

# UTSA Earth and Planetary Sciences

## College of Sciences

# Newsletter 2022-2023

## Message from the Department Chair

It is my pleasure to represent our students, faculties, and staff as to their participation in making this year's newsletter possible. The goal of our department is to promote a comprehensive learning and research environment in Earth and Planetary Sciences under the College of Sciences, with Earth Science/Geoscience being one of the fastest growing disciplines in educational institutions in the nation and South Texas. This past year has been exemplified by our students' accomplishments and successes in various territories. It ranges from obtaining employments right after graduation, building more partners with local industry, acquiring resources, representing our science at various conferences, and presenting award winning proposals. On the same token, our faculties were equally productive in developing new courses but also bringing in some of the best federal grants within the last two years. The most important accomplishment for the department has been to recruit one new faculty member among us and in a growing subdiscipline of Planetary Sciences. We are thrilled to welcome our new member and we are overseeing the growing interest of students in terms of Planetary Sciences research. We have also streamlined the Environmental Science and Engineering PhD program and our students now have a home for each and every program. This newsletter will guide you through the exciting events and great achievements from our faculty, staff, and students that have occurred in our department. I hope you will enjoy the newsletter and please reach out to me or any one of us for your ideas to make this department a home for the future Earth and Planetary Scientists.



Saugata Datta, Professor and Chair,  
Department of Earth and Planetary Sciences



The EPS Fall 2022 social where the whole department got together for a potluck!



Visit Our Website! [https://www.utsa.edu/sciences/earth-  
planetary-sciences/](https://www.utsa.edu/sciences/earth-planetary-sciences/)

# Faculty Highlights

- ❑ **Professor Stephen Ackley** awarded the 2022 SCAR (Scientific Committee on Antarctic Research) Medal for International Coordination. An important SCAR activity is recognition of excellence in Antarctic and Southern Ocean research and outstanding service to the international Antarctic community.
- ❑ **Dr. Matt Cannon** created a new teaching concentration in the Bachelor of Arts in Geosciences degree in collaboration with the UTeachSA program and with the help of the undergraduate curriculum committee (Sandy Cannon, Janet Vote, and Alberto Mestas). Students who complete this degree will be certified to teach 6-12 Physical Sciences in the state of Texas.
  - Represented the department of Earth and Planetary Sciences at the Southwest Gem and Mineral Societies Fiesta of Gems.
  - Appointed Undergraduate Advisor of Record for the Department of Earth and Planetary Sciences and lead a push to simplify the BA and BS degree streamlining the course sequence for the 24-26 catalog cycle.
- ❑ **Dr. Saugata Datta** received the GSA Geology and Health Division Meritorious Service Award. The award recognizes outstanding contributions to the mission of the GSA Geology and Health Scientific Division.
  - Named a 2022 GSA Fellow. Society Fellowship is an honor bestowed on the best of the profession by election at the spring GSA Council meeting in recognition of a sustained record of distinguished contributions to the geosciences and the Geological Society of America.
- ❑ **Dr. Yongli Gao** has been promoted to Full Professor.
- ❑ **Dr. Alexis Godet** was appointed Graduate Advisor of Record of the ESE PhD program for the College of Sciences.
- ❑ **Dr. Alberto Mestas** was recently invited to attend the launch of NASA's Tropospheric Emissions: Monitoring of Pollution (TEMPO) satellite, Friday, April 7 at Kennedy Space Center, Florida. UTSA will soon become a member of a validation network for TEMPO through the upcoming installation of a Pandora spectrometer in its Downtown Campus to measure air quality downtown San Antonio (see the New Grants list on Page 5)
- ❑ **Professor Janet Vote** has been promoted to Assistant Professor of Practice.



Matt Cannon at BBNP



View of Cliff Palace looking north with Blake Weissling

- ❑ **Dr. Blake Weissling** is joining a 4-year UTSA Research Effort in Support of Investigation, Documentation and Assessment at Cliff Palace, Mesa Verde National Park, Colorado. Blake's role in this project is to provide geophysical survey assessments of structures within the ruins – data that will ultimately inform structural engineering models of masonry walls and foundations.
- ❑ **Dr. Alan Whittington** "Moon Life" Article in the Spring 2023 Sombrilla. In a NASA-funded joint venture with Astroport Space Technologies, Alan and his team are researching ways to build launch pads and other structures on the Earth's Moon.
- ❑ **Dr. Hongjie Xie** becomes a SCAR Geosciences Scientific Group Representative. The U.S. Scientific Committee on

Antarctic Research (US-SCAR) promotes polar science within the U.S. and the international Antarctic scientific community by facilitating the participation of U.S. scientists in SCAR activities.

- ❑ **Dr. Saugata Datta and Dr. Harshad Kulkarni** awarded NSF RAPID Grant. RAPID is a type of proposal used when there is a severe urgency regarding availability of, or access to, data, facilities or specialized equipment, including quick-response research on natural or anthropogenic disasters and similar unanticipated events.

# Welcome New Faculty!

**Kaushik Mitra:** Dr. Mitra is a planetary geoscientist and an aqueous experimental geochemist. He received his Integrated B.Sc. and M.Sc. Degree in Applied Geology in 2015 from the Indian Institute of Technology (IIT) Kharagpur in India. He received his Ph.D. from the Department of Earth & Planetary Sciences at Washington University in St. Louis in 2021 where he was a NASA FINESST fellow. Prior to joining EPS, UTSA, he was a postdoc in the Department of Geosciences at Stony Brook University.



**Expertise:** Kaushik uses a combination of lab experiments, geochemical modeling, and field investigations to study Aquaplanets, planetary bodies with liquid water on their surface and subsurface, both in the past (like Mars and Ceres) and in the present (like Europa and Enceladus). His research investigates geochemical processes occurring on the surface of planetary bodies at the intersection of the lithosphere, hydrosphere, and atmosphere. He specifically focus on halogens, oxyhalogens mainly, and their inter-connectedness with various redox sensitive elements like iron, manganese, sulfur, and carbon. His research helps to understand the astrobiological potential and conduct the paleoenvironmental reconstruction on of early Mars.

Kaushik's Experimental Planetology Laboratory (EPL) [or Mitter Lab] will be equipped to conduct experiments in controlled environments to mimic different planetary bodies surfaces to establish fundamental geochemical parameters at non-ambient temperature and pressure conditions as well as aimed at hypothesis testing. The lab will be especially equipped to conduct aqueous phase experiments with material characterization capabilities using X-Ray Diffractometer instrument with non-ambient sample stage capabilities (P, T, Relative Humidity). The lab will also develop a Planetary Surface Simulator that will be capable of mimicking the surface conditions on terrestrial planets (Mars, Mercury), Titan, and airless bodies (like Moon, asteroids) in the Solar System. His latest research on manganese oxidation was recently published in Nature Geoscience in which he shows that early Mars likely did not have oxygen. It has been covered by more than 45 news outlets in 60+ stories including ScienceDaily, Phys.org, Interesting Engineering, Space.com, Eurekalert and other news agencies. The article is in the top 5% of all research outputs scored by Altmetric.

