

DEPARTMENT OF GEOLOGICAL SCIENCES

2024 NEWSLETTER

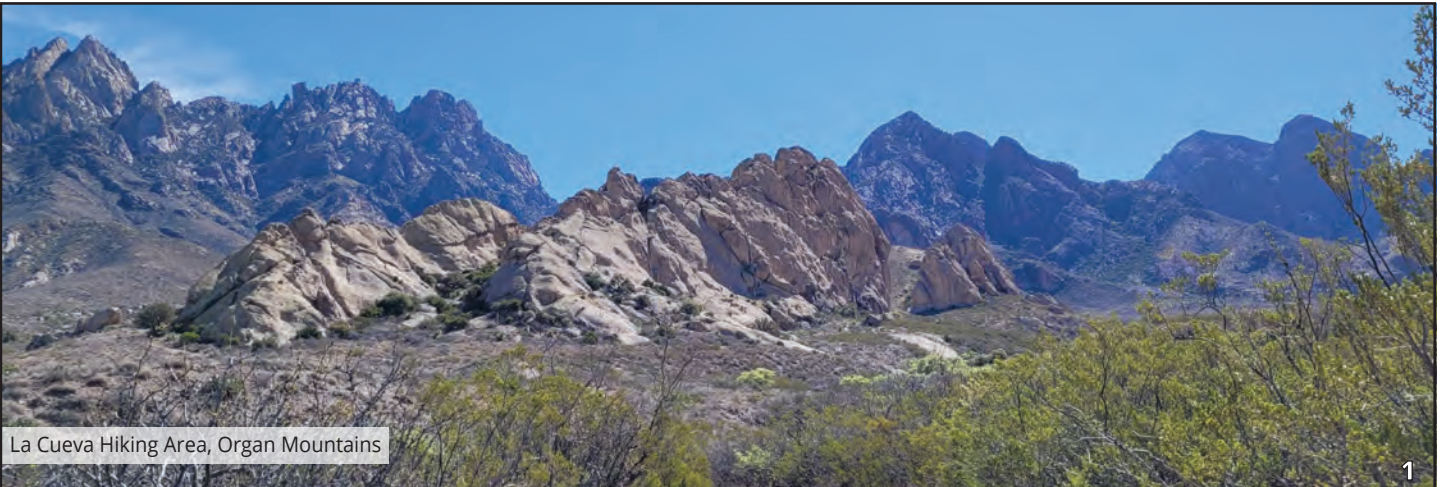
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Brian Hampton's GEOL 420 field trip to Broad Canyon, NM



Brian Hampton's GEOL 478/578 field trip to the Guadalupe Mountains



La Cueva Hiking Area, Organ Mountains

Meet Our Department

Erric Ferre, Department Head
Jeffrey Amato, Professor
Andrew Flynn, Assistant Professor (beginning Spring 2025)
Brian Hampton, Associate Professor
Nancy McMillan, newly retired Department Head (congrats!)
Frank Ramos, Professor
Tiffany Santos, Zuhl Collection Director
Jennifer Thines, Assistant Professor



Karen Hancock, Dept. Administrator



Jordan Bell, Office Assistant

2023 Homecoming Field Trip to Slot Canyon, eastern Robledo Mountains. This year's Homecoming is November 8-9 with a Saturday field trip to Aden Crater, Potrillo Volcanic Field



Congratulations to our recent graduates and successful defenses!

Undergraduate

- Katie Allbright
- Jesse Dorman
- Gideon Kuykendall

Graduate

- Marie Gibson, *Deciphering the Origin and Compositional Zoning in Watermelon Tourmaline*
- Lee Hughes, *The Uvas Basaltic Andesite: A Large-Volume Volcanic Field Erupted During the Initiation of the Southern Rio Grande Rift*
- Ronny Scholdt, *An Evaluation of Late Quaternary Slip Rates in the Southern Rio Grande Rift, New Mexico Using High-Resolution Photogrammetry*



MESSAGE FROM DEPARTMENT HEAD ERIC FERRE

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I joined the Department of Geological Sciences at New Mexico State University on August 1, 2024 and I am thrilled to take the helm after Dr. Nancy McMillan who recently retired. Dr. McMillan had a very successful career as a scientist and has many friends on our campus. I was born in France and had the pleasure of seeing the Pyrenees Mountains every day from my childhood bedroom. Needless to say, the view of the Organ Mountains has been a big part of my decision to come to Las Cruces, after spending 24 years of my previous life in "mountainless" and even swampy environments. This transition from Louisiana, where I had been Director of the School of Geosciences for 5 years, brings joy to my heart and I enjoy my interactions with our students and my colleagues and staff every day. Karen has been particularly helpful and has shared her institutional knowledge with me. We have re-established our presence on social media (LinkedIn, Instagram, X and FaceBook) so please follow us there. This first year our top two departmental priorities are undergraduate enrollment and research. All the faculty, staff and two of our students have been on the deck non-stop taking part in outreach and recruiting events.

I came to Las Cruces with a graduate student, Mr. Luke Horsu, who is making great progress on his MSc research on the Karoo mafic sills of South Africa. So yes it is an exotic project but it is fun and these sills are not too different from the mafic sills in Big Bend N.P. in Texas. Luke is working on magma flow in these sills using magnetic and geochemical methods to constrain magma transport in Large Igneous Provinces (LIPs). Another MSc student, Ms. Haley Benoit, did not move to Las Cruces because she was more advanced in her degree but I keep in touch with her through weekly Zoom meetings. Haley is working on some of the best fault pseudotachylytes (rocks produced by frictional melting along a fault plane) from Southern California. Her research focuses on the kinematics of frictional melts that lubricate the fault plane during seismic slip. The development of the rock magnetic lab is moving along with purchase orders, equipment donations and all sorts of physical rearrangements and it should be operational in January 2025 in Gardiner Hall. Our faculty is currently developing a new National Science Foundation Research Experience for Undergraduate students proposal focusing on the Southern Rio Grande Rift. On my side I am about to submit a small research grant to the Southern California Earthquake Center (fingers crossed). Next month, I will be presenting at the American Geophysical Union conference, some of my research on the rock record of oceanic (non-subduction) seismicity based on IODP cores from the Atlantic Ocean.

On a personal note, I am happy to report that I bought a new house between the Doña Ana and Organ Mountains. The house is so new that for a while it did not even have an address ... I have also learned (the hard way) about the goat heads in the area and my mountain bike does like them ... Of course being French, I enjoyed the hospitality and food of some of the best spots in Las Cruces / Mesilla including Double Eagle, Lescombe and Hacienda. I look forward to seeing you all at the Homecoming events and at the Reynolds Field Station.

