# GeoFORCE Texas
# Annual Report 2022

# TABLE OF CONTENTS

# GEOFORCE: CHANGING LIVES SINCE 2005



*GeoFORCE Texas is an outreach program of The University of Texas at Austin's Jackson School of Geosciences that introduces high school students from underserved schools to careers in geosciences and STEM by taking them on summer field experiences across the country. The program also helps students apply for college and explore potential career paths through guidance and mentoring.*

GeoFORCE Texas is recognized as one of the most successful programs of its kind in the country. Over 16 years, the program has seen 100% of its alumni finish high school and 90% persist through their second year of college. Of the GeoFORCE Texas alumni who are incoming freshmen in college this year, 42% are majoring in STEM and about 11% are majoring in geosciences — many times greater than the national rate of undergraduate students majoring in the geosciences, according to 2019 data from the American Geosciences Institute.

These are the kind of results that in 2015 earned GeoFORCE Texas the Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring — the highest such honor from the United States government.

GeoFORCE Texas began in 2005. It started in counties surrounding Southwest Texas Junior College. In 2008, the program expanded to schools in the Houston Independent School District. Since then, GeoFORCE Texas has recruited at least one student cohort from each region annually.

Each cohort takes part in the GeoFORCE program for four years. Students start the program the summer before 9th grade, and complete it the summer before 12th grade. During this time, they take trips to some of the most spectacular geologic sites in Texas and throughout the United States, and learn first-hand from geoscientists in the field, the lab and the classroom.

GEAR UP, a federal grant program administered by the Texas Education Agency, has helped expand GeoFORCE's reach, funding a cohort with students from San Antonio, San Marcos, and Livingston. The Jackson School's STEMFORCE program has also helped boost geosciences and STEM outreach in Texas.

In 2021, GeoFORCE Texas opened a permanent Austin cohort, accepting new rising 9th grade students from school districts in and surrounding Austin, Texas. 11th grade students from Austin were also accepted to participate in the STEMFORCE Academy due to the generous donation of the Harman-Mayes-Sooch Family Fund. STEMFORCE is identical to the GeoFORCE 12th Grade Academy. In coming years, STEMFORCE students will be folded in with the new Austin cohort.

After finishing the final summer academy, all GeoFORCE and STEMFORCE students are admitted into the college transition experience and offered resources and guidance through their undergraduate years and beyond.

