanding about how water related contaminants move across space and time. Additionally, collaborative efforts geared towards using geospatial approaches for understanding honey bee colony loss across the U.S. are beginning to come to fruition through publications (*Scientific Reports*) and web maps with **Dr. Geoff Williams** (Entomology and Plant Pathology, College of Ag), and an upcoming NSF-funded project with **Dr. Michael Smith** (Biological Sciences).

On a personal note, my daughter Ruby is tearing through her second year of life. At nearly 15-months old, her favorite things include cheese, bananas, being outside, chasing her dog Arthur, and tackling squishmallows.

Dr. Rogers and students Bethany Foust, Mallory Jordan, and Kelly Kaye at the Alabama Water Resources Conf. (Sept 22)

Dr. Stephanie Shepherd
Associate Professor

Dr. Stephanie Shepherd's daughter, Isobel, received her "wish" form Make-a-Wish Alabama in the spring. Isobel was born with CDD (CDKL5 Deficiency Disorder), a genetic condition that impacts brain development and function. The whole family from grandkids to grandparents love to go camping, now Isobel can join in the fun with a travel trailer. Also Dr. Shepherd was tenured and promoted to associate professor and is incredibly excited for her new role as the co-director of AUTeach. AUTeach is a collaboration between the College of Science and Mathematics and the College of Education that will train new K12 science teachers, addressing the critical science teacher shortage in the state of Alabama.



Dr. Edna Fernandez-Figueroa and students from the "Drones and Geospatial Applications" learning how to fly a drone outside of the Jule

News from Staff

Anthony G. (Tony) Hall

Laboratory Teaching Manager

The year has become more normal than the past few years. Students are in the buildings; and faculty and staff are back in their offices. The new for this year in the department was the opening of the ACLC building (A new facility for our introductory labs and labs requiring microscopes.)

On the home front, I continue to photograph for the Atlanta Motor Speedway during their NASCAR events. Additionally, I was given the opportunity to travel to Ukraine to spend time with children that were displaced from their home during the recent bombings of their country. While there, we were able to take the kids on tours of castle, to play in the water parks, and even got to go to a dinosaur park. Some of the older kids went on a picnic where they got to swim in a lake, they went downhill tubing and toured an underground World War II bunker.

Every evening, we were able to play with the younger kids and we gave them all ice cream.

Coming late in the year, I have a new addition in my house. Her name is Amanda. She is a 6 ¾ years old black lab. She is a retired explosive detection dog that I adopted from the Canine Performance Services on campus.

I continue to work on my coursework for the Earth System Science PhD program.

God Bless, stay safe, and War Eagle!!

Tony

Kiley Coan

Administrative Support Associate

This year has flown by and it hasn't stopped yet. I continue assisting the students with registration, assist with travel reimbursements, maintain work orders/office supplies, assist with evaluations, and assist with daily office operations in the Geography Department. I also enjoy putting together our Departmental newsletter (eGeotiger). We have finally made it back to in-person operations and it has been great seeing everyone in person once again!

On a personal note, I am very proud of my two girls. Kamryn made the all A' honor roll (9th grade) at Auburn Junior High school and will be heading to Auburn High school next year. She plans to attend Auburn University upon graduation.

Kaylee continues to play travel soccer on the Auburn Thunder team and has really improved over the years. Kaylee is also an amazing artist and has a love for animals.

We added a new family member, our German Shepherd, Rosy. She is a handful.

This year we took a trip to Walt Disney World for our family vacation in March, 2022. Our favorite ride was the Flight of Passage at the Animal Kingdom.

Departmental Gatherings

The Departmental Annual Christmas party was a big hit. The staff was recognized for their hard work and dedication. Everyone brought their favorite dish and shared as we voted on the ugly sweater contest.

Miranda Silano and Tyler Smith were the winners in this year's contest.

Professor Stephanie Shepherd and her daughter Isobel join in the fun.

Ugly Sweater Finalists (Pictured Left to Right) Ann Ojeda, Ashleigh Rudd, Sara Speetjens, Tyler Smith, Miranda Silano and Steph Shepherd.

Tyler Smith and Miranda Silano for the win!