My first three months have been a bliss thanks to many who have lend a helping hand to me and I am very grateful to them for that.

Jeffrey Amato

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I have been continuing my research on a plethora of projects including the Proterozoic history of New Mexico, Cretaceous magmatism in northern Alaska, the ages of mafic magmatism in the Rio Grande rift, and volcanism in the Mogollon-Datil volcanic field. Lee Hughes finished his thesis on the geochronology and geochemistry of the Uvas Volcanic field. Amit Millo has his thesis defense in early November. He discovered the first Precambrian fossils in New Mexico with his finding of stromatolites in the carbonate rocks of the Red Rock region of the Burro Mountains. Alexis Salmeron is still working in the Salinas Peak area of the San Andres Mountains. Emma Schantz has been studying the age of strata containing Tyrannosaur and Alamosaur fossils on Armendaris Ranch near Truth or Consequences.



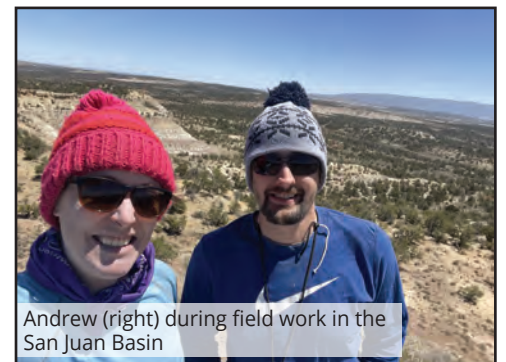
I am now working with three undergraduate students. Jordan Bell did U-Pb dating of a rhyolite that we thought was going to be Paleogene but ended up being Grenville (1.2 Ga) in age. Chad Pilkington is dating rift basalts in the Robledo Mountains. Joanie Keener is helping date another key Uvas Basalt. I am working towards improving our Social Media Accounts to keep in touch with alumni and advertise our department to prospective students.

The Amato family went to southern Africa this summer for two weeks and even though we didn't see any rocks, there was amazing wildlife and it was one of the best trips I have taken, and I've been to a lot of different parts of the world. I went to the Annual GSA Meeting in Anaheim in September and met alums Vanessa Swenton (MS '17), Sean Gaynor (MS '13), and Shay Ridl (MS '20).

Andrew Flynn

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I am very excited to be joining the NMSU Department of Geological Sciences this spring as an assistant professor! After completing my bachelor's degree in geology at Miami University, I attended Baylor University for my PhD, graduating in 2020, where I specialized in paleobotany, paleoclimatology, and magnetostratigraphy. After my graduate work, I was a postdoctoral fellow at the U. of Houston until 2023 and I am currently finishing my Peter Buck Postdoctoral Fellowship at the Smithsonian Institution National Museum of Natural History (NMNH).



My research is broadly focused on understanding how ancient terrestrial ecosystems responded to periods paleoclimatic and environmental change using a combination of paleobotanical, geochemical, and sedimentological methods. Much my current work has focused on the early Eocene terrestrial deposits in the San Juan Basin of northwestern NM. This past year, as part of my postdoctoral fellowship at the NMNH, I collected some of the first fossil plants from the early Eocene San José Formation. These deposits span one of the warmest intervals of the past 66 million years providing a deep-time analog for modern anthropogenic climate change. With these new collections, I will be able to reconstruct paleoclimate using the size and shape of fossil leaves and investigate how floral communities adapted to paleoclimate change. This work is part of a large, collaborative project with researchers from the U. of Minnesota, USGS, Colorado College, U. of Colorado, NM Museum of Natural History and Science, and the NMNH. I am also looking forward to collaborating with NMSU faculty and students at the Reynolds Field Station next spring.

I am ecstatic to be able to work in New Mexico and look forward to many years to come with NMSU faculty, students, and alumni.

Brian Hampton

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2024 found members of Hampton's Basin Research Lab in the field just about every month of the year and working on new and ongoing research projects as well as numerous class field trips! Our research this year was focused on a range of projects throughout the Desert Southwest. On the teaching front, Hampton has led field trips in 2024 to the Guadalupe Mountains, Marathon Mountains, and Big Bend, as well as a number of trips around southern New Mexico. Hampton spent much of the summer with graduate student, Thomas Valenzuela, developing a new field camp curriculum and projects for the upcoming 2025 NMSU Summer Field Camp that will take place for the first time at the Reynolds Field Station in west-central New Mexico. In addition to research and teaching, Hampton is serving as the outgoing Chair of the GSA Sedimentary Geology Division and outgoing President for the NM Geological Society as well as Director of the Southern Rift Institute at NMSU.



As always, a number of CONGRATULATIONS are due to present and past members of the research group. Graduate students Leo Kuyl and Nicole Salladin both spent the summer working internships at ExxonMobil and Chevron, respectively. Graduate student Thomas Valenzuela gave a research talk at ExxonMobil in late 2023. Thomas, Nicole, and Leo all presented research results at the 2024 GSA Annual Meeting in Anaheim, CA. The Basin Research Lab is excited to welcomed 1 new graduate student this fall (Katie Allbright)! On the alumni front, congrats to Cody and Sam Weis (2019) who welcomed new baby, Beau, into their family! Congratulations also to Shay Ridl (2020) and Lauren Roscizewki on their marriage and beautiful wedding that took place this past October.

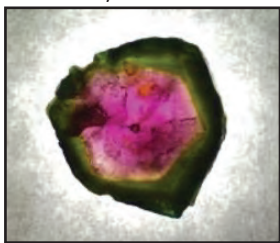
Finally, thank you to all our collaborators and current and past students in the research group through the years for making my job easy and amazing, and to everyone who made 2024 a great year!! I hope to see as many of you as possible on the rocks in 2025!!

Nancy McMillan

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Nancy McMillan retired from NMSU in July, 2024, after serving as professor for 35 years and department head for 17. She retired to do more science, continuing her research applying Laser-Induced Breakdown Spectroscopy to earth materials and processes, and working for Materialytics, a LIBS traceability company started by NMSU graduate Catherine McManus.

McMillan's research recently has focused on tourmaline. Her last graduate student, Marie Gibson, successfully defended her thesis on watermelon



tourmaline in September 2024. Marie combined LIBS, electron probe microanalysis, and XANES (X-ray absorption near edge structure) to understand the causes of the color variations in watermelon tourmaline (spoiler alert—it's as much about the oxidation state as it is about the elemental composition) and the processes through which the compositional zonations formed (open-system pegmatite evolution).