For more information, visit: ***www.jsg.utexas.edu/geoforce***

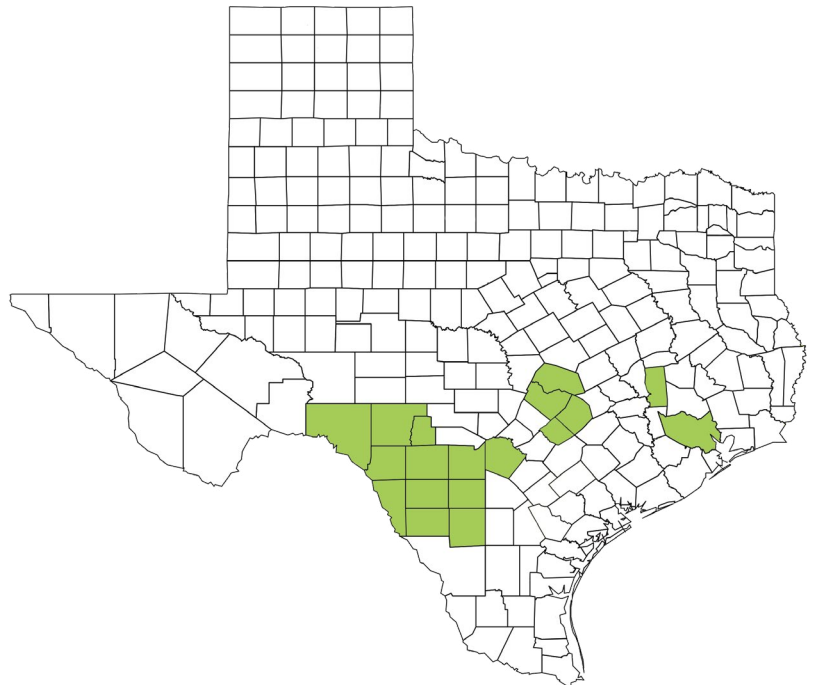# STATISTICS
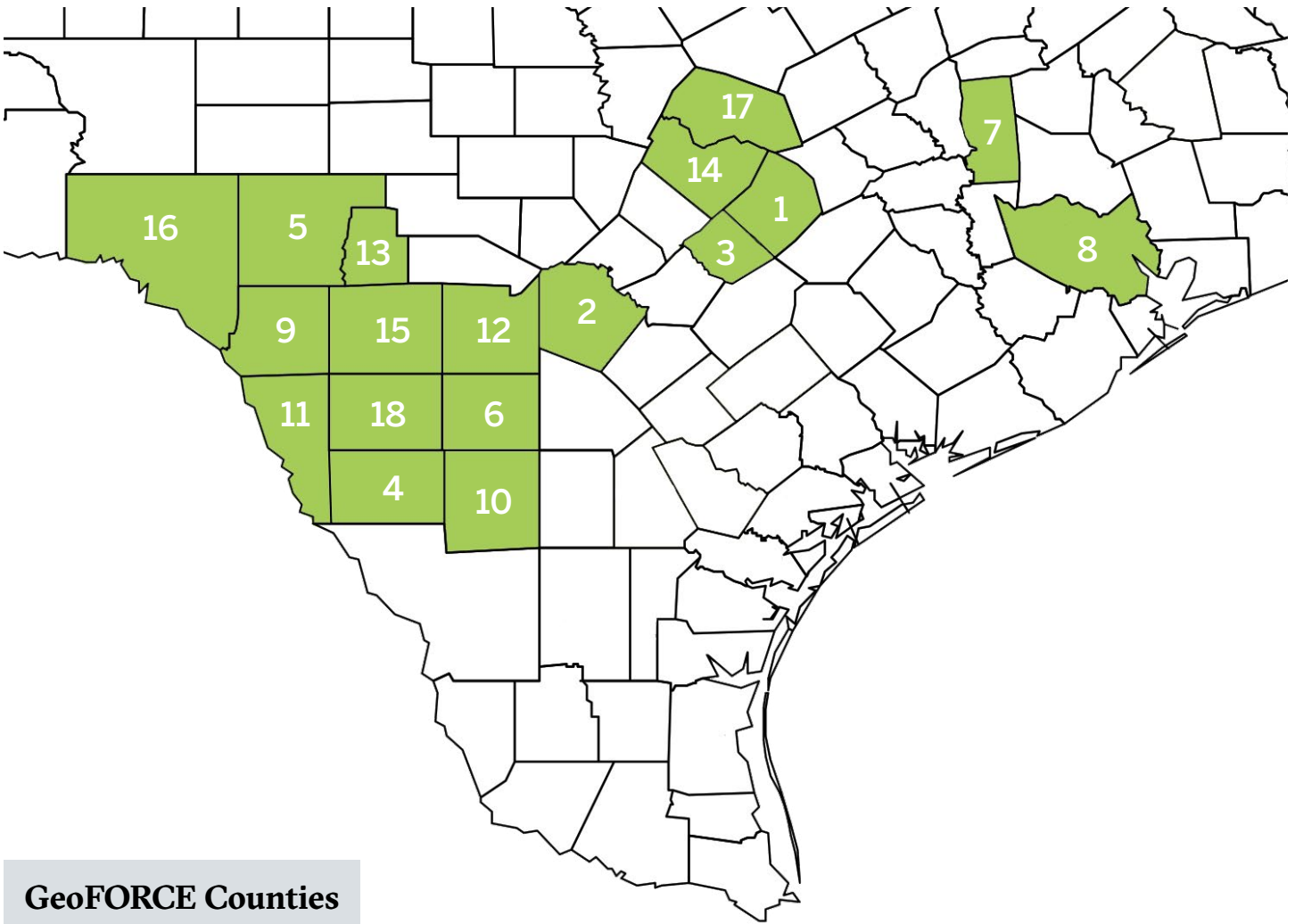
## GeoFORCE Counties

1. Bastrop County
2. Bexar County
3. Caldwell County
4. Dimmit County
5. Edwards County
6. Frio County
7. Grimes County
8. Harris County
9. Kinney County
10. LaSalle County
11. Maverick County
12. Medina County
13. Real County
14. Travis County
15. Uvalde County
16. Val Verde County
17. Williamson County
18. Zavala County

In summer 2022, 441 Texas high school students attended GeoFORCE Texas. The students are divided into four groups. Most of the students are from underserved school districts in Houston and rural Southwest Texas. The GEAR UP group is relatively small, constituting about 8% of GeoFORCE students, and is supported by a federal grant distributed by the Texas Education Agency. Students in this group come from counties throughout the state.