Tea Time with the Grad Students

Departmental Awards

The Department of Geosciences hosted this year's Spring Picnic Awards on Saturday, April 23, 2022 at Auburn's North Pavilion. We would like to honor all of the accomplishments made by our exceptional students in the academic year 2021–2022.
Donations are used in a variety of ways to assist our students and our activities, thanks to gifts from our alumni and other friends of the department. Scholarships and other honors, such as plaques and cash, are one way to honor students who stand out in their fields of study, research, service, and/or leadership.
We have built very well organized nomination, application, and voting methods to ensure the success of our departmental Awards Committee (Co-Chairs Phil Chaney and David King, as well as committee members Chandana Mitra and Chuck Savrda), thanks to their tireless labor.

Student Awards 2021-2022

Outside of the University

IBA team for 2022 -

Andrew Lipscomb — Bishop Robbins
Mahir Tajwar — Ozan Sinoplu

COSAM Awards

Dean's Medalist (Outstanding Senior) for Geosciences
Emma Henderson

Outstanding Junior in Geosciences-
Evan Trueb

Research for MS
Brandon Ryan

Department of Geosciences Awards

The Endowed Dr. Charles E. "Chuck" Savrda Outstanding Graduate Student Award- I. Dogancan Yasar

Robert S. Fousek
Award for Research in Economic Geology
Jessica Patrick — Elyssa Rivera

Presidential Graduate Fellowships

Mallory Jordan — Shifat Monami

Steltenpohl Award

Chase Lucht

Hargett-Dunston Awards

Josh Lombardo

ABM Outstanding Student and Mentor

Bishop Robbins — Haibo Zou

Outstanding Leadership Award

Sara Speetjens

Stephen Todd

Maye Mayes

GAB Outstanding Student Awards

Undergrad — Emma Henderson
MS — Laura Talkington
ESS PhD — Stephanie Courtney

GAB Research Awards

Ryan Brooks — Jenna Brown
Taryn Hicks — Elijah Johnson
Haylie Mikulak — Shirat J Monami
Jessica Patrick — Megha Shrestha
Ozan Sinoplu — Tyler Smith
Md Riaz Uddin — I. Dogancan Yasar

GAB Travel Grants

Fall 2021	Spring 2022
Kaj Overturf	Haven Cashwell
I. Dogancan Yasar	Sukanya Dasgupta
Cisil Bengisu Badur	Eleanore Larson
Marisa Barefoot	
Hayden Malloch	
Md Sharif Mustaque	
Elyssa Jordyn Rivera	
Tyler Smith	
Mahir Tajwar	
Stephen Todd	
Megha Shrestha	
Sukanya Dasgupta	
Mallory Jordan	

GAB Freshmen Scholarships

Jeremiah Battaglia — Lilly Miller
Nathan Deese — Asher Staubach

Geology Alumni Scholarships

Zain Webb — Bryce Hall
Caroline Locker — Jeremiah Battaglia
Nathan Deese — Blake Ostrander
Garrin Phelps — Asher Staubach

Spring 2022 Picnic

GAB Advisory Committee presented awards to our award recipients at our annual Spring Picnic Awards Ceremony 2022. The t-shirts provided were designed and made by Ashleigh Rudd.

Outstanding Leadership Award

Mayes Mayes, Stephen Todd, Sara Speetjens

Awards and Recognitions

Robert Fousek Award

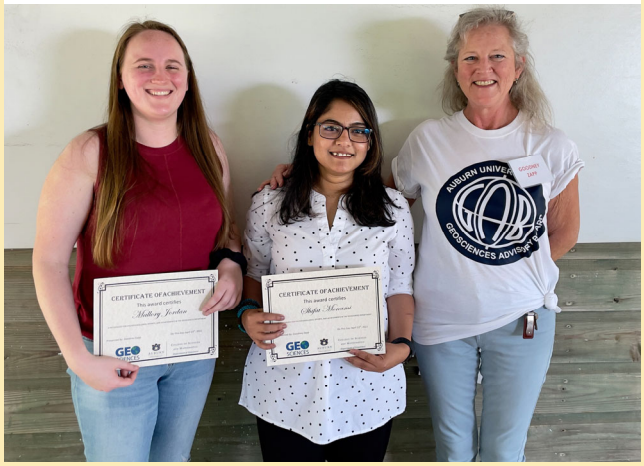
Elyssa Rivera and Jessica Patrick

"Chuck" Savrda Outstanding Graduate Student

Dogancan Yasar

Presidential Graduate Fellowships:

Mallory Jordan and Shifat Monami



Outstanding Student Award:

Emma Henderson, Laura Talkington, and Stephanie Courtney

Outstanding Leadership Award:

Maye Mayes, Stephen Todd and Sara Speetjens

GAB Travel Award:

Eleanore Larson

Awards and Recognitions

GAB Research Awards *Kaj Overturf, Elyssa Rivera, Tyler Smith, Stephen Todd, Mallory Jordan, Dogancan Yasar, Mahir Tajwar*

IBA team 2022

Mahir Tajwar, Ozan Sinoplu, Bishop Robbins

ABM Outstanding Student and Mentor

Bishop Robbins, Haibo Zou

Dean's Medalist (Outstanding Senior)

Emma Henderson

Awards and Recognitions

Emma Henderson – *2022 Dean's Medal (Geosciences)*

Emma Henderson will receive her Bachelor of Science in Geology in summa cum laude. Emma started her undergraduate journey at Northwest-Shoals Community College, where she received an Associates in Science degree upon completion of her studies. In the spring of 2021, she was noted as an outstanding transfer student after transferring to Auburn University as a junior.

Emma has examined bacterial communities in Parkerson Mill Creek in Auburn as an undergraduate researcher working under Ann Ojeda in the Auburn Contaminants Lab. Her most recent endeavor, an undergraduate research fellowship, involved keeping an eye on how a storm's first flush affected the microbial community and nutrient cycling in Parkerson Mill Creek. Emma participates as a student member of the Geo Club at Auburn. She enjoys visiting her hometown of Mt. Hope, Alabama, every other month to help with the outreach programs, and she volunteers at the food bank of her home church when she is off campus. Emma likes to spend her free time outside, reading, and cooking for her loved ones.

Emma is grateful for the possibilities, connections, and experiences Auburn University has so far provided for her.

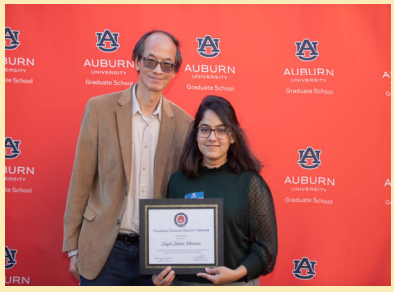
Emma will continue her studies with Ojeda by pursuing a Master of Science degree at Auburn University once she graduates.

Mallory Jordan *Presidential Fellowship*

Mallory Jordan, a first-year PhD candidate in Dr. Stephanie Rogers' GeoIDEA lab, has just been given the coveted Presidential Graduate Research Fellowship, which is financed by the Graduate School, COSAM Dean's Office, and Auburn University's Presidential Office. The three-year fellowship will support Mallory's research, which uses cutting-edge geospatial techniques and ideas to improve our comprehension of water quality challenges in Alabama and the southeastern United States. Mallory is a model student and researcher whose contributions to science will have a significant influence.

Shifat Monami *Presidential Fellowship*

Shifat Monami, a PhD student in Dr. Ming-Kuo Lee and Dr. Ann Ojeda's lab, received Auburn's Presidential Graduate Research Fellowship. The fellowships are offered annually to top-tier graduate students who pursue doctoral degrees in emerging areas of national importance. This prestigious fellowship will support Shift's doctoral research on geochemistry and bioremediation of groundwater contaminated by coal combustion residuals (CCRs). Shifat's research is also funded by the Electric Power Research Institute (EPRI). Shifat has brought exemplary levels of scholarship and research innovation to the Geosciences Department.



Awards and Recognitions

Ten graduate students participated in the 2022 Three Minute-Thesis Competition, or 3MT, finals at Auburn University on November 8 in the Melton Student Center Ballroom, which was organized by the Graduate School and the Graduate Student Council.

Miranda Silano (Department of Geosciences) and Ishveen Kaur (Biology) were two of the ten finalists who represented the College of Sciences and Mathematics.
A group of judges made decisions regarding the competition's overall winner and runner–up, while the audience selected the recipient of the People's Choice Award. The winner of the People's Choice Award, Silano, who got 250 in prize money, received the most votes.

The Calm Before the Storm: Monitoring Tropical Cyclone Risk and Vulnerability in the Gulf of Mexico was the title of Silano's 3MT presentation. It centered on the idea that calculating risk and figuring out where you are most vulnera-ble can help you save money and lives, which can help us understand how tropical cyclones effect civiliza-tion. Chandana Mitra is Silano's advisor as she pursues a master's in geography while she is a trainee in Auburn's NRT Climate Resilience Program. Her study focuses on how medium-sized cities near the Gulf of Mexico can be resilient to climate hazards.