Kaushik strongly believes in equity and inclusion, and regularly participates in educational research, outreach, and community development via education and active learning. He also teaches chemistry, geology, and planetary sciences on his YouTube channel.

## New Instruments



### The **AccuFlo AF10-CE micro-abrasive blaster** in the **Rock Lab.**

It is used for fossil preparation by using varying abrasives to remove matrix from specimens and expose the morphological characteristics of the specimen being studied. This allows students and faculty in the department to expose fossils for study, which can enhance not only paleontological studies, but stratigraphic and paleoenvironmental studies as well.

The unit was originally obtained by Dr. Lambert through the **MORESE Grant** from the Department of Education and put into service this semester by Janet Vote for use in an Independent Study.

# Student Highlights

- ❑ **PhD Student Ashley Aguilar Received a Research and Development Fellowship with the City of San Antonio**
- ❑ **MS Student Adriana Ariza Pardo was awarded \$2000 to attend the NASA Planetary Data Training Workshop at Arizona State University in May**
- ❑ **Undergraduate Student Tiffany Barker-Edwards Received Internship with Keck Geology Consortium**

This internship is an advanced project in the Michigan Basin that will be largely completed in the summer of 2023 with mentorship during the Fall of 2023. Mentor will be: Sandy Cannon.

- ❑ **Congratulations to Tiffany Barker-Edwards, 2022 Dean's Fund for Excellence Award Recipient**

Tiffany is a junior Geosciences major focusing on earth system and climate.

- ❑ **#ThisIsWhatAScientistLooksLike: Tiffany Barker-Edwards**
- ❑ **#AwesomeAlum: Heidi Harwick**
- ❑ **Izzy Heathman Awarded the 2023 COS Outstanding Graduate Student Award**
- ❑ **MS Student Steven Hollan Elected as GSA Geology and Health Student Representative**

The student representative advises on matters concerning GSA student and early career issues, as well as Geology and Health Scientific Division outreach to a young audience, including social media.

- ❑ **Undergraduate Student Cassidy Lane was awarded \$2500 for an NSF Fellowship**
- ❑ **Undergraduate Student Lauren Malesky Renovated the Mineral Display for the Department**



Lauren Malesky with the new display

After cataloging the over 800 specimen Hamilton collection, Lauren made custom labels for each piece and revitalized the EPS 2<sup>nd</sup> floor display with minerals, fossils, and an educational section to help others learn more about Geology.

- ❑ **MS Student Ruben Olivares Awarded GSA Geology and Health Division Student Research Grant**

The GSA Geology and Health Division's focus is to develop the highest quality understanding of the origins and fates of naturally occurring materials that affect health and the earth processes that affect health.

- ❑ **MS Student Justin Sharpe Awarded NSF Graduate Research Fellowship**

This fellowship will provide Justin with funds for his doctoral degree. Justin's research plan includes study locations in Texas, Brazil, Guatemala, and Mexico.

- ❑ **#ThisIsWhatAScientistLooksLike: PhD Student Tom Varner**  
Tom is an Environmental Science and Engineering (ESE) PhD student.

- ❑ **PhD Student Tom Varner Qualified for a Fulbright Scholarship**

The title of his Fulbright project is "The Iron Curtain: Impacts on Arsenic Mobility along the Banks of the Hooghly River." Tom will be working with two prominent universities in India.

- ❑ **Earth Day Undergraduate Poster Competition Winners:**

First Place: Austin Patridge, Second Place: Jaida Veiga, Third Place: Cassidy Lane

- ❑ **Earth Day Graduate Poster Competition Winners:**

First Place: Corrinne Kotara, Second Place: Salman Sakib, Third Place: Samuel Oseji



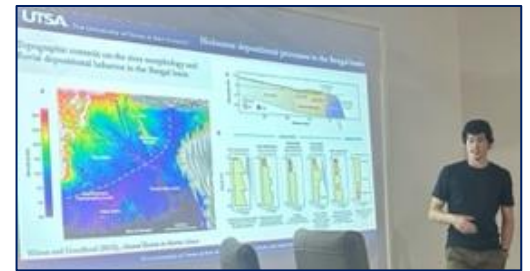
Tiffany Barker-Edwards at Big Bend National Park during Spring Break



Group selfie at Earth Day 2023

# New Grants

- ❑ *Center for Advanced Measurements in Extreme Environments (CAMEE)*. NASA MIRO, (UTSA). Active from 10-01-2022 to 09-30-2024. PI: **Chris Combs** (UTSA), co-PI's: **Steve Ackley, Alberto Mestas-Nunez, Daniel Pineda, Alan Whittington**
- ❑ *INTERN supplement to NSF GEO-NERC: Collaborative Research: Multi-scale investigation of rheology and emplacement of multi-phase*. NSF EAR, (UTSA). Active from 03-15-2023 to 03-14-2024. PI's: **Alan Whittington**. Intern: **Brenna Halverson**
- ❑ *An Air Quality Monitoring Station to Expand NASA's Pandora Network to South Texas*, NASA, 2022-2027, PI: **A. Mestas-Nuñez**, co-PIs: **D. Pineda, N. Debbage, K. Bhaganagar**.
- ❑ UTSA, Office of Research Support, Mapping karst features and water quality using drones, (PI) **Yongli Gao**
- ❑ RAPID: Impacts of high magnitude wildfire on volcanic (lava) cave water chemistry, nutrient transport, activity and diversity of cave microbiome. PI: **Saugata Datta**



Tom Varner presenting his research in India

# Scholarships

## ❑ Fulbright Scholarship

- Doctoral Student Recipient: Tom Varner

## ❑ Beck Scholarship

- Student Recipient: Heidi Harwick: This scholarship enabled Heidi to travel to Tampa, Florida to present her research paper at the 17th Sinkhole Conference in March 2023.