*Numbers may not equal 100% because of rounding.*

## Summer 2022 Attendance

| | |
|---|---|
| GEAR UP | **49** |
| Houston | **110** |
| Southwest | **175** |
| Austin (includes StemFORCE) | **95** |

## GeoFORCE Gender

| | |
|---|---|
| Male | **36%** |
| Female | **62%** |
| Other/Nonbinary | **3%** |

## Overall GeoFORCE Ethnicity
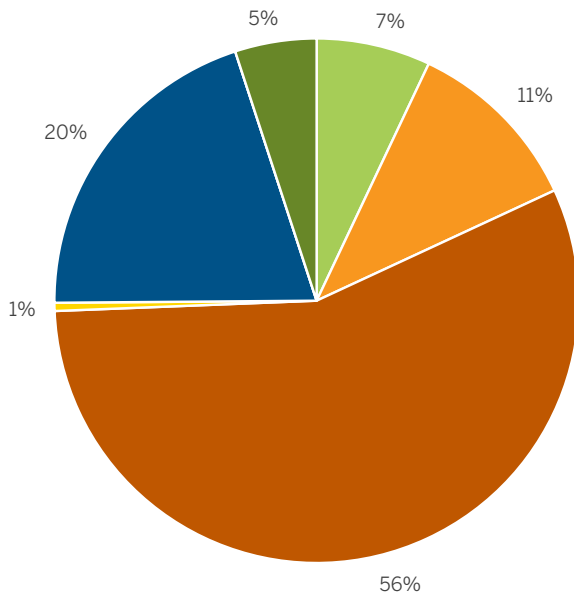


## Houston Cohort Ethnicity
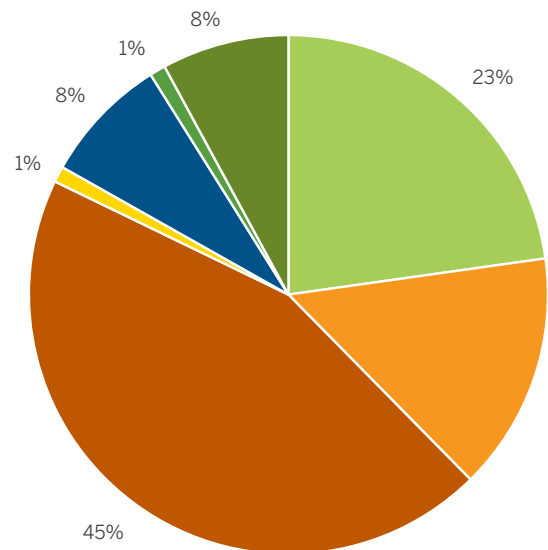


- Black
- Asian
- Hispanic/Latine
- Native American/Indigenous
- White
- Other
- Multiracial (not including white)

## Southwest Cohort Ethnicity

3%
2%
18%
1%
76%

## Austin Cohort Ethnicity

5%
1%
28%
35%
31%

## GEAR UP Cohort Ethnicity

8%
1%
8%
1%
23%
15%
45%

- Black
- Asian
- Hispanic/Latine
- Native American/Indigenous
- White
- Other
- Multiracial (not including white)