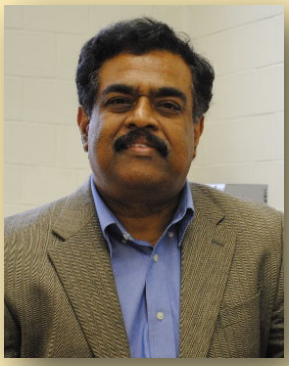
The 3MT technique, according to Silano, allowed her to be her own "director" and "script writer," and she rel-ished the challenge of having to condense two years' worth of work into three minutes or less.
I really enjoyed being able to speak to the emotional side of the audience who may or may not have been familiar with the topic by presenting my findings in a narrative fashion, she added. Silano claimed that taking part in 3MT had given her more confidence in her capacity to successfully explain complex find-ings to a varied audience.

"I learned that scientists have the responsibility to communicate our research to audiences in a digesti-ble format, like the one the 3MT requires, so that everyone can be aware of how our research can benefit them," she said.

Ishveen Kaur and Miranda Silano

Faculty Awards

COSAM Service-Outreach Award



Dr. Uddin Ashraf received the 2022 COSAM Service-Outreach Award. Geoscience's graduate enrollment and GTA positions have more than doubled since Ashraf served as the Departmental GPO in 2007. Ashraf also initiated Geosciences' Imperial Barrel Award (IBA) Program about 10 years ago, under his leadership, the program now has grown, is well established, and has become well connected to many Geosciences alumni and partners in the oil and gas industry.

The Faculty Service/Outreach Award represents a well-deserved honor for Ashraf's remarkable efforts that translate directly to further growing and enhancing the research, instructional, service, and outreach value of our graduate programs.

2022 IBA Team

2022 SEC Faculty Achievement Award Winner

For Karen McNeal, it just means more.

McNeal, the William P. Molette Endowed Professor in the Department of Geosciences, is a 2022 SEC Faculty Achievement Award Winner.

One of just 14 people, McNeal represents Auburn University for her outstanding work and impactful contributions to the university.

"I am proud to represent Auburn University as the 2022 SEC Faculty Achievement Award Winner," McNeal said. "It is an amazing honor to be recognized and to see the difference we are making by helping to create a more climate resilient future."

McNeal, who is been awarded more than $25 million in research grants, is the primary investigator for Auburn's very first grant from the National Science Foundation's Division of Graduate Education's NRT Program that focuses on training the next generation of scientists focused on climate resiliency.

This highly competitive $3 million award gives her the opportunity to lead an exceptional interdisciplinary team within the Colleges of Sciences and Mathematics, Agriculture and Forestry and Wildlife Sciences.

McNeal, who joined Auburn in 2016, embodies the land-grant mission of the university. Her grants have not only impacted research and shaped the future for graduate students, but have given back to the community through meaningful educational outreach.

"It really does mean more when your work can help make a difference to future generations," McNeal said. "We are increasing the awareness of the changes to our climate that ultimately impacts everyone. The research that our team is working on aims to improve how people in the state of Alabama understand and respond to changes in our environment."

The SEC Faculty Achievement Award is given to faculty for excellence in an array of areas including focusing on teaching at the undergraduate level and their record of research.

"The proliferation of data in Earth and environmental Sciences has created challenges and exciting opportunities for subject matter experts to learn, communicate, and educate. Dr. McNeal's work makes scientific data understandable and meaningful to students, teachers, policy makers, and the general public," said Ming-Kuo Lee, chair of the Department of Geosciences. "The SEC Faculty Achievement Award represents a well-deserved honor for Dr. McNeal for her remarkable achievements in establishing a nationally known geosciences education research program at Auburn."

For McNeal, this award showcases how faculty can make a difference in the lives of students, while enhancing the level of research and positively impacting the local community.

*Karen also received the **Transformation Award***

"This national award is given to 'individuals who have made significant contributions to the development and capacity for geoscience education research' and Karen has been a leader in advancing this field," said Ming-Kuo Lee, chair of the Department of Geosciences.

In addition to being highlighted on the NAGT website and invited to a special luncheon at the Geological Society of America, she also be given a complimentary membership to the group.