## ❑ Amy Shelton & V.H. McNutt Endowed Presidential Scholarship

- Emma Dorrell
- Wesley Arrizon
- Maria Rodriguez-Rodriguez
- Justin Sharpe
- Samuel Oseji
- Vanessa Costilla Bermea
- Korei Patterson
- Chinenye Agbim
- Noah Klitus
- Dana Griggs
- Tiffany Barker-Edwards
- Austin Patridge
- Cassidy Lane
- Elizabeth Heathman
- Ross Glore



Korei Patterson with Alex Godet at the Earth Day poster presentations

## ❑ San Antonio Geophysical Society Research Scholarship

- Noah Klitus
- Korei Patterson

## ❑ Jerry Wayne Earnest Memorial Scholarship of the Geosciences in the COS Wilford L Stapp Memorial Fund for Undergraduate Research Mrs. Parvathammal Endowed Scholarship

- Korei Patterson

# Publications

- ❑ Merriman, J.D.\*, **Whittington, A.G.**, and Hofmeister, A.M., 2023. A mineralogical model for thermal transport properties of rocks: Verification for crystalline rocks at ambient conditions. *Journal of Petrology*, 63: 1-30 <https://doi.org/10.1093/petrology/egad012>
- ❑ Isom, S., Andrews, G., Kenderes, S.\*, and **Whittington, A.**, 2023. Making sense of brittle deformation in silicic lavas: Insights from Obsidian Dome, California. *Geosphere*, 19: <https://doi.org/10.1130/GES02499.1>
- ❑ Bondar, D., Withers, A., **Whittington, A.**, Fei, H., and Katsura, T., 2023. Dissolution mechanisms of water in depolymerized silicate (peridotitic) glasses based on infrared spectroscopy. *Geochimica et Cosmochimica Acta*, 23: 45-61, <https://doi.org/10.1016/j.gca.2022.11.029>
- ❑ **Morrison, A.A.\***, **Whittington, A.**, and Mitchell, K.L., 2023. A re-evaluation of cryolava flow evolution: Assumptions, physical properties, and conceptualization. *Journal of Geophysical Research*, 128: e2022JE007383, <http://dx.doi.org/10.1029/2022JE007383>
- ❑ **Morrison, A.A.\***, **Whittington, A.**, Zhong, F., Mitchell, K.L., and Carey, E.M., 2022. The viscosity of cryovolcanic liquids. *Geochimica et Cosmochimica Acta*, 339: 97-114, <https://doi.org/10.1016/j.gca.2022.10.019>
- ❑ Kenderes, S.M.\*, Befus, K.S., Bryson, A.N.\*\*\*, and **Whittington, A.**, 2022. Thermal histories and emplacement dynamics of rhyolitic obsidian lavas at Valles caldera, New Mexico. *Bulletin of Volcanology*, 84: 98, <https://doi.org/10.1007/s00445-022-01606-z>
- ❑ Wang, W., K. Ewoldt, M. Xie, **A. Mestas-Nuñez**, S. Soderman and J. Wang, 2023: Virtual Summer Camp for High School Students with Disabilities -- An Experience Report. In *Proceedings of the 54th ACM Technical Symposium on Computer Science Education V. 1 (SIGCSE 2023), March 15-18, 2023, Toronto, ON, Canada*. ACM, New York, NY, USA, 7 pp, <dl.acm.org/doi/10.1145/3545945.3569818>
- ❑ Macdonald, G.J., **S.F. Ackley**, and **A.M. Mestas-Nuñez**, and A. Blanco-Cabanillas, 2023: Evolution of the dynamics, area, and ice production of the Amundsen Sea Polynya, Antarctica, 2016-2021, *The Cryosphere*, 17, 457-476, <doi.org/10.5194/tc-17-457-2023>
- ❑ Huang, Y., Knappett, P.S., Berube, M., **Datta, S.**, Cardenas, M.B., Rhodes, K.A., Dimova, N.T., Choudhury, I., Ahmed, K.M. and van Geen, A., 2022. Mass fluxes of dissolved arsenic discharging to the Meghna River are sufficient to account for the mass of arsenic in riverbank sediments. *Journal of Contaminant Hydrology*, 251, p.104068.
- ❑ Shaikh, W.A., Kumar, A., Chakraborty, S., Naushad, M., Islam, R.U., Bhattacharya, T. and **Datta, S.**, 2022. Removal of toxic dye from dye-laden wastewater using a new nanocomposite material: Isotherm, kinetics and adsorption mechanism. *Chemosphere*, 308, p.136413.
- ❑ Patton, E.M., Adam, C., Steward, D.R. and **Datta, S.**, 2023. Effect of low-permeability layers on vadose well recharge rates. *Groundwater for Sustainable Development*, p.100938.
- ❑ **Godet, A., Suarez, M.B., Price, D., Lehrmann, D.J.** and Adams, T. (2023). Paleoenvironmental constraints on shallow-marine carbonate production in central and West Texas during the Albian (Early Cretaceous). *Cretaceous Research* 144: 105462.
- ❑ Mancini, A., Brandano, M., Cornacchia, I., Frijia, G., **Godet, A.**, and Sun, Y., eds. (2023). Chemostratigraphy of Carbonate Systems Through Time and Space: From Continental to Deep-Water Records. *Frontiers in Earth Science*
- ❑ Schmitt, K.E., Huck, S., Krummacker, M., De Winter, N.J., **Godet, A.**, Claeys, P., and Heimhofer, U. (2022). Radiolitic rudists: an underestimated archive for Cretaceous climate reconstruction? *Lethaia* 55 (4): 1-21.
- ❑ Tesauro, J., Sheppard, C., Adams, T., **Godet, A., Price, D., Sharpe, J., Suarez, M.** and Lehrmann, D. (2022). Sedimentologic and geochemical analysis of dinosaur track sites of the Davenport Ranch, Bandera County and comparison with other dinosaur track sites in the Lower Cretaceous Glen Rose Formation of central Texas. *STGS Bulletin LXIII*: 11-26.

# Publications

- ❑ Shen, S., D. Yuan, C. M. Henderson, **L. L. Lambert**, Y. Zhang, D. H. Erwin, J. Ramezani, X. Wang, H. Zhang, Q. Wu, W. Wang, J. M. Hearst, J. Chen, Y. Wang, W. Qie, Y. Qi, and B. R. Wardlaw. 2022. The Global Stratotype Section and Point (GSSP) for the base of the Capitanian Stage (Guadalupian, Middle Permian). *Episodes* 45(3):309-331.
- ❑ Masuma Iqrah, J., **Koo, Y.**, Wang, W., **Xie, H.**, Prasad, S., 2023. Toward Polar Sea-Ice Classification using Color-based Segmentation and Auto-labeling of Sentinel-2 Imagery to Train an Efficient Deep Learning Model. *arXiv preprint arXiv:2303.12719*.
- ❑ Wang, T., Li, D., Cheng, X., Lan, J., Edwards, R.L., Cheng, H., Liu, X., Xue, G., Xu, H., Ma, L., Zang, J., Wang, Y., **Gao, Y.**, Sinha, A., Tan, L., 2022, Hydroclimatic changes in south-central China during the 4.2 ka event and their potential impacts on the development of Neolithic culture. *Quaternary Research*, <https://doi.org/10.1017/qua.2022.11>
- ❑ Xia, X. & **Gao, Y.**, 2022, Validity of geochemical signatures of abiotic hydrocarbon gases on Earth. *Journal of the Geological Society*, <http://dx.doi.org/10.1144/jgs2021-077>
- ❑ Gulishengmu, A., Yang, G., Tian, L., Pan, Y., Huang, Z., Xu, X., **Gao, Y.**, and Li, Y., 2023, Analysis of Water Resource Carrying Capacity and Obstacle Factors Based on GRA-TOPSIS Evaluation Method in Manas River Basin. *Water*, 15(2), 236, <https://doi.org/10.3390/w15020236>
- ❑ Xia, X., and **Gao, Y.**, 2023, Determining Reaction Paths by Evaluating Kinetic Isotopic Effects with Density Functional Theory: Example of Methane Thermogenesis. *Journal of Chemical Information and Modeling*, <https://doi.org/10.1021/acs.jcim.3c00531>
- ❑ Chen, L., Tan, L., Zhao, M., Sinha, A., Wang, T., and **Gao, Y.**, 2023, Karst carbon sink processes and effects: A review. *Quaternary International*, <https://doi.org/10.1016/j.quaint.2023.02.009>
- ❑ Ran, M., Tian, H., Yang, G., Li, X., Tian, L., Kong, C., Liu, B., Li, P., Xue, L., Li, F., Li., Y., and **Gao, Y.**, 2023, Source Water Apportionment Using Stable Isotopes for Typical Riparian Plants along the Manas River in Xinjiang, Northwest China. *Water*, 15(5), 927, <https://doi.org/10.3390/w15050927>
- ❑ Xu, X., Tian, H., Yang, G., Li, X., He, X., Li, Y., **Gao, Y.**, Li, F., Li, P., Liu, B., and Xue, L., 2023, Spatial and temporal changes in land and water resources on the northern slopes of the Tianshan mountains from the perspective of “production-living-ecological space”. *Frontiers in Environmental Science*, 11, 291, <https://doi.org/10.3389/fenvs.2023.1121248>

