



PRECOMMENCEMENT SPRING 2019 AND GEOPHYSICAL FIELD TRIP MAY 2019

Department of Geological Sciences Fall 2019

MILESTONES, ACCOLADES, AWARDS, GIVING

Department of Geological Sciences Milestones

The 2018-19 academic year began with the welcoming of **14** new graduate students with **8** MS Geology students, **6** PhD Geology students and **2** ESCI students. The Department of Geological Sciences is proud to report that our students have been successful in the past year as evidenced by scholarships, fellowships and internships. Below is a list of graduate students with their advisors in parentheses and their accomplishment.

Richard Alfaro-Diaz (Velasco)
- Los Alamos National Lab Postdoc, recent PhD graduate, Spring 2019

Julia Astromovich (Doser) –
Roswell Geological Society Scholarship, MS student

Jordan Caylor (Karplus) – AIPG Scholarship, PhD GEOL student

Jose (Tony) Garcia (Goodell) –
Internship Summer 2019,
Freeport McMoRan, PhD student

Victor Garcia (Ma) – Diana Natalicio Dissertation Fellowship Spring 2020 and Summer 2019 internship with Freeport McMoRan corporate office, PhD student

Evey Gannaway (Giles) – Diana Natalicio Dissertation Fellowship (Spring 2019), recent PhD graduate Spring 2019.

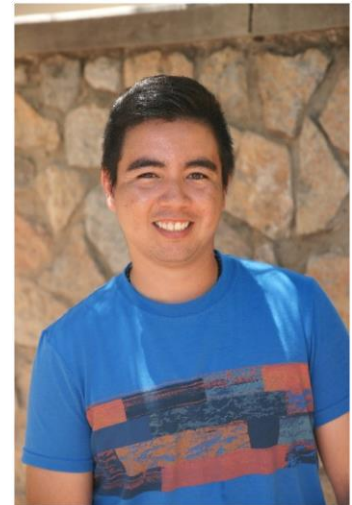


Drs. Katherine Giles and Evey Gannaway (Diana Natalicio Dissertation Fellowship awardee 2019).

Garrett Goff (Ricketts) – SIPES scholarship 2019, MS student

David Guenaga (Velasco) –

David is a SMART DoD fellowship recipient with a guaranteed civilian position with the DoD upon graduation. He is also an



Victor H. Garcia Diana Natalicio Dissertation Fellowship awardee Spring 2020.

Oak Ridge National Lab intern for Summer 2019 and recent MS graduate and current PhD student.



David Guenaga, SMART DoD fellowship recipient.

<https://www.utep.edu/newsfeed/campus/UTEP-PhD-Student-Awarded-with-Department-of-Defense-SMART-Scholarship.html>

Sergio Macias (Goodell) – internship Freeport McMoRan Summer 2019, MS student

Manuel Moncada (Doser) – White Award (Geography award), PhD student

Carlos Reyes (Pennington) – Natalicio Environmental Internship Summer 2019, MS ESCI student

Jacoup Roiz (Ricketts) – Natalicio Environmental Internship Summer 2019, local EPA office, MS GEOL student

Special recognitions go to **Amanda Labrado** (left) who received a NASA NESSF award for her PhD research with **Ben Brunner** on “*Microbial native sulfur formation in the subsurface without oxygen*” and **Marisol Dominguez** (right) who was awarded an NSF Graduate Student Fellowship to work with Hugo Gutierrez on “*Global Analysis of the Hydrologic Sensitivity to Climate Variability using a Budyko Approach*”.



At the 2017-18 UTEP Graduate student research EXPO Master’s student in Environmental Science, **Julio Cenicerros** (Advisor:



Julio Cenicerros

Tom Gill) received the first place poster award for his poster *Identifying the Abundance of Soil, Vegetation, and Rock Using*

Multiple Endmember Spectral Mixture Analysis (MESMA) in Texas, New Mexico and Oklahoma.

Ezequiel Moreno Flores (Advisor: Jie Xu) was awarded the Geological Society of America Graduate Student Research Grant for his work: *Crystal Structural Variations of Abiotic and Biogenic Iron Sulfide Nanoparticles: Effect of Formation Environments’ Redox Conditions.*



Ezequiel Moreno Flores

Undergraduate Research

Guadalupe Alvarez was recognized for her Outstanding Student Paper at the December 2017 American Geophysical Union meeting in New Orleans.