A total of 498 GeoFORCE alumni are undergraduate students. Nearly half of first-time freshmen that enrolled in 2022 are majoring in a STEM field, with about 11% of these students majoring in ge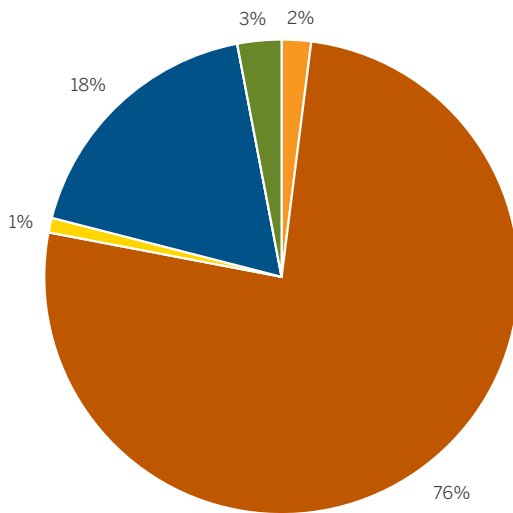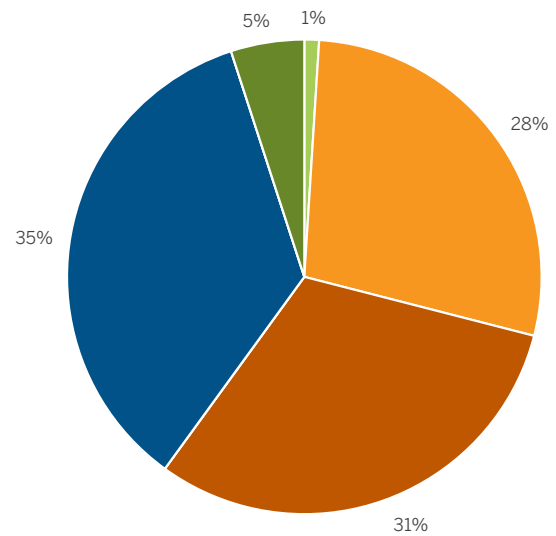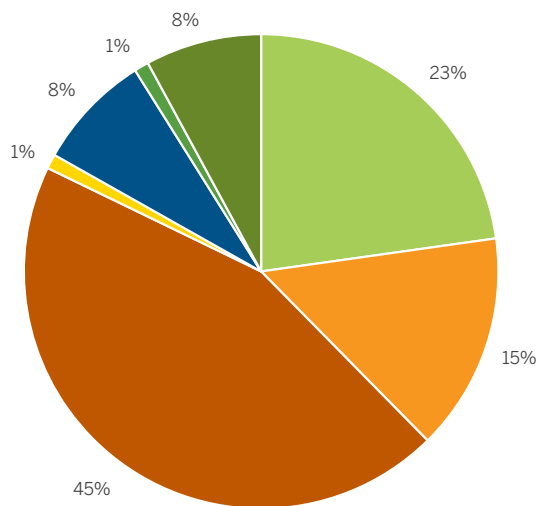osciences. Out of all undergraduates currently enrolled at a four-year university, 5% are geoscience majors. These percentages are far greater than the 0.4% of undergraduate students nationally who graduate with geosciences degrees, according to data collected in 2016 by the National Center for Education Statistics.

*Numbers may not add up exactly because of rounding. STEM data does not include health sciences.*

## Institutions Attended by Undergraduate Geoscience Majors

· Beloit College
· Lehigh University
· Occidental College
· Oklahoma State University - Stillwater/Tulsa
· Sam Houston State University
· Texas A&M University
· Texas A&M University - Corpus Christi
· Texas A&M University - Kingsville
· The University of Texas at Austin
· University of Houston
· University of Texas Arlington
· University of Texas of the Permian Basin

## First-Time Freshmen Majoring in STEM: 42%

| | |
|---|---|
| Freshmen Majoring in Geoscience | **11%** |
| Freshmen Majoring in Engineering | **11%** |
| Freshmen Majoring in Biological Sciences | **6%** |
| Freshmen Majoring in other STEM | **13%** |

## STEM Undergraduates Enrolled at 4-Year Universities: 44%

| | | |
|---|---|---|
| Geoscience Majors | **22** | **5%** |
| Engineering Majors | **37** | **9%** |
| Other STEM Majors | **123** | **29%** |

Geoscience 5%
Engineering 9%
Other STEM 29%
Non-STEM 56%
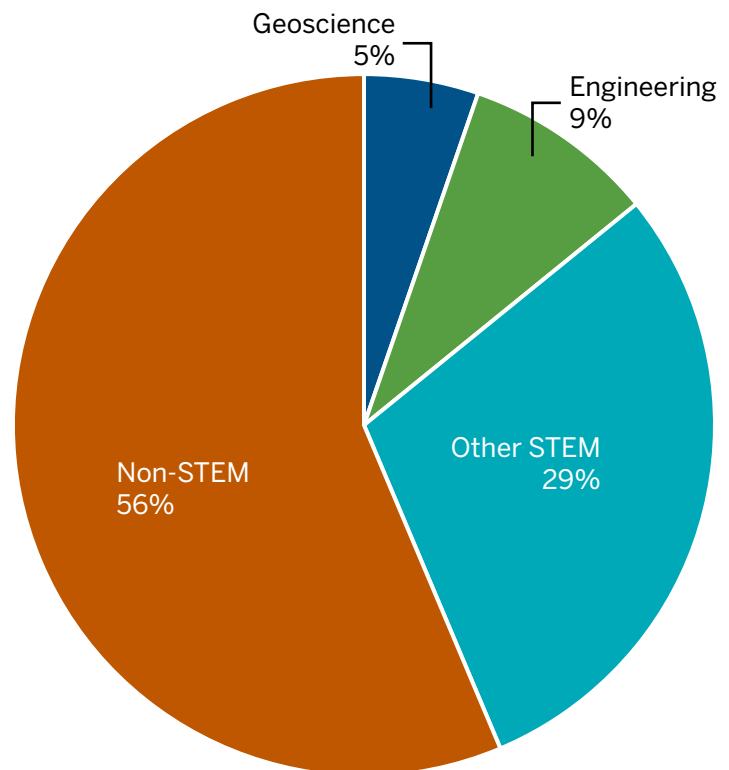
# GRADUATE STUDENTS