# Conference Presentations

- ❑ **Nordstrand, T., Kulkarni, H., Gao, Y, Ackley, S.**, Felton, A., & Hutchinson, J., 2022, Dissolved Organic Matter and Inorganic Chemical Constituents Characterized in Large Hailstones from South-Central Texas, AGU Fall Meet. Suppl., B22E-1491, <https://agu.confex.com/agu/fm22/meetingapp.cgi/Paper/1192954>
- ❑ **Nordstrand, T.**, Felton, A., **Kulkarni, H., Gao, Y,** Hutchinson, J., & **Ackley, S.**, 2022, Characterization of Atmospheric Microplastics in Large Hailstones from Two Central Texas Supercell Thunderstorms, AGU Fall Meet. Suppl., H56D-05, <https://agu.confex.com/agu/fm22/meetingapp.cgi/Paper/1129477>
- ❑ Ong, C., **Gao, Y, Goddard, F.**, Fu, Q., & Lopez, G., 2022, Analysis of PFAS in the Edwards Aquifer, AGU Fall Meet. Suppl., H32M-1066, <https://agu.confex.com/agu/fm22/meetingapp.cgi/Paper/1133717>
- ❑ Ong, C., \***Goddard, F., Gao, Y,** & Fu, Q., 2022, Analysis of PFAS in the Edwards-Trinity Aquifer System, Fate of PFAS: From Groundwater to Tap Water, Westerville, OH, National Ground Water Association, <https://ngwa.confex.com/ngwa/fpfas2022/meetingapp.cgi/meeting.html>
- ❑ **Nordstrand, T.**, Felton, A., **Gao, Y, Ackley, S.**, & Hutchinson, J., 2022, Analysis of Microplastics in Hailstones from Two Supercell Thunderstorms, *Frontiers in Hydrology*, 322-01, <https://agu.confex.com/agu/hydrology22/meetingapp.cgi/Paper/1027639>