Guadalupe Alvarez

This is a high honor for any student, but it is especially notable because Guadalupe is an undergraduate student working with Hugo Gutierrez. She graduate in May 2019 and has applied to graduate school at the University of Canberra (Australia).

Undergraduate **Amaris Bustamante** received the James H. & Minnie Edmonds UTEP

Presidential Scholarship and the Texas Grant.

Angela Trejo, an ESCI undergrad, was a recipient of a PEP Woods Hole summer internship.

The **Geology Field Experience Fund** was awarded to: Alex Eddy, Zach Fleming, Tony Garcia, Garrett Goff, Amanda Labrado, Anna Mwangi, Mohan Pant, Josh Peterson, Patrick Rea, Tai Subia, Ivy Trevizo, and Felix Ziwu.

The department is looking forward to the many great research and internship experiences for the UTEP Geoscience undergraduates in the Summer and Fall.

Faculty Achievements

UTEP Geological Sciences is very excited about the upcoming arrival of our newest faculty member Dr. Antonio Arribas. He takes the Kenneth & Patricia Clark Distinguished Chair position funded last year by alumnus Allen Gilmer (founder of Drilling Info Inc.). Most recently, Dr. Arribas has been a faculty member at Akita University (Japan), and he has had high-level positions with Newmont Mining Corporation, BHP Billiton Minerals Exploration and Placer Dome Exploration Inc. Antonio is highly recognized in



Dr. Antonio Arribas.

the field of economic geology as evidenced by his serving as President of the Society of Economic Geologists in 2013. Antonio extends our expertise in the Center for Entrepreneurial Geosciences and will increase our contacts with industry and science in South America.

Dr. Diane Doser was named a Geological Society of America Fellow to be recognized at the annual meeting in Phoenix AZ, September 22-25, 2019. "Dr. Doser has made numerous contributions to earthquake seismology including source

mechanics in the western US, Alaska, New Zealand and East Africa" said Kevin Mickus, professor at Missouri State University and alumni of UTEP.



Dr. Doser: A Geological Society of America 2019 Fellow, nominated for her significant contributions in earthquake seismology and her advocacy for a strong geophysics presence at GSA meetings.

Dr. Marianne Karplus, Galen Kaip and Dr. Steven Harder are part of the team that received the NSF Polar Programs grant "Thwaites Interdisciplinary Margin Evolution (TIME): The Role of Shear Margin Dynamics in the Future Evolution of the Thwaites Drainage Basin."

Researchers from UTEP's Department of Geological Sciences are part of an international team participating in a multimillion-dollar, joint research program between the United States and the United Kingdom that seeks to understand how quickly a massive Antarctica glacier could collapse.

Research Funding

In grants totaling over \$2,600,000 the following faculty research was initiated and ongoing:

- T.E. Gill Regional dust forecasting for Valley Fever surveillance, highway accident prevention, and air quality management in the Southwestern U.S. NASA \$58,833 11/16/18 to 11/15/21
- T.E. Gill and R.P. Langford Acquisition of Laser Diffraction Particle Sizing System for Research and Research Education on Earth, Environmental, and Atmospheric Boundary Layer Processes and Materials; DoD \$107,825 3/7/19-3/6/20
- Deana Pennington, Walker, Hargrove, Santiago, Archuleta, Cappelle *Engineering Research Center for One Water*. NSF. \$100,000.
- *SWIM to a Sustainable Water Future*. PI: Natalia Villanueva (Computer Science). NSF \$599,451
- James Kubicki with PI Kate Freeman (Penn State) and others *The origins of molecules in diverse space and planetary environments and their intramolecular isotope signatures*. NASA \$612,000 to UTEP
- Lin Ma with PIs at University of Arizona *MRI: Acquisition of a noble gas multi-collector mass spectrometer for geochronology and geochemistry research*. NSF. \$880,000
- Tom Gill & Lixin Jin *Quantifying land surface properties for mitigating blowing dust impact on highway safety at Lordsburg Playa, New Mexico*. U.S. Department of Transportation \$57,380
- Marianne Karplus, Diane Doser, Stephen Veitch *Investigating West Texas Seismicity and Structure with Dense Geophone Arrays*. State of Texas, \$194,974