**Out of the 100 GeoFORCE alumni who are currently enrolled in graduate school, 46% are studying a STEM field. About 10% of these students are studying geosciences.**

*Numbers may not equal 100% because of rounding.*

| Number of Students: 100 | | |
|---|---|---|
| Geoscience | 10 | 10% |
| Engineering | 10 | 10% |
| Other STEM | 26 | 26% |
| Non-STEM | 54 | 54% |

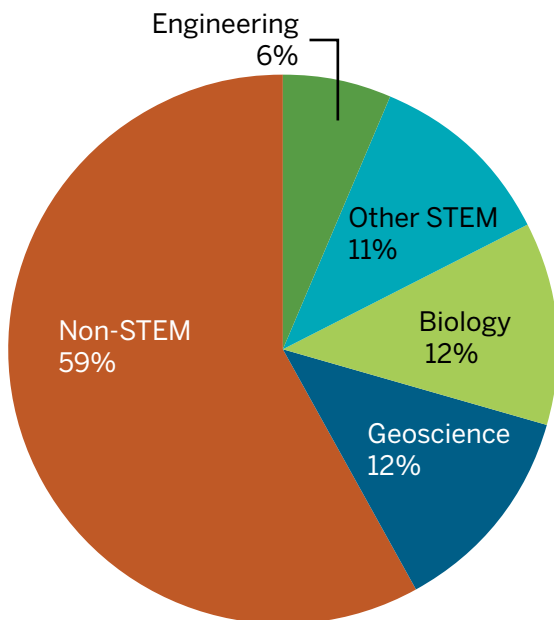| Pursuing Geoscience Graduate Degrees: 10 | |
|---|---|
| Doctoral | 6 |
| Master's | 4 |

## Institutions Attended by Geoscience Graduate Students

· Georgia Institute of Technology
· Michigan State University
· Texas A&M University
· Texas Christian University
· University of Houston
· University of Oregon
· University of Texas at San Antonio
· The University of Texas at Austin

Since 2005, a total of 1,628 students have completed the GeoFORCE program. Students who have graduated college have earned a total of 178 associate's degrees and 712 bachelor's degrees. About 12% of the bachelor's degrees are in geosciences. That is 30 times higher than the 0.4% of bachelor's degrees earned in geosciences by U.S. citizens and permanent residents in 2016, according to the National Center for Education Statistics.

*Numbers may not equal 100% because of rounding. STEM data does not include health sciences.*

## Degrees Earned by GeoFORCE Alumni Through December 2022

### Associate's Degrees: 178

### Bachelor's Degrees: 712

| | |
|---|---|
| Bachelor's Degrees Earned in Engineering | **46** |
| Bachelor's Degrees Earned in Geoscience | **88** |
| Bachelor's Degrees Earned in Biology | **85** |
| Bachelor's Degrees Earned in Other STEM | **80** |
| Bachelor's Degrees in Non-STEM | **413** |

### Master's Degrees: 104

| | |
|---|---|
| Master's Degrees in Geoscience | **18** |
| Master's Degrees in Other Subject | **86** |

### Doctoral and Law Degrees: 14

| | |
|---|---|
| Doctor of Medicine | **3** |
| Doctor of Pharmacy | **3** |
| Doctor of Physical Therapy | **4** |
| Law Degree | **4** |