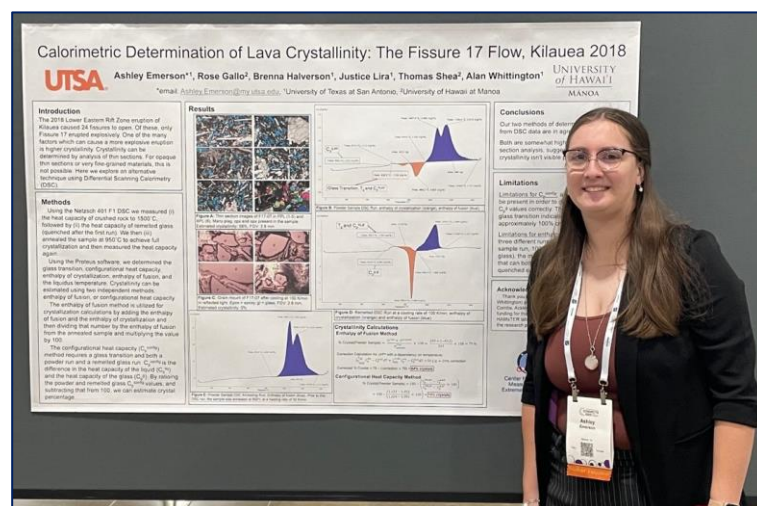
# Conference Presentations

- ❑ **Halverson, B.A.\***, **Whittington, A.**, and Hammer, J., 2023. Bubble interaction and evolution through a basaltic lava flow: Insights from the Ahu'Aila'Au lava field of the Kilauea 2018 eruption. IAVCEI, Rotorua, New Zealand [oral].
- ❑ **Whittington, A.**, **Emerson, A.\***, **Halverson, B.\***, Hammer, J., and **Lira, J.\***, 2023. Better living through calorimetry: Testing methods to determine crystallinity in basaltic lavas with Differential Scanning Calorimetry (DSC). IAVCEI, Rotorua, New Zealand. [oral, given by BH due to Covid]
- ❑ **Whittington, A.**, **Morrison, A.A.#**, **Parsapoor, A.#**, and **Patridge, A.\*\***, 2023. Thermal and rheological properties of lunar simulants from ambient to molten to glass. LPSC, The Woodlands TX. [poster]
- ❑ J. Williams #, S.F. Ackley, **A.M. Mestas-Nuñez**, G.J. Macdonald, Flooded sea ice floe detection in the Antarctic Ocean with Sentinel-1 SAR, 2022 AGU Fall Meeting Chicago, IL and Online Everywhere, December, 12-16.
- ❑ C. Sustayta #, **A.M. Mestas-Nuñez**, An Inverse Calculation of Glider-based Absolute Geostrophic Currents in the Gulf of Mexico, 2022 AGU Fall Meeting Chicago, IL and Online Everywhere, December, 12-16.
- ❑ **A.M. Mestas-Nuñez**, J.K. Sloan ##, K. Mendiondo #, C.A. Moreland #, The Magnitude of the Hurricane Harvey (2017) Freshening Anomaly in the Western Gulf of Mexico, 2022 AGU Fall Meeting Chicago, IL and Online Everywhere, December, 12-16.
- ❑ **M. Joshi #**, **S.F. Ackley**, and **A.M. Mestas-Nuñez**, G.J. Macdonald, Variations in sea ice thickness over Weddell Sea for 2019-2020 using ICESat-2, 2022 AGU Fall Meeting Chicago, IL and Online Everywhere, December, 12-16.
- ❑ I. Oseghae #, K. Bhaganagar, and **A.M. Mestas-Nuñez**, Understanding the Role of Environmental Metrics Affecting Wildfire Vegetation Burn Severity, 2022 AGU Fall Meeting Chicago, IL and Online Everywhere, December, 12-16.
- ❑ **Ackley, S.F.**, M.M. Smith, P. Guest, A. Herman, H.H. Shen Jun-22 Winds, Waves and Ice Formation in a Coastal Polynya Gordon Research Conference (GRC), Polar Marine science, Ventura, California, March 4<sup>th</sup> – 10<sup>th</sup> 2023 and Gordon Research Conference (GRC), Polar Marine science, Ventura, California, March 4<sup>th</sup> – 10<sup>th</sup> 2023.
- ❑ **Kulkarni, H.V.**, **Varner, T.**, Dee, K.T., Ziegler, B., Malina, N., Ojeda, A., Alauddin, M., Finkelman, R., Johannesson, K.H., **Datta, S.** (2023) Characteristics, reactivity and role of natural organic matter (NOM) in elemental cycling in the environment.
- ❑ **Kulkarni, H.V.**, Ford, J., **Datta, S.**, Blank, J. (2023) Geochemical analyses and modelling to understand secondary mineral formation in volcanic (Lava Tube) caves. 4th International Planetary Caves Conference, 4-7th May, Lanzarote, Spain.
- ❑ **Hollan, S.**, Heathman, I., **Kulkarni, H.V.**, Medley, J.J., Hathaway, J.J.M., Philips-Lander, C.M., Northup, D.E., **Datta, S.** (2023) Impacts of high magnitude wildfire on volcanic (lava tube) cave water chemistry. 4th International Planetary Caves Conference, 4-7th May, Lanzarote, Spain.
- ❑ Phillips-Lander, C.M., Lakrou, C., **Kulkarni, H.V.**, **Datta, S.** (2023) Quantifying background microbial biosignatures in lava tubes: implications for future planetary cave exploration. 4th International Planetary Caves Conference, 4-7th May, Lanzarote, Spain.
- ❑ **Varner, T.S.**, **Kulkarni, H.V.**, Cardenas, M.B., Knappett, P.S.K., **Datta, S.** (2023) Variation in sedimentary organic matter properties along the Meghna River – aquifer interface and its implications on arsenic mobility. Goldschmidt Conference, Lyons, France, October 2023.
- ❑ **Hollan, S.**, Heathman, I., **Kulkarni, H.V.**, Medley, J.J., Hathaway, J.J.M., Philips-Lander, C.M., Northup, D.E., **Datta, S.** (2023) Volcanic (lava tube) caves water chemistry influenced by high magnitude wildfires on surface. Goldschmidt Conference, Lyons, France, October 2023.
- ❑ **Godet, A.**, **Price, D.**, **Sharpe, J.**, Davis, C.I., Sheppard, C., Tesauro, J., Adams, T., Lehrmann, D. and **Suarez, M.B.** (2022). Dinosaur track and subaerial exposure surfaces in the Albian Glen Rose Formation of central Texas. South Central section of the Geological Society of America Abstracts with Programs.
- ❑ Tesauro, J., Sheppard, C., Davis, C.I., Adams, T., **Price, D.**, **Sharpe, J.**, **Godet, A.**, Suarez, M., Altiner, D. and Lehrmann, D. (2022). Sedimentologic and geochemical analysis of a dinosaur track site, the Davenport Ranch, Bandera County and comparison with other track sites in the Lower Cretaceous Glen Rose Formation of central Texas. South Central section of the Geological Society of America Abstracts with Programs.
- ❑ Yang, C., **H. Xie**, and X. Miao, 2022. How to leverage AI/ML for Earth Science Research using Arctic sea ice as an example (A workshop of 1.5 hours). EarthCube Annual Meeting: Building Beyond. San Diego, CA, June 14-16.
- ❑ **Koo, Y.**, **Xie, H.**, Kurtz, N.T., **Ackley, S.F.**, 2022, Thermodynamic and dynamic sea ice growth in the Ross Sea from ICESat-2, Fall AGU Meeting, Dec 12-16, Chicago, IL.



# Geological Society of America Presentations

- ❑ **Sansing, A., Godet, A., Sharpe, J., and Lacroix, B., 2022, The resilience of a northern Tethyan carbonate platform during the OAE1A: Geochemical insights from the Corbières region of France: Geological Society of America Abstracts with Programs, v. 54, no. 5, <https://doi.org/10.1130/abs/2022AM-378762>**
- ❑ **Price, D., Adams, T., Suarez, M.B., and Godet, A., 2022, Unusual preservation of dinosaur tracks during high frequency sea-level changes in the Glen Rose Formation (Albian, Early Cretaceous), Northern-Central Texas: Geological Society of America Abstracts with Programs, v. 54, no. 5, <https://doi.org/10.1130/abs/2022AM-380494>**
- ❑ **Godet, A., Byerly, J., Bourdon, M., Arnaud-Vanneau, A., Suarez, M.B., and Adatte, T., 2022, The demise of a subtropical carbonate platform during Aptian super greenhouse times: Geological Society of America Abstracts with Programs, v. 54, no. 5, <https://doi.org/10.1130/abs/2022AM-378728>**
- ❑ **Sharpe, J., Sansing, A., Suarez, M.B., and Godet, A., 2022, The response of Corbières carbonate platform to Early Cretaceous super greenhouse conditions: Geological Society of America Abstracts with Programs, v. 54, no. 5, <https://doi.org/10.1130/abs/2022AM-382672>**
- ❑ **Suarez, M., Cuellar, J., Snell, K., Godet, A., and Price, D., 2022, Paleoclimate and chemostratigraphy of the Hensel Formation, Kimble County, Texas: Geological Society of America Abstracts with Programs, v. 54, no. 5, <https://doi.org/10.1130/abs/2022AM-381823>**
- ❑ **Kulkarni, H.V., Varner, T., Malina, N., Ojeda, A., Alauddin, M., Johannesson, K. and Datta, S., 2022, Characteristics, Reactivity, and the Role of Natural Organic Matter (NOM) in Mobilizing Trace Elements of Health Concern in the Environment: Geological Society of America Abstracts with Programs**
- ❑ **Nordstrand, T., Felton, A., Kulkarni, H.V., Hutchinson, J., Gao, Y., and Ackley, S.F., 2022, Microplastics in large hailstones from two central Texas supercell thunderstorms: Geological Society of America Abstracts with Programs, v. 54, no. 5, <https://doi.org/10.1130/abs/2022AM-383621>**
- ❑ **Saunders Jr., R., Kulkarni, H.V., Kapayi, K., Marcantonio, F., Bertetti, F.P., and Datta, S., 2022, Trends in groundwater quality of the Edwards Aquifer and potential impacts of changing land usage: Geological Society of America Abstracts with Programs, v. 54, no. 5, <https://doi.org/10.1130/abs/2022AM-380554>**
- ❑ **Datta, S., and Kulkarni, H.V., 2022, Functions of dissolved organic matter in various geochemical systems: Geological Society of America Abstracts with Programs, v. 54, no. 5, <https://doi.org/10.1130/abs/2022AM-383575>**
- ❑ **Emerson, A., Gallo, R., Halverson, B., Lira, J., Shea, T., and Whittington, A., 2022, Calorimetric determination of lava crystallinity: The fissure 17 flow, Kīlauea 2018: Geological Society of America Abstracts with Programs, v. 54, no. 5, <https://doi.org/10.1130/abs/2022AM-383315>**
- ❑ **Patridge, A., Morrison, A., and Whittington, A., 2022, Thermal, chemical, and rheological analysis of lunar highland simulants: Geological Society of America Abstracts with Programs, v. 54, no. 5, <https://doi.org/10.1130/abs/2022AM-379978>**
- ❑ **Bartels, D., Cly, C., Hernandez-Robles, A., Dr.Sargent, B., Speck, A.K., and Whittington, A., 2022, Synthesis and characterization of alumina oxides as star dust analogs: Geological Society of America Abstracts with Programs, v. 54, no. 5, <https://doi.org/10.1130/abs/2022AM-379807>**