Also, over 64 publications were generated by faculty from 4/18 to 4/19, a sampling of which are:

Muammar Mansor, Debora Berti, Michael Hochella, Mitsu Murayama, Jie Xu (2019) Phase, morphology, elemental composition, and formation mechanisms of biogenic and abiogenic Fe-Cu-sulfide nanoparticles: A comparative study on their occurrences under anoxic conditions. *American Mineralogist*, 104 (5), 703-717.
Biddle, J., Ricketts, J.W., and Amato, J.M., 2018, Constraining timing of extension in the southern Rio Grande rift and Basin and Range using apatite and zircon (U-Th)/He thermochronology, in Mack, G.H., Hampton, B.A., Ramos, F.C., Witcher, J.C., and Ulmer-Scholle, D.S., eds., *Las Cruces Country III: New Mexico Geological Society, Guidebook 69*, p. 127-135.

Hiebing, M.*, Doser, D. I., Avila, V.*, Ma, L. (2018), Geophysical studies of fault and bedrock control on groundwater geochemistry within the southern Mesilla Basin, west

Texas and southern New Mexico. Geosphere, Doi:10.1130/GES01567.1

Karplus, M.S., Klemperer, S. L., Zhao, W., Kind, R., Wu, Z., Mechie, J., Shi, D., Brown, L. D., Chen, C., Su, H., Xue, G., Sandvol, E., Ni, J., Tilmann, F. J., Chen, Y. J. (2019), Receiver-function imaging of the lithosphere at the Kunlun-Qaidam boundary, Northeast Tibet, *Tectonophysics*, 759, pp. 30-43, doi: 10.1016/j.tecto.2019.03.015.

Sullivan, P.L., Godd ris, Y., Shi, Y., Gu, X., Schott, J., Hasenmueller, E. A., Kaye, J., Duffy, C., Jin, L., and Brantley, S. L. Exploring the Effect of Aspect to Inform Future Earthcasts of Climate-Driven Changes in Weathering of Shale. *Journal of Geophysical Research: Earth Surface*, 124 (4): <https://doi.org/10.1029/2017JF004556>

Young, K.E., Bleacher, J.E., Rogers, A.D., Schmitt, H.H., McAdam, A.C., Garry, W.B., Whelley, P.L., Scheidt, S.P., Ito, G., Knudson, C.A., Graff, T.G., Bleacher, L.V., Whelley, N., Evans, C.A., **Hurtado, J.M.(Jr.)**, and Glotch, T. D., 2018, The Incorporation of Field Portable Instrumentation Into Human Planetary Surface Exploration: Earth and Space Science, vol. 5, <https://doi.org/10.1029/2018EA000378>

Uuh-Sonda J., Guti rrez-Jurado H.A., Mendez-Barroso L., Figueroa-Espinoza. 2018. On the Ecohydrology of the Yucatan Peninsula: Evapotranspiration and Carbon intake dynamics of deciduous and evergreen tropical forests of the Yucatan Peninsula under climatic extremes. *Hydrological Processes*, doi: 10.1002/hyp.13230.

Richter, D. and Gill, T., 2018. Challenges and opportunities in atmospheric dust emission, chemistry, and transport. *Bulletin of the American Meteorological Society*, 99(7), pp.ES115-ES118.

Doser, D., M.A. Ornelas*, I. Martinez*, L. Jin, A. Ortiz* and G.M. Kaip, Using geophysics to investigate

texture and salinity of agricultural soils and their impact on crop growth in El Paso, County, Texas, accepted, *J. Envir. and Engineer. Geophys.*, June 2019.

Chaput, J., Oliver, G., Borchers, B., (2018), Using supervised machine learning to improve active source signal retrieval, *Seismological Research Letters*, 89 (3), pp. 1023-1029.