McMillan published two papers on tourmaline using LIBS analysis in 2024 with co-authors Drs. Barb Dutrow and Darrell Henry, Louisiana State University: A multivariate statistical approach for mineral geographic provenance determination using Laser-Induced Breakdown Spectroscopy and Electron Microprobe Chemical Data: A case study of copper-bearing tourmalines (*American Mineralogist*) and Laser-Induced Breakdown Spectroscopy analysis of tourmaline: Protocols, procedures, and predicaments (*European Journal of Mineralogy*). A series of papers on LIBS analysis of tourmaline is in the works.

An undergraduate scholarship was started to honor her contributions to the department; please consider a donation of any size. More information can be found on the donations page of this newsletter. Thanks!

Frank Ramos

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The Ramos research group continues moving forward. Dave Cheu, who grew up in El Paso, joined us this fall and is working on young Tonga eruptions including rocks from the 2022 eruption. In addition, Camila Mejia continues to analyze alkali feldspars from the Azores. Camila and I made it to the island of Sao Miguel in June for 10 days. We met up with Adrian Pimentel, our host, and Gary Michelfelder, another NMSU alum. We sampled three young volcanoes (Fogo, Furnas, and Sete Cidades). Camila was able to get two samples from Fogo and Furnas for her thesis work. We also collected samples for another MS project for Sete Cidades volcano. It was a great trip. Camila and I also visited Savannah River National Lab as part of a DOE group in August. We spent an afternoon at Georgia Tech meeting with colleagues and two days at the annual MSIPP meeting in Savannah River. We were able to tour Savannah River Nation Lab in Aiken, South Carolina and meet many employees.



On the alumni front, Jenelle Hansen is still working in Topeka, Kansas. She is doing radiation monitoring for the state and sharing an apartment with her penguin. Allison Mrotek, who graduated a year ago, was hired at Los Alamos and is working with Jacob Buettner in Wil Kinman's group, another NMSU geologist who did his MS with Nancy McMillan. Allison is running a Neptune... and maybe a Triton too. No word on Bryce Brown lately. Last I heard, he and Annie own a house near Terre Haute, Indiana, and their girl should be a year old now. Sean Scott (and Veronica) also have a new addition (now 2 girls) in the Tri-cities area of Washington. Please email for if there are updates about the group.

Jennifer Thines

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My second tenure-track year has been busy but exciting! This Spring, Shane Deacon joined the lab as my first graduate student. Shane is working siderite (Fe carbonate)-bearing shales and sandstones of the Cretaceous Crevasse Canyon Formation at the Reynolds Field Station. We made it out there in mid-May and he has since been pouring over many, many thin sections in preparation for microprobe analyses. The lab grew more in the Fall with the addition of Polito Walters. Polito is working on lavas of the Black Mountain-Santo Tomas volcanic chain in the eastern Potrillo Volcanic Field south of Las Cruces. He will be mapping flows and constraining the relationship between the volcanic centers in the chain. His work is supported by undergraduates Alexander O'Connor, Bailey Schaefer, and Melissa Rivero Arias (grad. Spring 2024) who have been diligently working on the petrography and mineral chemistry of samples collected last year.



My love for rhyolites lives with ongoing research into the generation of large-volume silicic magmas. I will soon be submitting a manuscript for peer-review on the thermobarometry of a series of eight large-volume pyroclastic units from the Oligocene Afro-Arabian large igneous province. While I enjoy pouring over huge datasets of mineral chemistry and whole rock analyses, I am also looking forward to integrating more field-based physical volcanology. For next Fall, the hope is to recruit a graduate student to begin work on the tuffs of the Organ and Doña Ana Mountains!

Tiffany Santos and the Zuhl Museum

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The Zuhl Museum is always bustling with activity! If you haven't visited in a while, you're in for a delightful surprise. The museum recently underwent significant renovations and reopened on February 18, 2022, featuring a revamped experience that includes an extensive "History of Life Gallery" and a redesigned "Wow Gallery."

The Zuhl Museum houses 1,800 world-class specimens of petrified wood, fossils, and minerals, making it home to the largest and finest collection of petrified wood on display in the United States. The Zuhl Collection showcases fossils that span time and the globe, from a 3.5-billion-year-old Banded Iron Formation from Australia to a 2.6-million-year-old Giant Ground Sloth from Missouri. Among the rare fossils on display are "Archie," the largest and only skeleton of an *Archeria crassidisca* (a reptile-like amphibian), and "Borealis," a baby woolly mammoth skeleton.

With over 3,500 visitors each year to its 4,000 square feet of exhibit space, the Zuhl Museum has become a must-see destination in Las Cruces and at NMSU. The museum's educational programming is enhanced by outreach events, in-house activities, and an interactive Kids Corner, serving communities across NMSU, Las Cruces, and New Mexico.



Zuhl Museum representatives frequently participate in local gem shows, including the Rolling Stones Gem Show in Silver City, the El Paso Gem Show, the Museum Rocks Gem Show in Las Cruces, the Sierra County Gem Show in Truth or Consequences, and the Rockhounds Roundup in Deming. Community involvement is at the heart of the museum's educational efforts, which include events such as NMSU Night at the Museums, Fossil Day at the Museum of Nature and Science, local elementary school STEAM nights, and LCPS preschool events.

One of the best ways to experience the Zuhl Museum is by taking a tour. We offer free tours to any community group, including schools, conferences, NMSU courses, summer camps, and NMSU departments.

Additionally, internship opportunities and an internship class provide students with real-world experience in the museum field. Our Monthly Second Saturdays feature special weekend hours and unique activities for all ages. Some of our most popular annual events include Creepy Crawlers, A Very Merry Mesozoic, Geode Hunt, and Back to School at the Zuhl.

Looking to be a part of the magic? Join the Friends of the Zuhl Museum and support this crucial work we are doing in the community and NMSU.