Ashley Emerson presenting her Calorimetric determination of lava crystallinity: The fissure 17 flow, Kīlauea 2018 poster at GSA 2022.

# Geological Society of America Presentations

- ❑ **Aguilar, A.,** Rampe, E., **Kulkarni, H.V., Datta, S., Godet, A.,** and Li, Y., 2022, Effect of low- and high-enthalpy geothermal temperatures on arsenic and fluoride leaching within the independence basin aquifer system, Mexico: Geological Society of America Abstracts with Programs, v. 54, no. 5, <https://doi.org/10.1130/abs/2022AM-383079>
- ❑ **Kulkarni, H.V., Datta, S.,** and Lopez, F., 2022, Using microbial sulfate reduction for improving brackish groundwater desalination: Geological Society of America Abstracts with Programs, v. 54, no. 5, <https://doi.org/10.1130/abs/2022AM-383512>
- ❑ **Banerjee, P., Kulkarni, H.V.,** Nagaraja, T., Krishnamoorthy, R., Das, S.R., and **Datta, S.,** 2022, Influence of organic and inorganic chemistry on soil phosphorus mobilization: Geological Society of America Abstracts with Programs, v. 54, no. 5, <https://doi.org/10.1130/abs/2022AM-383600>
- ❑ **Halverson, B., and Whittington, A.,** 2022, Rheologic investigation of one- and two-phase systems as initial constraints on viscosity of the Ahu'aliā'au flows of the Kīlauea 2018 eruption: Geological Society of America Abstracts with Programs, v. 54, no. 5, <https://doi.org/10.1130/abs/2022AM-382119>
- ❑ Baur, J., Lev, E., Birnbaum, J., **Halverson, B.,** Dietterich, H., **Whittington, A.,** Hammer, J., Llewellyn, E.W., and Drignon, M., 2022, Special and temporal variability of the 2018 Kīlauea lower east rift zone Ahu'aliā'au fissure lava flow: Geological Society of America Abstracts with Programs, v. 54, no. 5, <https://doi.org/10.1130/abs/2022AM-383992>
- ❑ **Whittington, A.,** 2022, What brittle structures can tell us about the emplacement of silica lava flows and domes: Geological Society of America Abstracts with Programs, v. 54, no. 5, <https://doi.org/10.1130/abs/2022AM-383791>
- ❑ **Hollan, S., Kulkarni, H.V.,** Medley, J.J., Hathaway, J. J.M., Phillips-Lander, C., **Northup, D.,** and **Datta, S.,** 2022, Impacts of wildfire on volcanic (lava tube) cave water chemistry: Geological Society of America Abstracts with Programs, v. 54, no. 5, <https://doi.org/10.1130/abs/2022AM-383106>



Brenna Halverson presenting her talk on Rheologic investigation on the Ahu'aliā'au flows of the Kīlauea 2018 eruption at GSA 2022.



Lauren Schwartz presenting her talk on Relating thermal inertia of basaltic lava flows to their texture at GSA 2022.

- ❑ **Schwartz, L., and Whittington, A.,** 2022, Relating thermal inertia of basaltic lava flows to their texture: Geological Society of America Abstracts with Programs, v. 54, no. 5, <https://doi.org/10.1130/abs/2022AM-382627>
- ❑ **Varner, T., Kulkarni, H.V.,** Kwak, K., Nguyen, W., Cardenas, M.B., Knappett, P. S.K., and **Datta, S.,** 2022, Impact of fluctuating river levels on sedimentary arsenic mobilization along the dynamic surface water-groundwater interface of the Meghna River, Bangladesh: Geological Society of America Abstracts with Programs, v. 54, no. 5, <https://doi.org/10.1130/abs/2022AM-382948>

# Conference Sessions Convened

- ❑ International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI): session 13H "From lava flows to pyroclasts: silicic volcanism and effusive-explosive transitions" (convenors: Graham Andrews, Rebecca Carey, Stuart Kenderes, Hugh Tuffen, **Alan Whittington**) 2023.
- ❑ Geological Society of America GSA Connects: session D41 "Recent Advances in Igneous Petrology and Volcanology" (convenors: Amanda Clarke, **Alan Whittington**) 2022.
- ❑ Topical Session: Arsenic, Fluoride, and Other Geogenic Contaminants in Groundwater: Advances in Application of Data Science, Machine Learning for Risk Assessment and Monitoring for Sustainable Mitigation of Associated Health Hazards. GSA 2023. (convenors: **Saugata Datta**)
- ❑ Topical Session: Characteristics, Reactivity and Role of Natural Organic Matter (NOM) in Elemental Cycling in the Environment. GSA 2023. (convenors: **Harshad V. Kulkarni, Tom Varner, Saugata Datta**)
- ❑ Frijia, G., **Godet, A.**, and Bomou, B. (2023). Shallow-water carbonates: archives of major paleoenvironmental and paleontological crises during the Phanerozoic. 36th Meeting of Sedimentology, 12-16 June 2023, Dubrovnik, Croatia
- ❑ **Curry, B., Godet, A., Sansing, A., Emerson, A., Aguilar, A., Patridge, A., Halverson, B., Bartels, D., Carmona, E., Kulkarni, H.V., Sharpe, J., Malesky, L., Schwartz, L., Torres, N., Klitus, N., Saunders Jr., R., Datta, S., Buck, S., Hollan, S., Barker, T., Varner, T., Lane, C., and Veiga, J.** attended the Geological Society of America Connects on October 9<sup>th</sup>-12<sup>th</sup> in 2022.



A group photo by the UTSA table at the GSA Connects 2022 conference in Denver, Colorado.