News from Alumni

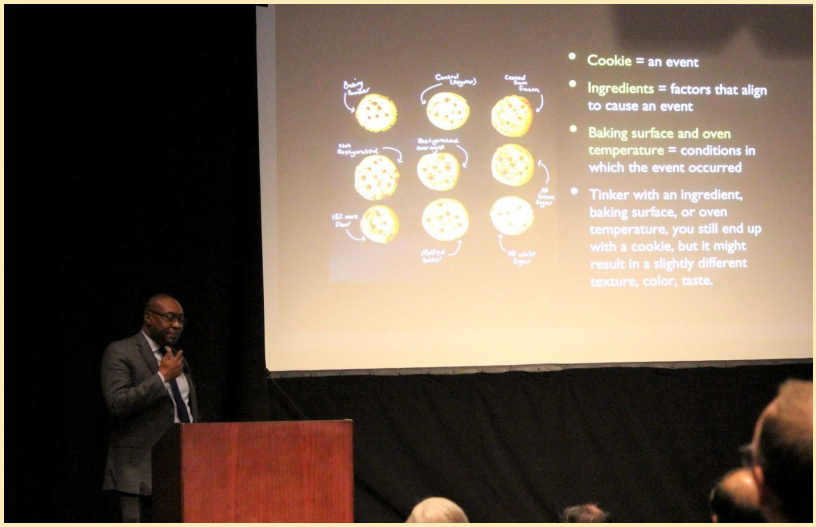
Amanda Savrda
Southeastern Section and Alabama State winner

Amanda Savrda teaches Earth and Environmental Science at Auburn High School in Auburn, Alabama. After earning her B.S. in Geology from Auburn University in 2008, Amanda obtained her M.S. in Geological Sciences from the University of South Carolina, where she was a USC Partner's in Inquiry Teaching Fellow at Crayton Middle School in Columbia, SC. As a team member of the United States Antarctic Program Special Project G-432-E, Amanda's M.S. research focused on the thermotactic history of rocks of Palmer Land, Antarctic Peninsula. Following graduate school, Amanda spent 5 years working in the oil and gas industry as a Senior Geoscientist in ExxonMobil's Exploration Company in Houston, Texas. In 2016, Amanda returned to Auburn to pursue her M.Ed. in General Science Education as a graduate research assistant in AU College of Education's Department of Curriculum and Teaching, supported by NSF's NanoBio Math Science Partnership. Following completion of her M.Ed. in 2017, Amanda served AU's Department of Geosciences as an Introductory Geology instructor for a semester. Amanda has since taught 10th, 11th, and 12th graders at Auburn High School while earning both her National Geographic Educator Certification in 2019 and a NISE National Certificate for STEM Teaching in 2022.

Amanda leverages her passion for STEM and experiences in both research and industry to help students connect their everyday lives to science content in the classroom. As students learn about the materials that make up our planet, the processes that shape it, the changes it has experienced throughout its history, and the role of humans in shaping our environment, Amanda strives to "make the world the classroom" for her students. In Earth Science, students use NOAA publications to explore relationships between global phenomena such as the Southern Oscillation and tornado frequency in Alabama. In Environmental Science, students use ArcGIS to understand how epidemiologists map epidemics such as cholera or pandemics such as COVID-19. Amanda's lessons are rife with real-world applications and connections and involve active research, interpretation of real-world and real-time data, and exploration and analysis of the relationships between local, regional, and global phenomena. When it comes to science content, Amanda's goal is to help the students answer the infamous question: "So what?!" Her contagious passion and enthusiasm inspires curiosity in her students and empowers them to see beyond "what" they are learning to "how" and "why" what they are learning matters to them personally.

Over the past 15 years, Amanda has participated in K-12 science outreach as a science camp counselor, boy scout geology merit badge instructor, geology guest speaker, STEM outreach instructor, and geosciences career representative for middle school and high school students in Alabama and South Carolina. While an undergraduate, Amanda was a charter member of AU's Chapter of the Association for Women in Science and maintains a vested interest in supporting women and underrepresented minorities in the geosciences. Amanda has been an active member of Auburn University's Department of Geosciences Advisory Board since 2015, helping to support the next generation of geoscientists through academic scholarships and career assistance.