## Bachelor's Degrees by Majors



Engineering 6%
Other STEM 11%
Biology 12%
Geoscience 12%
Non-STEM 59%

**GeoFORCE students earn bachelor's degrees in geosciences at a rate 30 times higher than the national average.**

# DEVELOPMENT

# SPONSORS AND CHARITABLE FUNDS

**Diamond Sponsor:**
Shell
**Sapphire Sponsor:**
BHP
**Topaz Sponsor:**
Chevron
**Amethyst Sponsors:**
ConocoPhillips
Marathon Oil
**Supporters:**
Halliburton Foundation
Schlumberger BOLD
SEG Foundation

# INDIVIDUAL DONORS

**We would like to recognize the following individuals who contributed to GeoFORCE Texas during the 2021-2022 fiscal year.**

James Anderson
Socorro Aragon
Sara Avant
Marco Barbato
Felix Benavides
Robert Boyce
Charles Caughey
Edward Cazier
Marcus Chroback
Kevin Chu
Jason Clayton
William DeMis
Samuel Dietrich
James Farnsworth
Joel Flores
Sterling Fly
Mary Gates
Gretchen Gillis
Gary Gray
Jeremy Greene
Jennifer Harding
Paul Hardwick
Russell Jackson
Kellie Johnson

Stephen Jumper
Charles Kerans
Robert Killian
Bruno Maldonado
Mark Martin
Rowan Martindale
Steven Mills
Claudia Mora
Sharon Mosher
John Preston
Robert Reed
Christine Skirius
Andrew Smith
Brian Smith
Pamela Speciale
Nicola Tisato
Leah Turner
Jean-Paul Van Gestel
Andrew & Amanda West
Larry Williams
Michael Young

# ENDOWMENT DONORS

**We are grateful for the enduring support of the endowments that have been established to support the program in perpetuity.**

**Jesse and Ina Brundrett GeoFORCE Texas Fund,** *Established in 2016 by the estates of Jesse and Ina Brundrett*

**Charles A. Caughey Endowed Graduate Fellowship,** *Established in 2019 by Mr. Charles A. Caughey*

**Darwin Family GeoFORCE Texas Fund,** *Established in 2009 by Mr. C. Barnes and Mrs. Pamela T. Darwin*

**Friends of GeoFORCE Endowment in Honor of Doug Ratcliff,** *Established in 2014 by friends of Doug Ratcliff in his honor*

**GeoFORCE Texas Fund,** *Established in 2009 by an anonymous donor*

**Gerson Garcia Endowed GeoFORCE Scholarship Fund,** *Established in 2014 by friends in memory of Gerson Garcia*

**John D. Jeffers and Mary E. Edrich GeoFORCE Endowed Excellence Fund,** *Established in 2022 by Mr. John D Jeffers and Ms. Mary E. Edrich*

**Deborah Susan Pfeiffer Endowed GeoFORCE Scholarship,** *Established in 2017 by Mrs. Deborah S. Pfeiffer*

**Janet E. and David I. Rainey GeoFORCE Texas Scholarship,** *Established in 2010 by Drs. Janet E. and David I. Rainey*

**Students Raising Students GeoFORCE Endowment,** *Established in 2017 by the Graduate Student Executive Committee*

**Stephen P. and Katherine Hubby Weiner GeoFORCE Scholarship,** *Established in 2017 by Mr. Stephen P. and Mrs. Katherine H. Weiner*

# ALUMNI VOICES

**Kathryn Stone**
Colby College
Geology / Geoscience

**Megan Marostica**
Trinity College Dublin & Columbia University
Geology / Geoscience

**John Stone**
The University of Texas at Austin
Geology / Geoscience

**Angelica Reyes**
The University of Texas at Austin
Geology / Geoscience

**Sofia R. White**
The University of Texas at Austin
Geology / Geoscience

**Ruby Borden**
Northland College
Geology / Geoscience

## Fabián Peña



> "My advice for new GeoFORCE students is to fully submerge in the experience."
>
> *-Fabián Peña*



Though Fabián Peña first joined the GeoFORCE Program over a decade ago, he had no difficulty relaying the "countless great memories" he'd gained as a GeoFORCE student. These included, "having fun on bus rides, enjoying lectures in and out of the field from UT faculty, GeoFORCE staff, and industry professionals, and learning geologic concepts across Texas, while enjoying beautiful views, that built a strong foundation for what has become my career."

