

GEOFORCE MONTHLY

Changing lives since 2005



Photo: Bryce Canyon by Tyson McKinney

GEOFORCE 2023: SUMMER ACADEMIES

Summer 2023 was one of the hottest on record—with temperatures consistently over 100 degrees in Texas and Arizona. We did our best to keep cool, while teaching *cool* science to our awesome students. Over 500 GeoFORCE students participated in our summer academies and made this summer a resounding success.

Adjustments to the GeoFORCE academies ensure our students get the most out of their week. We introduced a new structure for our 9th grade academy, which now focuses on the “Life of a Sediment”. On this academy, students learned about the rock cycle and the processes acting on a rock—but taught as a story. We began on Enchanted Rock where we saw an example of igneous rock. We looked at the run-off streams at the base of the rock and saw how sediments are transported. Next, we headed over to Inks Lake where we checked out some of the only metamorphic rocks in Texas. Lastly, we went to Longhorn Cavern, where we saw stunning examples of sedimentary rocks that have been eroded away by water. Students gained firsthand knowledge of how processes acting on the different types of rock can cause change. Mid-way through the week, we “followed a sediment” down the rivers from Austin to Corpus Christi. While at the coast, we shifted our focus to coastal processes while still tying in the role a sediment plays in the system.

10th grade academies trialed Bryce Canyon National Park and hiked the Navajo Trail Loop. It served as an additional lens into the Grand Staircase; a series of colorful sedimentary rock layers that extends 100 miles from Bryce Canyon to the Grand Canyon (which we visited later in the week!) Bryce also gives us an incredible example of how rain and ice affects a landscape, turning it into something that looks almost otherworldly. Additionally, they got to navigate Lowell Observatory after dark and learn about the instruments that discovered Pluto.

The 11th grade academies also trialed new stops. Mt. Rainier was added to provide an additional visit to a volcano in the Cascade Volcanic Arc, a string of volcanoes running from Canada down through Northern California. The goal of the 11th grade academy is to show geology on an active margin; a zone located at convergent plate boundaries, where one plate is being subducted under another. We stop at several of the volcanoes located on the arc, including Mt. St. Helens, Mt. Hood, and Crater Lake. Students also paid a visit to the Oregon Museum of Science and Industry and the Hatfield Marine Science Center which introduced our students to the concept of engineering their own ROVs and the ecology of tide pools.



Dr. Jamie Austin's research group preparing equipment for data collection

12TH GRADE RESEARCH ACADEMY

The biggest revision this summer came with the 12th grade academies. This year we gave students the opportunity to do real research. We had students rank their interests and matched the students with researchers. Over the course of the week, students participated in data collection and analysis. They worked in small teams to produce a scientific research poster by the end of the week.

The first of the groups was led by UTIG research scientist Dr. Jamie Austin. Aided by Dan Duncan and Marcy Davis, these groups went out on a boat on Lake Travis. While on the water, they observed the pollution and microplastic presence by sampling sediment and using sonar devices.

The next groups were led by Dr. Sue Hovorka and the Gulf Coast Carbon Center (GCCC) team. Their research was centered around carbon capture and geologic storage, which is a tool used to combat climate change. The students learned about this important technique and were taught how to apply it to real problems and opportunities in Texas. They learned the geoscience techniques for injecting captured CO₂ into the deep subsurface where it will be permanently trapped.

Dr. Benjamin Keisling led lab-based group which worked on research focusing on how ice sheets and glaciers respond to climate change. They also looked at how sea level rise impacts the state of Texas. Students gained basic skills in coding and making maps. They also learned about computer science, numerical modeling, and GIS in geosciences.

GEOFORCE LONGHORN

Calling all UT GeoFORCE alumni!

First meeting of the semester
will be Wednesday,
August 30th at 5:30 PM
Meeting in the Jackson
School of Geosciences

**Come meet up with your
GeoFORCE peers!**

Dr. Tim Goudge's group traveled to the Texas Coast to study two specific beaches. They spent time on Sargent Beach, collecting data on the erosion of the beach. They also visited Bryan Beach to assess the advancement of the beach. They monitored the two beaches by collecting topography data (elevation) using unmanned aerial vehicles (UAVs) to assess how they are changing over time.

The students working with Dallas Sherman spent time at the Onion Creek watershed south of Austin on the White Family Property. The group used seismic and resistivity surveys to figure out what was happening beneath the surface of the watershed. They learned how to use different instruments to take measurements, along with electrodes and cables, geophones, and sledgehammers to create models.

Finally, Dr. Staci Loewy led a lab-based group which did research to analyze the age and source composition of a rhyolite from Antarctica. They used their analyses to test the hypothesis that Antarctica was once part of what is now the Franklin Mountains. During the week they crushed rocks, isolated specific minerals (zircons), imaged the zircons using a scanning electron microscope, and then analyzed their ages and compositions using a laser and mass spectrometer.

The 12th grade wrapped up with our GeoFORCE Symposium. The groups' posters were judged by a panel of graduate students and research scientists. The students who placed number one in each of the research groups will be given the opportunity to travel with GeoFORCE to San Francisco this December to present their poster at the American Geophysical Union (AGU) National Conference. We are enormously proud of all the work our GeoFORCE students did this summer and cannot wait to see this new model of the 12th grade academy continue into the future.

Don't be shy! I know it can be very intimidating showing up to these trips, but I promise you that your week will be tons of fun. Since you will be with your cohort all four years of the program, you have the opportunity to make lifelong friendships as you travel the country together.

-Caroline Mackin, Counselor

Embrace everything that comes with it and have fun! You may end up realizing that you love geology and want to study it in the future

-Lainie Stone, Counselor

Be open to new things, new friends, new adventure, new memories

-John Won,
Education Coach

Ask questions about what you see on your trips. The entire experience is a chance to learn. Get to know the people the people around you. They will prove to be great adventure buddies.

-Meredith Martin, Education Coach

2023 GeoFORCE Staff Words of Wisdom

Don't be shy, make as many friends as possible. You may not see the people on your academy very often, but making connections can help so much down the road.

-Enrique Morales, Counselor

Don't be afraid to talk with your peers, you're going to make some incredible friendships during the academy! Getting to know the students. To me, the relationships we form in GeoFORCE is one of the most important and fun parts!

-Tyson McKinney, Instructor

Ask as many questions as you can. It can be science related, trip related, food related. Anything. There is always someone who has the same question as you. You also lead by example, helping others ask their own questions as well!

-Nicole Guinn, Instructor

Really appreciate and soak in this week of exploration that you have been blessed to take part in. Many of the peers, counselors and instructors you meet over the next four years will become lifelong friends/mentors that will help and support you later on.

-Jaime Barerra Jr., Counselor

I would say go in with an open-mind and be open to talking to new people, the days will be really long so you'll want to have people to create memories and share the experiences with.

-Madison Shindler,
Counselor