# Invited Lectures & Outreach

- ❑ **Cannon, M.**, May 2023, An interview about the [Laramide orogeny in Big Bend for Marfa Public radio](#).
- ❑ **Cannon, S.**, March 2023, "Your Journey is Your Own" UTSA Women in STEM. A motivational presentation to inspire young COS women by sharing my career journey.
- ❑ **Cannon, S.**, April 2023, "Day of Service Induction Speech" for Sigma Gamma Epsilon. A motivational presentation to inspire SGE members to give back to the community.
- ❑ **Datta, S.**, May 2023, San Antonio, TX. Innovations in Data Analytics for Smart Agriculture (iDASA) Workshop
- ❑ **Gao, Y.**, March 2023, Flinders University, National Center for Groundwater Research and Training, Integration of water quality, groundwater flow, and contaminant transport models to track sources, fate, and transport of nitrate in karst watersheds, central Texas.
- ❑ **Gao Y.**, April 2023, University of Melbourne, School of Geography, Earth and Atmospheric Sciences, Environmental Reconstruction and the Terrestrial Paleoclimate Record from Eastern North America: 600,000 years BP to Present.
- ❑ **Godet, A.**, October 2022, An overview of Sedimentary Rocks. Guest lecture, University of Paris Saclay.
- ❑ **Xie, H.**, June 2022, An invited seminar talk in University of Calgary (Canada) on Antarctic sea ice thickness and volume changes from remote sensing observations.
- ❑ **Xie, H.**, January 2023, An invited workshop to the University of Concepcion (Chile) on Introduction of ICESat/ICESat-2 and cloud-based ICESat-2 data processing and applications.

## Outreach:

- ❑ Elrod Elementary School Visit: Presented the rock cycle, dinosaur tracks, and volcanoes to 3rd, 4th, and 5th graders.
- ❑ Gonzalez Elementary School Visit: Presented earth science related activities to 3rd and 4th graders.
- ❑ John Jay High School STEM Fest: Open community forum for a chance to talk with the local community and John Jay high school students.

# Degrees Awarded

## Fall 2022 BS

- Dylan Ashwood, BS-Geosciences
- Kayla Bishop, BS-Geosciences
- Emmanuel Ovuegbe, BS-Geosciences
- Kaitlyn Tillery, BS-Geosciences
- Mallory Wilkins, BS-Geosciences

## Fall 2022 MS

- Andrea Mazzeo, MS-Geosciences
- Daniel Mathura, MS-Geoinformatics
- Iyare Oseghae, MS-Geoinformatics
- Faith Goddard, MS-Geosciences, A Geochemical Comparison of Three Large Edwards Aquifer Springs at Comal Springs, Texas. (supervised by Yongli Gao)
- James Django Doster, MS-Geosciences, Investigating Groundwater Between the Upper and Middle Trinity Aquifers in Central Texas. (supervised by Yongli Gao)

## Spring 2023 MS

- Tomas Fernandez, MS-Geoinformatics
- Samuel Oseji, MS-Geosciences, Elemental geochemistry and organic carbon content in the Boquillas Formation, West Texas. (supervised by Alexis Godet)
- Alexis Sansing, MS-Geosciences, The resilience of a northern Tethyan carbonate platform during the OAE1a: Geochemical insights from Corbières, France. (supervised by Alexis Godet)

## Spring 2023 PhD

- YoungHyun Koo, PhD in ESE, Using ICESat-2 satellite altimetry data to improve understanding of thermodynamic and dynamic sea ice characteristics in the Ross Sea, Antarctic. (supervised by Hongjie Xie)

# Certificates Awarded

## Fall 2022

- Jamie Gillis, Professional Certificate in Geographical Information Science

## Spring 2023

- Aaron Acosta, Professional Certificate in Geographical Information Science
- Dylan Ashwood, Undergraduate Certificate in Geographical Information Systems
- Brianna Bocook, Professional Certificate in Geographical Information Science
- Madasun Korst, Undergraduate Certificate in Geographical Information Systems

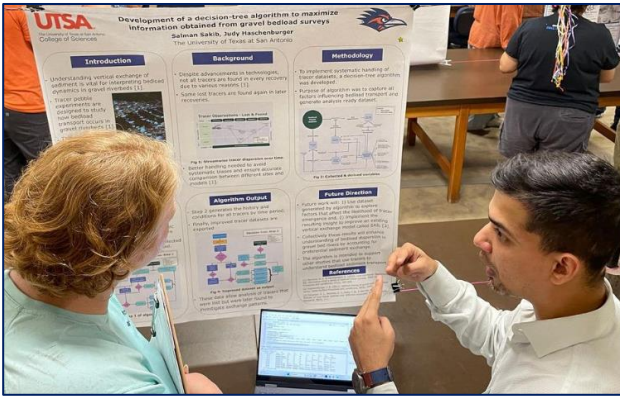
CLASS OF 2022 & 2023



YoungHyun Koo and his advisor, Hongjie Xie at Young's ESE hooding ceremony

# CONGRATULATIONS!

# Department's Activities



Salman presenting his poster to Heidi on Earth Day



Ross and Daniela talking to future students at the April UTSA Day



Steven, Protik, and Ronny giving tours of the labs on UTSA Earth Day



Sandy Cannon, Alex Godet, and Dianna Price at John Jay High School



Wyatt and Corrinne talking to future students at the March UTSA Day



Matt Cannon instructing students at Gonzalez Elementary School



Alan Whittington, Ashley, Lauren, and Matt Cannon demonstrate explosive volcanism to 4th grade students at Henry B Gonzalez Elementary School



The Earth Day poster presentation, where Corrinne won the first-place Graduate student prize, and Austin won the first-place Undergraduate student prize.

# Department's Activities



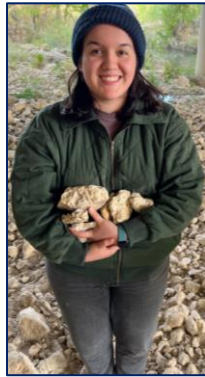
SGE induction for Fall 2022 where Austin, Cassidy, Melissa, Yakira, and Savannah became members.



SGE induction for Spring 2023 where Wyatt, Adam, Kelsey, and Tanner became members.



Izzy, Lauren, Austin, Melissa, Jaida, and Corrinne on a fossil hunt at UTSA



Melissa, Lauren, Austin, Izzy, Corrinne, Atlas, Ashley, and Ross on a fossil hunt with SGE



Cassidy, Ross, Ashley, Daniela, and Tiffany at the AEG booth.

Jaida and her fossil finds



Daniela, Chapter President of AEG, taking a selfie with a Mammoth skull replica.



AEG at Waco Mammoth National Monument



Ross with the skeleton of a 60,000yr old endemic camel in Waco.