Peña expects to receive his master's in Geology from Texas Christian University (TCU) the summer of 2023. He earned his Bachelor of Science in Geology from The University of Texas at San Antonio in 2018. After receiving his bachelor's, he worked as a mudlogger then a Measurement While Drilling (MWD) engineer at Halliburton, an energy services company who generously sponsored GeoFORCE academies for years—including while Peña was a student.

"I worked a total of 14 months in the West Texas oilfields before starting my master's degree," Peña said. "I wanted to gain field experience before furthering my understanding of geology in graduate school."

Peña's graduate research is a detrital-zircon geochronology study of a sedimentary basin in southern Oklahoma. Alongside his research and classes, Peña served as the head teaching assistant for TCU's geology department in fall 2021, is vice president of their student chapter of the American Association of Petroleum Geologists (AAPG), and was team captain for TCU's Imperial Barrel Award team—a petroleum exploration competition hosted by AAPG.

Peña hopes to find employment as a petroleum geologist at an energy company once he completes his master's.

"My advice for new GeoFORCE students is to fully submerge in the experience," Peña said. "I look forward to implementing all the knowledge and experience I have acquired since my days in GeoFORCE. I am entering the workforce with an open mind and look forward to contributing my drive and passion to innovation and sustainability."

**ABOVE:** FABIÁN PEÑA AT WHITE SANDS NATIONAL MONUMENT DURING THE 12TH GRADE YOUNG GEO GEOFORCE TRIP. PHOTO: GEOFORCE.

**BELOW:** FABIÁN PEÑA AT BIG BEND NATIONAL PARK IN 2022. PHOTO: FABIÁN PEÑA.

## Leslie Jordan





> "I decided I wanted to be a geologist on that trip because I was amazed by the formation and I knew I could study stratigraphy forever!"
>
> *-Leslie Jordan*

**ABOVE:** LESLIE JORDAN AT GLEN CANYON DAM IN PAGE, ARIZONA, DURING A GEOFORCE 10TH GRADE ACADEMY TRIP. PHOTO: GEOFORCE.

**BELOW:** LESLIE JORDAN AT A SCHLUMBERGER EXTERNSHIP EXPERIENCE. PHOTO: LESLIE JORDAN.

Leslie Jordan is the newest GeoFORCE alumna to take a position with one of the same companies that funded her four summers as a GeoFORCE student. "I remember the Grand Canyon trip, sophomore year, the most vividly," Jordan said. "I decided I wanted to be a geologist on that trip because I was amazed by the formation and I knew I could study stratigraphy forever!"

Jordan graduated from the GeoFORCE program in 2013 and went on to earn her B.S. in Environmental Science, with a focus on geology, from The University of Texas at Austin Jackson School of Geosciences in 2017. While an undergraduate student, Jordan had a summer internship with the U.S. Geological Survey (USGS) and worked in a tephrochronology lab where she was introduced to biostratigraphy—a field that quickly became one of her passions.

Jordan continued to study stratigraphy while earning her Master's in Geoscience at Rutgers University in New Jersey. After graduating, she did an internship with ExxonMobil, working in the specialist stratigraphy group. Now, she's a petrophysicist at Schlumberger.

"My main duties entail working with the software Techlog, one of the oil and gas industry's standard software used to view and interpret borehole data," Jordan explained. "I work with clients to solve any issues they have with the software and I interpret data from the field. The focus on innovative technology [at Schlumberger] is amazing and I get to work on projects and with people from all over the world!"

# ALUMNI SPOTLIGHT

## Enrique Morales





In December 2020, Enrique Morales put together his first research poster in order to share his GeoFORCE 12th grade capstone project at the American Geophysical Union's virtual Bright STaRS event. In March, he presented the same poster at the Jackson School of Geosciences 10th Annual Student Research Symposium and was awarded 2nd place in the symposium's high school category, alongside fellow GeoFORCE alumna Lochana Kalyanaraman.

This success is the perfect way for Morales to end his time as a GeoFORCE student and transition into his college career at the Jackson School. After applying to and being accepted by eight different geology programs, Morales decided to attend the Jackson School

*"Not only is it one of the best geology schools in the nation, it helped shape me into who I am today."*

*-Enrique Morales*

because of its world-class education and the close connections he forged during his time in GeoFORCE.

"The Jackson School will always have a special place in my heart," Morales said. "Not only is it one of the best geology schools in the nation, it helped shape me into who I am today. The memories and relationships that I formed because of the Jackson School were just too much for me to give up."

Morales is a senior at Uvalde High School. It was his 11th grade academy trip that made him decide to major in geology.