Labrado, A.L., B. Brunner, S.M. Bernasconi, J. Peckmann. Formation of large native sulfur deposits does not require molecular oxygen. *Frontiers in Microbiology*, 10. 2019

Gholamy, A., Parra, J., Kreinovich, V., Fuentes, O. and Anthony, E.Y. (2019) "How to Best Apply Deep Neural Networks in Geosciences: Towards Optimal "Averaging" in Dropout Training". In: *Smart Unconventional Modeling, Simulation and Optimization for Geosciences and Petroleum Engineering*, Springer Verlag.

Kubicki J.D., Watts H.D. (2019) Quantum mechanical modeling of the vibrational spectra of minerals with a focus on clays. *Minerals*, 9, 141; doi:10.3390/min9030141.

2019 UTEP Imperial Barrel Award



Imperial Barrel Award (IBA) team: from left, Jenna Faith, Jordan Caylor, Derek Scott, Hanah Bayer-Draper and Julia Astromovich.

The Department of Geological Sciences is proud to report that the IBA team competed in the Southwest Section IBA 2019 Semifinal competition in (Dallas), TX on March 30, 2019.

The team was made up of Ph.D. students **Jenna Faith** and **Jordan Caylor** and M.Sc. students, **Derek Scott**, **Hanah Bayer Draper**, and **Julia Astromovich**, mentored by **Dr. Rip Langford**.

Highlights from our student led Colloquium 2019:

"E4: Earth, Energy, Environment, Everyone"

Keynote speaker Anthony Salem – Shell Oil

SPONSORS



James Cearlev



Larry Franceware



Royal Dutch Shell Participants

POSTER WINNERS

Ariana De La Hoya 1st Place Undergraduate - Diet Assessment of New Zealand Grey Ducks and the Invasive Mallard

Miranda H. Miranda 2nd Place Undergraduate - High Ozone

Episode in the Paso Del Norte Region

Nikki Donegan 3rd Place
Undergraduate - Urban Dipteran Diversity in the Desert Southwest

Emmanuel Sosa 1st Place
Graduate - A Quantitative Assessment of the Presence and Mobility of Trace Metals in Soils and Groundwater

Alondra Soltero 2nd Place
Graduate - Top Salt Synclines in the "Post Diapiric" Jurassic Morrison Formation, Big Gypsum Valley, Colorado

Julia Astromovich 3rd Place
Graduate - Using Gravity Methods to Identify a Salt

Shoulder of the Onion Creek Salt Diapir, Utah

Meagan Trainham 1st Place EPCC student - Rockfall Hazard on Transmountain

PRESENTATION WINNERS

Amanda Labrado 1st Place - Deciphering Istopes of Elemental Sulfur at Caprock from Damon Mound, TX Temperature of a Dynamic Microbial Subsurface Environment

Victor H. Garcia 2nd Place - Hydrogeochemistry of Travertine Depositing Springs near the Santa Fe Fault in Laguna, New Mexico

Claire Bailey 3rd Place - Fluvial Facies Distribution of the Jurassic Salt Wash Member of the Morrison Formation Around the Gypsum Valley Salt Diapir.

2019 UTEP Imperial Barrel Award

SEMINARS

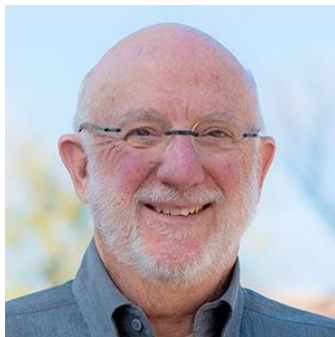
The Department of Geological Sciences sponsors a seminar series every semester that includes scientists and professionals from industry from around the world. These seminars are typically every Monday at 3:30pm in Rm 123 of the Geological Sciences Building, all are welcome. A snapshot of some of the presenters this year is mentioned below.



Lewis Teal – Seminar 10/8/18
Exploration and Mining at Lewis Teal CPG, Inc.

Group Executive South American Exploration and Development
Director South America Generative Exploration
Exploration Manager Newmont – Minera Yanacocha Operations
Chief Geologist – Newmont, Minera Yanacocha

M. Stephen Enders – Seminar 11/19/2018 - Professor and Department Head, Geology & Geological Engineering – Colorado School of Mines, Head of worldwide exploration for Phelps Dodge Exploration Corp and most recently as Senior VP for Newmont.