<https://zuhlmuseum.nmsu.edu/get-involved/friends-of-the-zuhl-collection.html>



"Archie" *Archeria crassidisca*

Meet Our Graduate Students

New Graduate Students (Spring and Fall 2024)

- **Katie Allbright** (B.S. from New Mexico State University), advisor: Brian Hampton
- **Dave Cheu** (B.S. from University of California, San Diego), advisor: Frank Ramos
- **Shane Deacon** (B.S. from California University of Pennsylvania), advisor: Jennifer Thines
- **Luke Horsu** (B.S. from Kwame Nkrumah University of Science and Technology), advisor: Eric Ferre
- **Polito Walters** (B.S. from California State University, Long Beach), advisor: Jennifer Thines

Leo Kuyl (advisor: Brian Hampton)

I received my bachelors degree in environmental geosciences from Bucknell University in Lewisburg, PA. The topic of my masters degree research is aiming to understand the provenance and depositional history of the Crevasse Canyon Formation, a Late Cretaceous (Coniacian-Santonian) fluvial sequence deposited in the Cordilleran Foreland basin. After the completion of my masters, I will be in Houston after accepting a full-time position from ExxonMobil as a geoscientist in their Upstream business. My favorite moment at NMSU so far has been spending time at the Reynolds Field Station, whether it be with Dr. Hampton's basin analysis class, or for my own research. I'm looking forward to continuing with my research and thankful for the opportunity to spend time in the southwest looking at world class geology!



Camila Mejia (advisor: Frank Ramos)

I completed a B.S. in Geology at Florida State University. I am currently working on constraining crystallization ages of single alkali feldspar crystals in Fogo and Furnas trachytes from the Azores, Portugal. My future career goals are to work at a national lab doing radiochemistry and mass spectrometry. My favorite moment at NMSU so far would be the trashcano experiment for outreach!



Alexis Salmeron (advisor: Jeffrey Amato)

I found my love and passion for geology at my undergrad institution California State University Northridge, where I received my Bachelors of Science degree in Geological Sciences. My current graduate research for my Masters of Science degree involves metamorphic petrology of amphibolites in the Salinas Peak region of the San Andres Mountains. My goals in accomplishing my Masters Degree at New Mexico State University involve establishing myself financially in order to support my family, as I am the oldest of 5 with four younger sisters and a first generation college student. My time at NMSU has been beneficial for me educationally and mentally. I have been presented with many challenges in the classroom and out, so learning to manage each challenge has been beneficial to my growth as a student and a person.



Emma Schantz (advisor: Jeffrey Amato)

I graduated in 2023 with an undergraduate degree in geology from the University of Massachusetts, Amherst. My graduate research focuses on geochronology, specifically on constraining the end of deformation in south-central New Mexico that resulted from the Laramide Orogeny. I am also investigating the ages of specific dinosaur-bearing strata, including the postulated *Tyrannosaurus mcraeensis*. By applying U-Pb dating techniques using Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICPMS), I establish the maximum depositional ages of zircons from various sedimentary rock layers deposited into the Love Ranch basin. This research will be further supported with Ar/Ar dating of detrital sanidine and U/Pb TIMS data.



Reynolds Field Station, NM

Thomas Valenzuela (advisor: Brian Hampton)

I received my undergraduate degree here at NMSU in 2022. As an undergrad, I did research with Dr. Reed Burgette studying fault scarp analysis using ground-based photogrammetry techniques. I am currently working with Dr. Brian Hampton on reinterpreting the sedimentology, stratigraphy, and provenance of Eocene-aged strata in the San Juan Basin. My long-term goals after graduate school are to become a teacher/professor, teaching earth science. However, I am currently looking to gain some experience outside of academia to become a more well-rounded geologist and hopefully at some point a well-rounded advisor. Finally, my favorite moment from my time here at NMSU has got to be the field trip I lead for our Honors Intro class to Lucero Arroyo. I always love teaching my classes, but having the opportunity to teach in the field is my cup of tea.



Doña Ana Mountains, NM



Brian Hampton's GEOL 478/578 field trip to Carlsbad Caverns



"Zoli" *Dimetrodon milleri* (Early Permian), housed at the Zuhl Museum

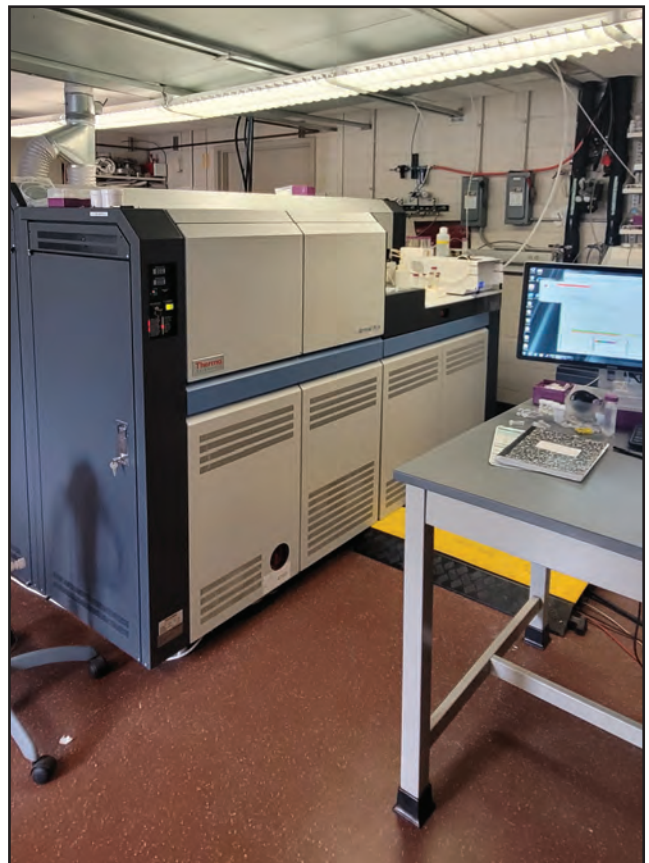
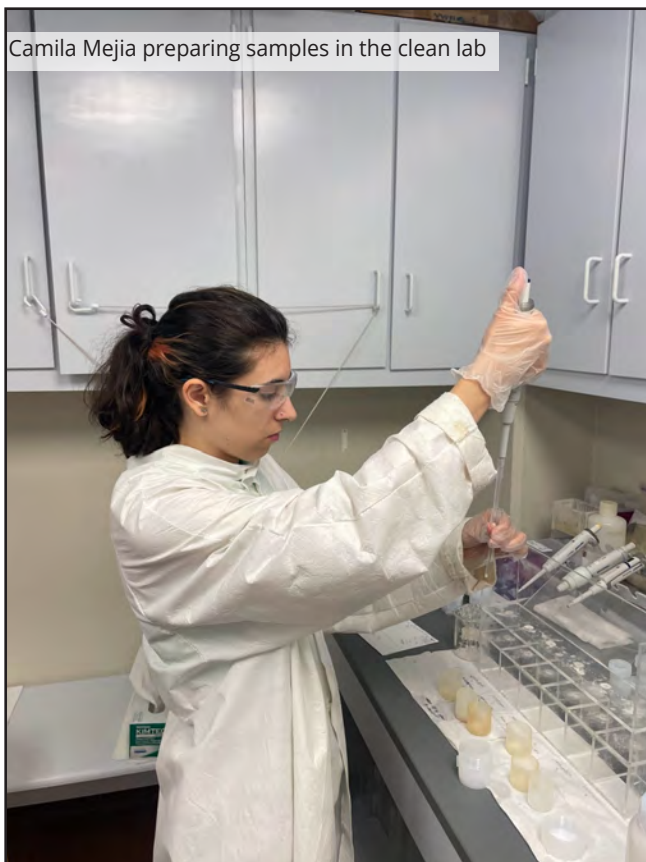
Research Updates