Guest Speaker: Dr. James Marshall Shepard's Talk: "Extreme Weather and Climate Change: What's the Connection"



On Dec 5th, 20, the Geoscience Department and the NSF Research Traineeship (NRT) Program had the distinct honor of welcoming the Georgia Athletic Association Distinguished Professor of Geography and Atmospheric Sciences at the University of Georgia and past President of American Meteorological Society (AMS), Dr. James Marshall Shepherd to Auburn to speak on the Connection to Climate Change & Extreme Weather. The talk held at the Hotel of Auburn University and Dixie Conference Center.was open to all students and community interest in learning more about climate research. Dr. Shepherd's talk was in efforts to make the complex and polarizing subject of climate change more understandable and important to all. Dr. Shepherd, a repeat TED talk presenter, was an energizing speaker which led to an insightful Q&A session by many of Auburn's graduate students including Trainees from Auburn's NRT Program on Climate Resilience.

A Minor in Geography

A MINOR IN GEOGRAPHY

Geography studies the connections among people, places, and environments. Our geography minor gives students a sound foundation in geography as a research-oriented and policy-related field of study. The minor also offers students the opportunity to acquire a variety of techniques and skills necessary to understand the spatial dimension of human changes in the physical earth, and to identify and analyze urban problems.

Geography as a discipline prepares students for a wide variety of employment opportunities in the public and private sectors, including careers in the fields of planning, transportation, real estate development, publishing, marketing, and resource management.

MINOR REQUIREMENTS

Required Courses (6 hour total):

GEOG 1010 Global Geography
GEOG 2010 Human Geography
GEOG 2020 Physical Geography

MINOR REQUIREMENTS CONT.

Elective Courses (9 hours total):

GEOG 3000 Sports Geography
GEOG 3110 United States and Canada
GEOG 3103 Alabama and the Southeast
GEOG 3130 Latin America
GEOG 3140 Africa
GEOG 3300 International Travel and Tourism
GEOG 3810 Cartography and Graphics
GEOG 5010 Urban Geography and Sustainability
GEOG 5210 Climatology
GEOG 5220 Geomorphology
GEOG 5350 Economic Geography
GEOG 5380 Political Geography
GEOG 5400 Geography of Natural Hazards
GEOG 5510 Human-Environment Interaction
GEOG 5550 Geography of Water Resources
GEOG 5820 Ariel Photography and Remote Sensing
GEOG 5830 Geographic Information Systems

Students must earn a "C" or better in all minor courses

Invest in the Geosciences at Auburn!

State funds and tuition pay only a small part of the costs to recruit and retain the best faculty and graduate students and support the undergraduate programs that are the hallmarks of the Auburn experience. Private funds sustain and enhance these extraordinary opportunities for students and faculty. The Department of Geosciences continues to provide the best possible education for our undergraduate and graduate students. Each year, private support provides the funding that helps support Auburn's margin of excellence. With our new Ph.D. program in Earth System Science, private giving is now more critical than ever. Please make your gift today via our secure website:
http://www.auburn.edu/cosam/departments/geosciences/Giving%20to%20the%20Department/index.htm

We continue to welcome your gifts to any fund in the Department of Geosciences, and we hope you will consider any of the following funding priorities:

Geosciences Department: This unrestricted account provides the Chair with the most flexibility to apply support to the Department's most immediate needs, such as student and faculty travel, research, and equipment.

Geosciences Advisory Board: Our Advisory Board includes alumni, corporate, governmental, and community members who help support students, faculty, and staff in our department. The Board serves as a liaison with the geoscience business community and government entities to promote the interests of our department within Auburn University, the state, and beyond. The Board helps in our recruiting and retaining the most talented, motivated, and competent students and faculty by providing scholarships, grants-in-aids for research, CO-OPs, and internships, as well as support for our departmental seminar series and the GeoClub.

Geology Alumni Endowed Scholarship: Provides scholarships for deserving undergraduate students in geology.

Nick Hood Memorial Scholarship: The Nicholas L. Hood Endowed Memorial Scholarship was established by family, friends and classmates in memory of Nicholas L. Hood for the purpose of providing scholarships for students in the College of Sciences and Mathematics with a declared major in Geology.

For questions about creating scholarships and professorships, stock or estate gifts, specific programs, and suggestions on how you can support the Department of Geosciences, please contact COSAM development at the address below:

College of Sciences and Mathematics
Ashley Underwood

ashley.underwood@auburn.edu
(334) 844-2931

Editor: Kiley Coan rainskl@auburn.edu

Ashleigh Rudd, apr0022@auburn.edu

Department of Geosciences
Auburn University
2047 Beard Eaves Coliseum
Auburn, AL 36849-5305

Phone #: 334-844-4282
Website:

https://www.auburn.edu/cosam/departments/geosciences/giving_to_the_department/index.htm