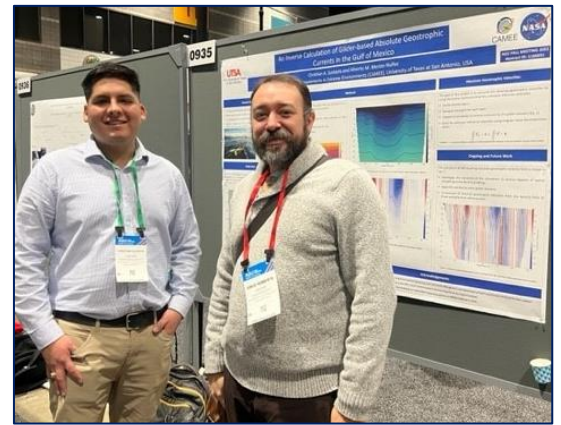


All the officers of AEG; Daniela, Ross, Sophia Ashley, and Cassidy.

# Department's Activities



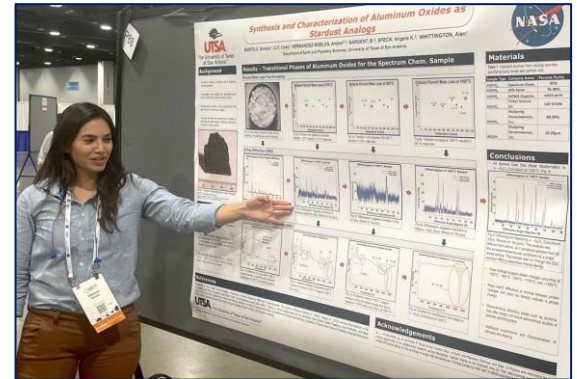
Alberto Mestas-Nuñez and Jordyn Sloan presenting a poster at AGU



Christian Sustayta, left, at AGU presenting his poster



Lauren and Austin at GSA 2022 meeting the creator of mindat.org, Jolyon Ralph.



Daniela Bartels presenting her research at GSA 2022.



Alex Godet, Dr. Bloxson, Maria Rodriguez, and students from Stephen F. Austin University at the IBA competition.



Brenna, Brian, Ronny, and Alex Godet running the UTSA booth at GSA 2022.

“The IBA competition was a great experience and gave us a good overview of the oil and gas industry, allowing us to work with real data. Being part of a joint team with SFAU and UTSA was a great success but challenging due to the distance when coordinating schedules and tasks via online. I encourage the master's students of the next semesters to join for the following year, it is a great learning opportunity.”

-Maria Rodriguez



Sophia Buck and Daniela Bartels at the Fiesta of Gems Show representing UTSA.

# Geo Moments



Crevasse with rolling rocks on top in the Andes glaciers (Chile).



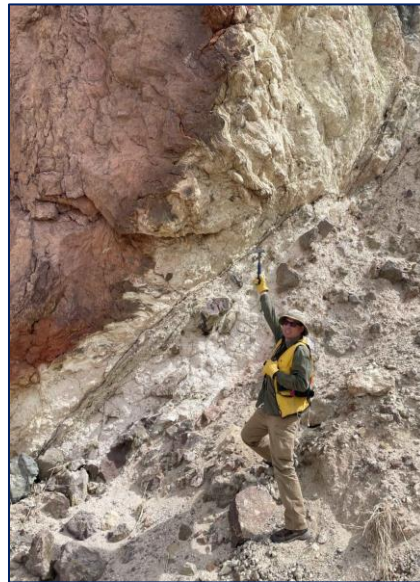
Morning hiking to the Andes glacier in Chile with Hongjie Xie and his team.



Korei Patterson working with a rock saw in the rock lab for her project.



Tom Varner collecting samples along the Beas River in India.



Doctoral student Tom Nordstrand (MS, 2022) at the margin of the Weston Caldera, west Texas.



Alan Whittington in front of the 400m thick  $\sim 26 \text{ km}^3$  Chao dacite coulée in the Atacama desert, Chile.



Petrology class field trip to Enchanted Rock, March 2023.



Melissa, Lauren, Cassidy, Olive, Jaida, and Nathan on a rock at the Enchanted Rock Field Trip, March 2023.



# Geo Moments



UTSA's Blake Weissling (on ladder), Dr. Angela Lombardi, and Dr. James Mason of the National Park Service inspect the Cliff Palace at Mesa Verde.



Students using their geology skills at summer field camp in Montana



Ruben collecting water samples in Eagle Pass



Students visiting the Ernst Tinaja; the Boquillas formation at Big Bend

The camp site of Hongjie Xie in the Andes glaciers.



"I really valued the opportunity to exercise our classroom conceptual studies in the field with a real-world geological scenario when mapping the Dagger Flat area in Big Bend. I think it really helped me understand the processes and connect our learning with the practice and the side trip swimming in the Rio Grande was a nice refresher after some long days in the field."  
-Larry Estrada, CPhT.



Structural Geology class at Big Bend National Park.



Structural Geology class at Big Bend National Park taking notes in the field.

"The field experience at Big Bend was a unique adventure that I feel fortunate to have participated in. The ability to learn and investigate such an extraordinary and vast location is one to be admired. This field experience expanded student limits, encouraged adventure, established comradery, and ignited a sense of wonder."  
-Korei Patterson

# Geo Moments



Quy Fung and Lauren Malesky detecting radioactive minerals.



Petrology class at Enchanted Rock examining en echelon fractures



Joshi, Mansi - Lake depth and ice thickness estimations using ICESat-2, Presented at Sea Ice School, Nunavut Canada (May 2022)

Phoenix and Zach taking a strike and dip and taking notes in Big Bend National Park on the Spring Break trip



Austin Patridge "holding" a concretion at Dino Ridge in Denver, Colorado



Alex Godet, Dianna, and Alexis visiting the dino tracks at Dino Ridge



View of a radar survey in a ceremonial kiva, conducted by Blake Weissling, assisted by Sara Rodriguez.



Saugata Datta's Aqueous Geochemistry class at the Edwards Aquifer Authority with Jessica Quintanilla and Alyssa Balzen.

# Social Links

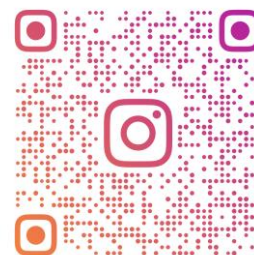


Website:

<https://www.utsa.edu/sciences/earth-planetary-sciences/>

Instagram:

[https://www.instagram.com/earthplanetarysciences\\_utsa/?igshid=YmMyMTA2M2Y](https://www.instagram.com/earthplanetarysciences_utsa/?igshid=YmMyMTA2M2Y)



EARTHPLANETARYSCIENCES\_UTSA



LinkedIn:

<https://www.linkedin.com/groups/8562033/>

Facebook:

<https://www.facebook.com/people/Dpt-of-Geological-Sciences-UTSA/100071330033166/>



SGE:

<https://rowdylink.utsa.edu/organization/sigmagammaepsilon>

AEG:

[https://rowdylink.utsa.edu/organization/aeg\\_utsa](https://rowdylink.utsa.edu/organization/aeg_utsa)



## Support our Students!

If you would like to make a donation to support our Department of Earth and Planetary Sciences students, faculty and research, please follow this link to the UTSA giving site.