Johnson Mass Spectrometry Laboratory

Great news for the Johnson Lab, we will acquire a new, \$1M ThermoScientific Triton mass spectrometer. As a result of a grant from the Department of Energy (DOE), we will install a new thermal ionization mass spectrometer in spring of 2025. The DOE grant, funded through the NMSU College of Engineering, focuses on training the next generation workforce for national labs across the US.

Specifically, NMSU has teamed up with the Environmental Management division of Savannah River National Lab (SRNL) and the Minority Serving Institution Partnership Program (MSIPP), to implement a program in which NMSU undergraduate and graduate students will take classes targeting nuclear processing and radioactive material usage in preparing them for careers at national labs. These labs are currently seeing very high turnover as a result of retirements associated with an older workforce. Colleagues in the schools of Engineering, Chemistry, Business, and here in the Geological Sciences customized a \$4.8M grant in which to design new courses, revamp the Nuclear Engineering minor, and establish a 10-week summer experience incorporating classwork and hands-on projects for 12 undergraduates recruited from MSI-serving institutions from across the US. Included in the minor are options of Mineralogy, Geochemistry, and Isotope Geochemistry, key classes for our current undergraduate/graduate programs. Summer projects will target young rocks and minerals for U-series dating from Azores and Tenerife volcanoes using the Johnson cleanroom, our current Neptune MC-ICP-MS, and the soon to be installed Triton mass spectrometer.

Learning to operate high-tech equipment has been key to our alumni at Los Alamos (e.g., Steve Levesque, Jacob Buettner, Nick Butterfield, and Allison Mrotek) and Pacific Northwest National Lab (Sean Scott), and will be critical for our future students and students outside geological sciences in building an experience based in which to obtain employment at national labs in the future.



Research Updates

American Geophysical Union (AGU) Fall Meeting, San Francisco, CA, December 11-15, 2023

Ferre, Eric. Faulting processes: recent advances from thermochronology and magnetism. Oral presentation.

Ferre, Eric. Maghemitization of titanomagnetite, submarine alteration and marine magnetic anomalies in the Vøring Basin, North Atlantic. Poster presentation.

Ferre, Eric. Formation depth of earthquake psuedotachylytes. Poster presentation.

Millo, Amit. Mapping steep cliff exposures using Structure-from-Motion to understand the deformation history of the Proterozoic Mazatzal Province in southwestern New Mexico. Poster presentation.

Ramos, Frank. The 2021-22 Hunga Tonga eruption: involvement of three highly depleted magmas in a VEI 6 eruption. Oral Presentation.

New Mexico Geological Society (NMGS) Spring Meeting, Socorro, NM, April 19, 2024

Kuyl, Leo. Stratigraphic history and provenance of the lower part of the Coniacian-Santonian Crevasse Canyon Formation in west-central New Mexico. Poster Presentation.

Salladin, Nicole. New $^{40}\text{Ar}/^{39}\text{Ar}$ detrital sanidine geochronology from the Eocene San Jose Formation, eastern San Juan Basin, northwestern New Mexico. Oral Presentation.

Schantz, Emma. Dating dinosaurs in the Laramide Foreland: U-Pb geochronologic constraints on a stratigraphic section containing *Alamosaurus* and the postulated *Tyrannosaurus mcraeensis* in the Love Ranch Basin, New Mexico, Oral Presentation.

Valenzuela, Thomas. Compositional trends and provenance from Eocene synorogenic strata of the San Jose Formation, east-central San Juan Basin, northwestern New Mexico. Poster presentation.

Geological Society of America (GSA) Connects, Anaheim, CA, September 22-25, 2024

Hughes, Lee. Geochemical evolution and $^{40}\text{Ar}/^{39}\text{Ar}$ geochronology of the Uvas Basaltic Andesite: insights into the early Rio Grande rift. Oral Presentation.

Millo, Amit. Newly discovered stromalolites and bimodal magmatism at ~1.23 Ga in the Burro Mountains of New Mexico: Mesoproterozoic rifting formed from a shallow ocean basin in southwestern Laurentia. Oral presentation.

Salladin, Nicole. New $^{40}\text{Ar}/^{39}\text{Ar}$ detrital sanidine geochronology from the Eocene San Jose Formation, eastern San Juan Basin, northwestern New Mexico. Poster Presentation.

Salmeron, Alexis. Geologic mapping, structural analysis, and microprobe analysis of the Mazatzal Province in the Salinas Peak region, San Andres Mountains. Poster Presentation.

Schantz, Emma. Age constraints on late Cretaceous dinosaurs: geochronologic and stratigraphic analysis of the McRae Formation within the Laramide Love Ranch Basin, New Mexico. Oral Presentation.