NSF SITE VISIT

In September, NSF's Earth Sciences Division sent a contingent of program managers to visit UTEP's Geological Sciences to share information about programs and hear from of us. All went great, but rather than my description, here is a quote from the organizer.

"I would like to begin by saying that everyone from the NSF team had a wonderful morning at your university. I can only speak specifically to the student group, but Justin, Alicia and I were incredibly impressed with their interests and engagement in our session."

Mia Thomas 09/14/2018
NSF Division of Earth Sciences

AWARDED DEGREES

31 undergraduate degrees awarded in 2018-2019

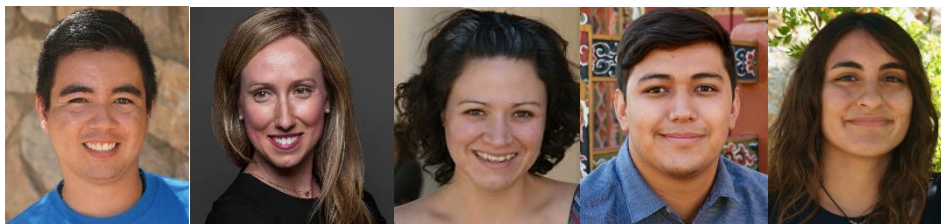
22 graduate degrees awarded in 2018-19

Giving

We are exceptionally grateful for the continued support of generous donors from funds (\$47,850 Total) encompassing the following:

Kenneth F. and Patricia Clark Distinguished Chair
The Bruce Davidson Memorial Graduate Student Award Fund
Dr. John M. Hills Memorial Fund in Geology
Vernon G. and Joy Hunt Endowed Scholarship Fund in Geology
Verna O'Neill and Helen Lawrence Indio Mountains Research Station Endowment Fund
Dr. William N. McAnulty Endowed Memorial Fund in Geological Sciences
W. P. Nash Scholarship Fund
Lloyd A. Nelson Professorship in Geology
Dr. Howard E. Quinn Memorial Fund
Reese Rowling Endowed Fund for Geology
D. B. Smith Memorial Scholarship Fund
William S. Strain Geology Fund
Haigh-Sauer Fund
Thomas R. and Gigi G. Hancock Endowed Geophysics Scholarship Fund
Dr. Earl Lovejoy Excellence Endowment
Roy S. and Helen Magruder Endowed Scholarship
Jim and Maureen Singleton Endowed Scholarship
UTEP Field Geology Experience Fund Endowment
Jim and Karen Handschy Endowed Scholarship
George B. McBride Graduate Fellows Endowment
Graduate Student Excellence and Mobility Endowment
Cearley Scholarship

These are some of the students that benefited from the generosity of these donors:



Pictured from left: Victor H. Garcia (PhD student), Rachele Kernen (PhD student), Amanda Labrado (PhD student), Nathan Reade (MS student) and Alondra Soltero (MS student).

In addition, the following students not pictured, benefited from the donor generosity: Juan Ochoa Chavez (Phd recipient), Lorraine Negron (PhD student), Hanah Bayer-Draper (MS student), and Garrett Goff (MS student).



The George B. McBride Graduate Fellows Endowment

I, **John S. Birkelbach**, on behalf of the **Richard G. Miller Memorial Foundation** ("Donor") hereby give **\$300,000** to the Board of Regents of The University of Texas System ("Board of Regents") to establish an endowment for the use and benefit of The University of Texas at El Paso ("University"), to be known as the **George B. McBride Graduate Fellows Endowment** ("Endowment").

The Endowment shall be a permanent endowment and shall be used for the benefit of the College of Science. Funds distributed from the Endowment shall be administered by the Chair of Geological Sciences to provide research fellowships to graduate students who are pursuing their graduate studies in Geological Science and who are U.S. Citizens or Permanent Residents. The recipients will be selected on the basis of their academic excellence, research, and leadership. Distributions from the Endowment shall also be used to support the enhancement of their research initiatives, forming a close-knit academic and collegial network with research mentoring provided by senior faculty members within their respective college.