"I traveled with the Houston group that year because of a conflict in schedule and experienced a culture shock," Morales explained.

"I saw that they were at a different stage academically and had more opportunities than the majority of the students in the Southwest group. I challenged myself to

step up and prove that I was in the same league as them by focusing more and studying extra hard for tests. Because of this, I began to truly appreciate geology for what it was."

It will be a big transition from small town Uvalde to the city of Austin this fall, but Morales said he is looking forward to what opportunities The University of Texas at Austin, the Jackson School, and the world have to offer him.

**ABOVE:** ENRIQUE MORALES AT THE GRAND CANYON IN SUMMER 2018. PHOTO: GEOFORCE.

**BELOW:** ENRIQUE MORALESCOLLECTING AQUATIC INSECTS TO HELP DETERMINE WATER QUALITY OF A STREAM ON SANTA CRUZ ISLAND IN CALIFORNIA AS PART OF A RESEARCH PROJECT WITH THE NATIONAL HISPANIC ENVIRONMENTAL COUNCIL (NHEC). PHOTO: ENRIQUE MORALES.

## Kaelie Contreras





Kaelie Contreras came from the small town of Sabinal, Texas, when she joined the GeoFORCE Texas program in the summer of 2008. A decade later, Contreras earned a Bachelor of Science in Geoscience and a minor in Geographic Information Science (GIS) from Texas Tech University.

"Going to graduate school was always part of the plan because I wanted to gain a deeper understanding of the field," Contreras said. "I've loved math since I was a kid and felt I needed more of that, so I looked into geophysics."

Contreras is a master's student at The Pennsylvania State University, where she expects to defend her thesis this fall and graduate in December. Her research involves imaging the Bushveld Complex

*"This degree has steered me towards something I really enjoy — seismology."*

*-Kaelie Contreras*

in South Africa using seismic waves generated by earthquakes.

"I had no clue what to do research in [when applying for graduate schools]," Contreras said. "But this was the absolute best decision I could have made. This degree has steered me towards something I really enjoy – seismology. It feels great to be in a place where I'm seeing the hard work pay off."

Before enrolling at Penn State, Contreras interned as a GIS analyst for Freeport McMoRan. This summer, she is interning in Melbourne, Florida, where she analyzes waveforms to predict the location and size of a seismic event. She's also an extern science writer for Temblor Earthquake News, where scientists and journalists provide the public with understandable information about natural hazards, recent earthquake studies, and more. After earning her

master's, Contreras hopes to work for the government as a geophysics employee or contractor.

"All of these experiences were intentional because I'm curious about everything and want to find a career that I'll love," Contreras said. "Seismology gives me the combination of coding, physics, and geology along with some mapping and report writing sprinkled in there. That's the best of all of my experiences!"

Besides her academic and career experiences, Contreras is passionate about outreach and mentoring. She said the mentorship of the GeoFORCE program and its coordinators taught her the power of outreach and leading by example. She plans to use her future platform to help others get excited about STEM.

**ABOVE:** KAELIE CONTRERAS AT WHITE SANDS NATIONAL MONUMENT DURING THE 12TH GRADE YOUNG GEO GEOFORCE TRIP. PHOTO: GEOFORCE.

**BELOW:** KAELIE CONTRERAS DURING FIELD CAMP IN MOAB, UTAH IN SUMMER 2018. PHOTO: KAELIE CONTRERAS.

# GEOFORCE STAFF

# CONTACT US

## GeoFORCE Staff



***Leah Turner, Ph.D.***
Program Director

leah.turner@jsg.utexas.edu



***John Hash***
Coordinator

jhash@jsg.utexas.edu



***Carlton Lloyd***
Coordinator

clloyd@jsg.utexas.edu



***Jennifer Peña***
Outreach Coordinator

jennifer.pena@jsg.utexas.edu



***Mitchel Lambert***
Outreach Coordinator

mitchel.lambert@jsg.utexas.edu



***Eleanor Cote***
Outreach Coordinator

eleanor.cote@jsg.utexas.edu



***Jasmine Gulick***
Program Coordinator

jasmine.gulick@jsg.utexas.edu

## Jackson School Supporting Staff



***Dana Thomas, Ph.D.***
Senior Academic
Program Coordinator

dthomas@jsg.utexas.edu

**Stay Connected**  @GeoFORCETexas  @geoforce_texas  web jsg.utexas.edu/geoforce