ExxonMobil Recruiting Short Course, Tucson, AZ, October 11-13, 2024

Katie Allbright, Luke Horsu, Alexis Salmeron, Emma Schantz, Polito Walters

New Mexico Alliance for Minority Participation (NM AMP) Student Research Conference, Las Cruces, NM, October 4, 2024

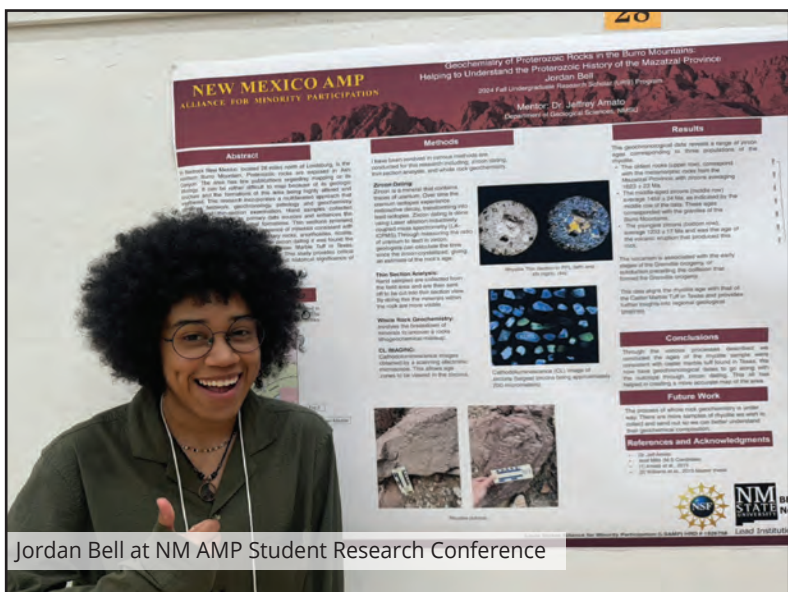
Bell, Jordan. Geochemistry of Proterozoic rocks in the Burro Mountains: helping to understand the Proterozoic history of the Mazatzal Province. Poster presentation.



Thomas Valenzuela (center) presenting at Exxon Mobile in Houston



Emma Schantz at 2024 GSA Connects



Jordan Bell at NM AMP Student Research Conference



Thomas Valenzuela at 2024 GSA Connects



Polito Walters, Luke Horsu, Emma Schantz, Alexis Salmeron, and Katie Allbright (left to right) at ExxonMoobile short course

SPRING 2024 AWARD CEREMONY



Congratulations to undergraduates Jordan Bell, Marisa Dusseau, Jagger Giffing, AJ Guillen, Joanie Keener, Henry Koch, Jenelle McCoy, Alex O'Connor, Chad Pilkington, Bailey Shafer, Alex Shervanick, Xtopher Trujillo and graduates Shane Deacon, Camila Mejia, Emma Schantz, and Leo Kuyl (left to right)



NMGS FALL FIELD CONFERENCE, EASTERN SAN JUAN BASIN

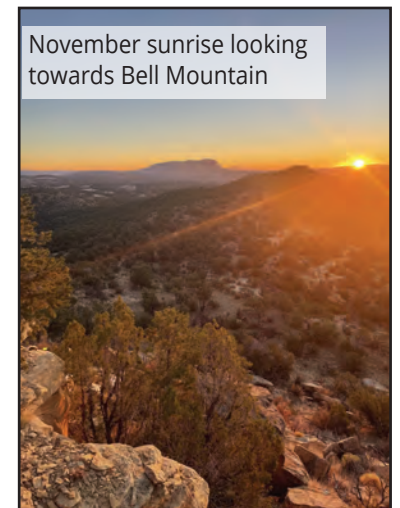


Reynolds Field Station for Education & Science Research



In late March, 2023, Nancy McMillan approached me about a phone call she had with retired geologist/geophysicist, A-Lan Reynolds, and her interest in our field-based approach to undergrad and graduate teaching and research at NMSU. At the time, A-Lan expressed interest in working with NMSU Geological Sciences to develop a new field station on her property located along the southeastern margin of the Colorado Plateau in west-central New Mexico that would operate similar to many of the bygone geology field-camp stations that were common in some geology departments in past decades. Nancy and I had the opportunity to visit A-Lan at the property in May of 2023 and where she shared her not-yet-realized vision of field camp projects and facilities (e.g., bunkhouses, kitchen, bathrooms, etc.) and what she envisioned for the property. Both A-Lan and her late husband John spend part of their careers as geologists/geophysicists in industry and shared a distinct passion for promoting curiosity and discovery for anyone interested in participating. To that end, their vision for the newly recognized Reynolds Field Station (RFS) is that it serves as a unique landscape where researchers and educators at any level (K-12, university, retirees, etc.) can study a range of different foci (geology for sure but also biology, anthropology/archeology, and astronomy to name a few).

As I reflect on the nearly 19 months since A-Lan initially reached out to NMSU Geological Sciences, to say that A-Lan and John's initial vision is becoming realized is an understatement! The field station is now complete with 2 bunkhouses, bathroom, kitchen/research hall/library, and enormous deck that bridges between all buildings. Last fall, we ran 1 graduate field trip through the field station and started up with 2 graduate students (Leo Kuyl and Shane Deacon) conducting graduate research on the property. In addition, we've had joint field time where NMSU faculty and students have met with researchers and educators from Indiana University, the Perot Field Museum of Nature & Science, and the NM Bureau of Geology & Mineral Resources. This past September, A-Lan launched the new website for the RFS which corresponded with an NMSU press release. A-Lan and NMSU hosted a booth for the RFS at the 2024 GSA Annual Meeting and some of the first new data collected from the RFS was presented at the GSA meeting. This past summer, graduate student, Thomas Valenzuela and I developed a new field camp curriculum that will be used for the first time at the 2025 NMSU Summer Field Camp. Finally, and perhaps of most interest to the growth of our department is that A-Lan also graciously helped us with funding a new tenure-track faculty line (Dr. Andrew Flynn) that will start in our department in January, 2025!



November sunrise looking towards Bell Mountain

To say that there is a groundswell of interest and excitement for the RFS at NMSU and beyond would be an understatement! If you have a chance, please try to visit the RFS website to get more context on the mission and goals of the field station. And, if you have any interest in visiting the RFS and/or receiving more information on supporting the field station, please don't hesitate to reach out!

- Dr. Brian Hampton (NMSU Field Camp Director)

Recent Press Release: <https://newsroom.nmsu.edu/news/nmsu-geology-partnership-gives-students-access-to-reynolds-field-station/s/af67930c-71f9-45df-bbf5-7de3e7ca3016>

To learn more about the Reynolds Field Station for Education & Research, visit
<https://www.reynoldsfieldstation.org/>



Long exposure image (photo credit: Leo Kuyl).