Dean Kirken, John S. Birkelbach, Lucia Dura, and James Kubicki in front of the plaque on the Wall of Fame honoring the Richard G. Miller Memorial Foundation gift of \$300,000 to support graduate scholarships in the name of George B. McBride.

WORKSHOPS

Research Opportunities for Community College Students (ROCCS) 6/03/2019 – 7/01/2019

Dr. Diane Doser (UTEP) and Rob Rohrbaugh (El Paso Community College)

Seven community college students from across the U.S. visited the Department in June 2019 to participate in the NSF sponsored ROCCS (Research Opportunities for Community College Students) program. After spending an intensive 4 weeks learning about El Paso geology, formulating research plans and collecting data, they returned to their home institutions to complete their projects with guidance through virtual mentoring. All seven will attend the fall 2019 GSA meeting in Phoenix to present their results, as well as participate in a the AGU fall virtual poster session. Their research projects encompass structural, petrological, geophysical and stratigraphic studies related to the Eocene igneous intrusions of western El Paso (e.g. Campus andesite, Three Sisters). Three student mentors, including UTEP undergraduates Allison Bailleres-Emmett and Aimee Garcia, helped guide the community college students in their research, along with faculty mentors Diane Doser and Rob Rohrbaugh (El Paso Community College). Other geoscience faculty including Libby Anthony, Lixin Jin, Richard Langford and Jie Xu assisted in the research. We also congratulate Zenja Seitzinger, a 2018 ROCCS participant, who was awarded third place for best undergraduate poster in AGU's 2018 fall virtual poster session.



Research Opportunities for Community College Students (ROCCS) program participants at Mt. Cristo Rey.

Pathways 6/17/ to 6/28/2019

Dr. Aaron Velasco

Camp Coordinator: Dr. Azucena Zamora

Camp Leaders: Sandra Hardy, Frankie Enriquez, Lupita Alvarez, and Erik Urquidi

Funded by Shell Oil company and the National Science Foundation (through CREST PRF grant), the UTEP Pathways Geoscience Summer Camp builds a community of aspiring geoscientists in El Paso by establishing awareness of the geosciences among local high school students. The program is a two-week summer camp held on campus for high school students that exposes them to a variety of Geoscience topics and demonstrates their integration with biology, chemistry, physics, and computer science. This year's camp was held June 17-28, 2019 at the Geology Department.

Graduate camp leaders Sandra Hardy, Frankie Enriquez, Lupita Alvarez, and Erik Urquidi exposed students to field trips to Carlsbad caverns, the Rio Grande river, Rio Bosque park, Lost Dog trail, Scenic Drive, and the Franklin mountains led by Dr. Velasco, Dr. Veitch, Dr. Veilleux, Dr. Langford, and Dr. Zamora. Throughout the camp, students had fun learning about the careers available at the Geology department while learning about the El Paso's geological setting and its important landmarks.



Students: Marlyn Aguero, Edith Alvarez, Joseph Arteaga, Jorge Benitez, Robert Dominguez, Javier Garcia, Alan Garcia, Frida Garcia, Andres Ibarra, Bryan Magallanes, Leslie Medina, Cynthia Mendoza, Amy Ontiveros, Alexandra Perez, Luis Salinas, McKenzie Sutton, Lumidee Varela, and Maddy Zamora

Molecular Modeling 06/17 to 06/21/2019

Dr. James Kubicki

James Kubicki hosted students from Texas A&M, Penn State and Georgia State Universities from June 24 to 28 to learn techniques in computational geochemistry. (From L to R – Andrew Shaughnessy (PSU), Nadine Kabengi (GSU), Bademi Fashina & Youjoun Deng (TAMU), Dr. Kubicki, Faisal Adams & Sean Zigah (GSU))



Over the course of the academic year and to round out the end of the spring semester, we had a total of 22 graduate students who were awarded their degrees in Geology, Geophysics or Environmental Science. There were 31 bachelor's degrees awarded to students in Geology and Environmental Science from the undergraduate program.

Looking forward to another outstanding year as more students start to learn about their summer opportunities and make future plans after graduation!

James Kubicki, Chair, Department of Geological Sciences

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