NMSU Geology Alumni Milestones

Undergraduate Program

40 years for the Class of 1984:

Paula Barreras, Lynn Berkery, Bruce Black, Mark Brown, Elaine Daymon, Jerry Dutchover, Clark Emrich, Frederick Flint, Kenneth Fresquez, Wallace Gilmore, Frederick Huff, Catherine Humphrey, Caiti Keegan, Timothy Cramer, Luis Morales, Chris Percy, Delbert Utz, Donald Whitley, Marc Zocher



30 years for the Class of 1994:

Gregory Aller, Chris Amador, Matt Brewer, Michael Broadwell, Curtis Carter, Gregory Clark, Alicia O'Brien, Christian Paul, Daniel Young

20 years for the Class of 2004:

Derek Adams, David Febre, Joseph Hennessey, Melissa Ille

10 years for the Class of 2014:

Jaime Campo, Angelica Campos, Michael Ferguson, Kyle Ivey, Tara Jernigan, Kristen Marris, Lucas Middleton, Shannon Rees



Graduate Program

40 years for MS Degrees from 1984:

Jeffry Grisby, Tinka Hyde, Stephen Lopez, Earl Morse, Robert Newcomer

30 years for MS Degrees from 1994:

Scott Anderson, Marc Haga, John Kieling

20 years for MS Degrees from 2004:

Michael Cleary, Leyla Kirkpatrick, Kyle Shipley, Brent Waidmann

10 years for MS Degrees from 2014:

Meredith Curr, Kraig Koroleski, Carlos Montoya



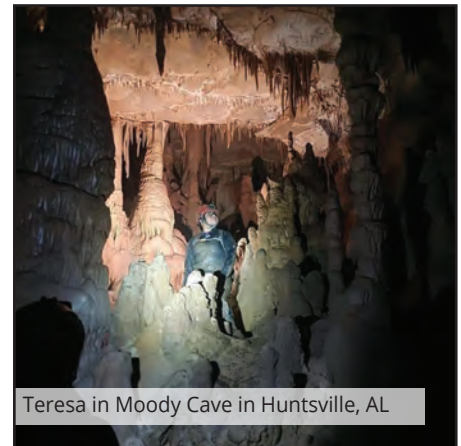
ALUMNI UPDATES



Photo credit: Frank Ramos

William Seagar, Emeritus Professor, was awarded the 2024 Earth Science Achievement Award for research and education this past April. This lifetime achievement award was presented by the New Mexico Bureau of Geology of Mineral Resources for Bill's significant contributions to our understanding of the lower Rio Grande corridor.

Teresa Dominguez, B.S. 2023, is in the second year of her Master's at the University of Alabama with Dr. Fred Andrus. Her project titled "Stable Isotope Sclerochronology of *Ostrea edulis* Shells from the Adriatic Sea" focuses on the growth patterns *Ostrea edulis* (European flat oyster) shells and isotopic variations of shells and their applicability as a climate proxy. She plans to graduate in Spring 2025 and is currently in the process of applying to PhD programs.



Teresa in Moody Cave in Huntsville, AL

Kristin Marris, B.S. '14. I have been living in Australia for about nine years now and received my Australian citizenship two years ago.

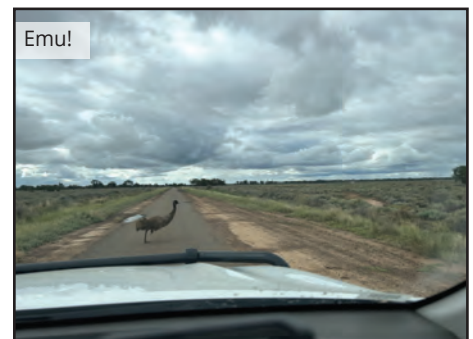
The pandemic jumpstarted my career in geology as the world stopped, but the mining industry continued on. I moved to the outback town of Kalgoorlie, Western Australia where I worked several roles for Northern Star at the Superpit and Mt. Charlotte. This included in pit grade control, underground production, and finally resource definition. After a few years out west, I moved back to the east coast where I now work for Inflection Resources as a project exploration geologist. We are testing the northern extension of the Macquarie arc (host to Cadia, Northparkes) under significant cover depths. I absolutely love this role, and my passion is to be part of the next big discovery.

These roles have taken me to very remote parts of Australia and I am now (almost) skilled in dodging kangaroos, emus, livestock and feral pigs on outback roads.

Hope to make it back for one of these field trips, I loved my time in New Mexico and at NMSU!



Kristen (right) for Northern Star during an underground BG4 training scenario



Emu!

Have any news to share? Please email any alumni updates to jthines@nmsu.edu

Department of Geological Sciences



Please join us to honor our two new members of the
NMSU Geology Hall of Fame:

Dr. Jennifer Garrison, MS '98
and
Dr. Brenda Buck, MS '92

- **Friday, November 8:** Hall of Fame Luncheon, Open House, and Alumni/Faculty Dinner
 - Luncheon starts at 12 pm at the Farm & Ranch Heritage Museum, 4100 Dripping Springs Rd
 - Open House from 1:45 - 4 pm with undergraduate and graduate research presentations at Gardiner Hall
 - Alumni/Faculty Dinner at 6 pm at Chilitos, 3850 Foothills Rd #10
- **Saturday, November 9:** Geology Alumni Field Trip to Aden Crater (students and families welcome!)
 - Departs from Gardiner Hall at 8:00 am
 - Light breakfast served in the lobby

RSVP at geology@nmsu.edu by 8 am MST on
Tuesday, November 5

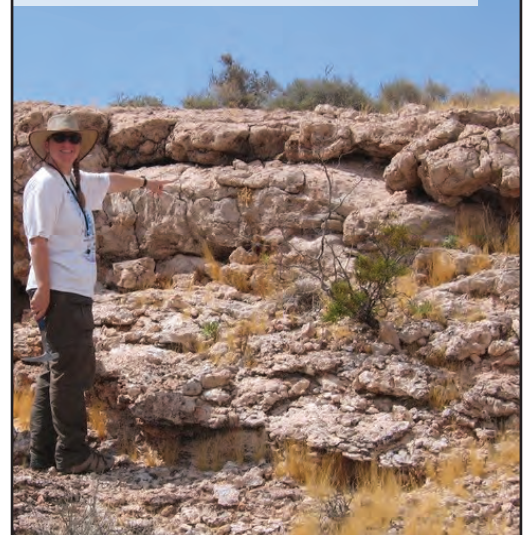
Dr. Brenda Buck, MS '92, PhD Agronomy/Soil Science '96

After graduating with my M.S. in Geology, I went on to complete a Ph.D. in Agronomy/Soil Science at NMSU. I have spent the last 27 yrs as a Geoscience Professor at UNLV. I've had successful grant funding, just under \$19 million so far, and I built a fantastic laboratory that did all kinds of analyses on dust, soil, rock, water, plant, and even human tissues. I've been honored to be elected into both the Fellowship of the Geological Society of America and the Soil Science Society of America. I have had the pleasure of working in 18 countries on 6 continents, teaching or doing field research in some of the most remote places on Earth. I've had the joy of working with fantastic students and colleagues on research spanning a great many subjects including: soil pedology, soil- geomorphology, salt mineral formation and processes, desert paleosols and paleoclimate (including Quaternary, Tertiary, and Mesozoic), salt tectonics/petroleum exploration, mineral dusts, biological soil crusts, and environmental contamination.

In my mid-career I shifted my research focus to Medical Geology to better understand how earth materials affect human health.

My research team found naturally-occurring asbestos near Las Vegas NV. A controversy ensued when the Nevada State Health Department issued us a cease and desist order, preventing us from publishing our data on occurrence of mesothelioma in southern Nevada. Our work also temporarily stopped the building of a multi-million dollar highway in order for protective measures to be implemented to protect the workers from asbestos exposure during construction. Our work was highlighted in the New York Times, Earth Magazine, PBS NewsHour and many other media outlets. I love New Mexico, and my favorite times were NMSU fieldtrips! My advice to current students is to take advantage of all the opportunities available to you, especially the fantastic field geology.

Brenda in Nevada next to a petrocalcic horizon



Dr. Jennifer Garrison, MS '98

Jennifer received her BS in Environmental Geology from Colorado State University in 1995. In the fall of that same year she arrived at NMSU to begin her MS in geology with Nancy McMillan. Their research focus was on metabasaltic blocks contained within the El Papalote salt diapir in northern Mexico. After completing her degree in 1997, she attended UCLA under the mentorship of the late Jon Davidson to study volcanism in the Northern Volcanic Zone of the Andes. Her research on Cotopaxi Volcano resulted in establishing a strong and career-long collaboration with colleagues in Ecuador. She completed a post-doctoral scholarship at the University of Iowa in 2006, applying uranium-series isotopes and zircon chronology to the Ilopango caldera system in El Salvador. In 2007 she was hired at California State University, Los Angeles, where she continues to teach and conduct research. In 2010 she received an NSF grant to study rear-arc magmatism in Ecuador, and she continues to use isotope geochemistry and zircon geochronology to establish eruption timescales and identify petrogenetic process in Ecuador volcanoes, in particular El Reventador and most recently Volcan Sumaco. In addition to her focus on arc magmatism, she also studies explosive rhyolite volcanism in the Mojave Desert, as recorded in volcaniclastic sediments of the Miocene Pickhandle Formation. In Spring of 2024, her research and collaboration was the focus of a Fulbright Ecuador Award, and she spent spring semester living in Ecuador and pushing forward her research on the Ecuador Alkaline Province, as well as working toward establishing an International Visiting research Program that will facilitate travel, cultural ties, collaborative research and opportunities for students in Ecuador and the US.



Thanks to the generous donations of our alumni, undergraduate and graduate geology students have been awarded scholarships for research, books, and conference travel every Spring.

Telethon 2024
Tuesday, Dec 3
8:30 - 4:30 MST

On Tuesday, December 3, two of our graduate students will be hosting a telethon fundraising event from 8:30 - 4:30 MST.

Our goal is to raise the funds so that the *William R. Seagar Undergraduate Scholarship* and *Nancy J. McMillan Undergraduate Geology Scholarship* attain vested status, allowing for awards to be made to students.

**William R. Seagar
Undergraduate Scholarship**



[https://nmsufoundation.org/givenow/
William_R_-
Seagar_Undergraduate_Scholarship.html](https://nmsufoundation.org/givenow/William_R_Seagar_Undergraduate_Scholarship.html)

**Nancy J. McMillan Undergraduate
Geology Scholarship**



[https://host.nxt.blackbaud.com/donor-form/?
svcid=tcs&formId=60599853-78f8-4328-
ad3f-694f0ffe6707&envid=p-E-OMB_qy3USeTydKW5FI7g&zone=usa](https://host.nxt.blackbaud.com/donor-form/?svcid=tcs&formId=60599853-78f8-4328-ad3f-694f0ffe6707&envid=p-E-OMB_qy3USeTydKW5FI7g&zone=usa)

Every donation, no matter how big or small, makes a difference in our students' lives and helps them build a successful future.

Please consider donating to the scholarship funds above and **thank you** for your support of our department!



Thomas Valenzuela preparing material for Field Camp 2025



Katie Allbright during volcano demonstration at T or C Middle School outreach event in September 2024



Jennifer Thines' HNRS 2116G field trip to White Sands National Park



Alexis Salmeron (left) and Amit Millo (right) at Black Canyon of the Gunnison National Park



Trashcano demonstration at the Trio/Upward Bound Geology Camp at NMSU in June 2024



Undergraduate Jagger Giffing at the RFS



Polito Walters, Ana Peinado, Noah Clausen, and Shane Deacon conducting field work at Santo Tomas, Potrillo Volcanic Field, NM



Left to right: Jennifer, Pam (Perot), Dori (Perot), Shane, Brian, and Tabatha (Perot)



Graduate students Leo Kuyil and Nicole Salladin during field work last November at the RFS



Leo Kuyil mixing ingredients for the Sierra Middle School Science Magnet Field Trip at NMSU in September 2024



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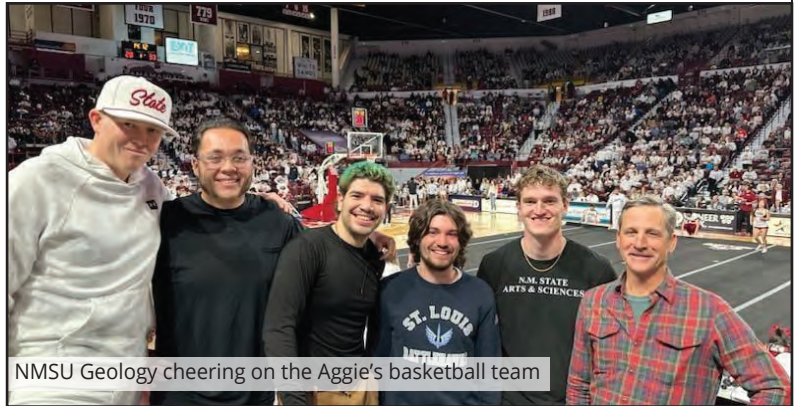
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BBQ after a field trip in the Sacramento Mountains



NMSU Geology cheering on the Aggie's basketball team



Shane conducting field work at the field station

Anything you would like to see in the newsletter? Please send an email with any suggestions or requests to Jennifer Thines, jthines@nmsu.edu

