



UNIVERSITY OF OKLAHOMA SCHOOL OF GEOSCIENCES

# EARTH SCIENTIST

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# ABOUT THIS ISSUE

**Editor:** Ashley Tullius and Matthew Pranter, Ph.D.

**Layout and design:** Ashley Tullius

**Contributors:** Geosciences Faculty, Students and Alumni

**Cover Photo Credit:** Sarah George, Ph.D.

## CONTACT US:

School of Geosciences  
100 E. Boyd St., Room 710  
Norman, OK 73019-1007

**PHONE:** (405) 325-3253

**EMAIL:** [geology@ou.edu](mailto:geology@ou.edu)

**Did You Know:** The *Earth Scientist* has showcased departmental news since 1982. Its earlier incarnation was known as the Sooner Geologist, which debuted in 1967. Thus, accounting for the rare exceptions of years unpublished, we are now on volume 47 of the alumni magazine. And, prior to that, we have records of our alumni newsletters dating to 1959.

The *Earth Scientist* welcomes short letters from readers, and will print them as space allows. Letters should address some item from a previous issue. Please include your name, city and state, as well as an email address, for purposes of correspondence. We may edit your letter for space, style and civility, without distorting the substance or spirit of your piece. We reserve the right to decide whether a letter is acceptable for publication.

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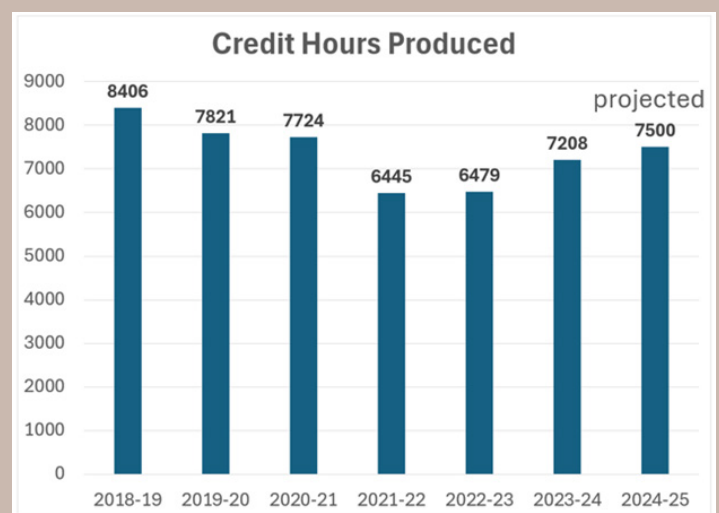
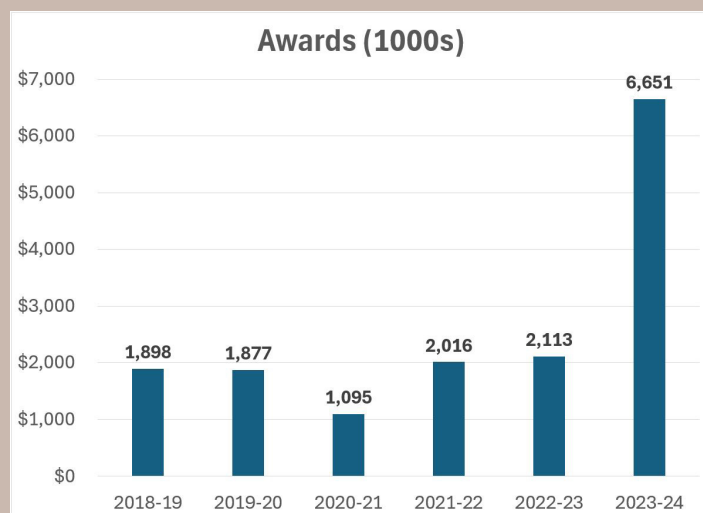
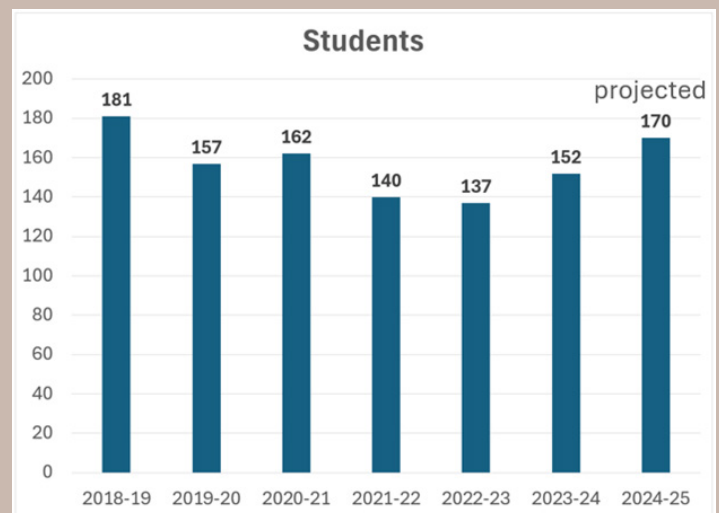
MEMORIALS  
CONNECT

# DIRECTOR'S LETTER

**Matthew J. Pranter, Ph.D.**



The faculty, staff and students in the School of Geosciences had another very successful year! Of significance, the school had a record year in terms of research, with \$6,651,177 in research awards, a significant increase over previous years (see graph). We saw an increase in our graduate applications, and both graduate and undergraduate enrollments are increasing. With 20 new graduate students starting this fall 2024 (15 M.S. and 5 Ph.D.), the number of graduate students rose from 56 in spring 2024 to approximately 66. Our undergraduate enrollment increased from 89 in spring 2024 to approximately 98 majors with a projected total enrollment of geosciences students for fall 2024 approaching 170. Last year, our faculty taught >500 credit hours/FTE (for teaching-eligible faculty) and >7,200 credit hours in total. Of these credit hours, we generated >4,273 credit hours in general education geosciences courses for 1,227 students.



The 2023–2024 academic year held several changes for the Mewbourne College of Earth and Energy and the School of Geosciences. Our interim dean, Dr. John Antonio, officially became our permanent dean effective July 1, 2024. We are excited that Dr. Heather Bedle earned tenure and promotion to associate professor. Dr. Héctor Lamadrid joined the faculty as an assistant professor in fall 2023 and focuses on igneous and metamorphic processes and critical minerals. Dr. Lamadrid was previously an assistant professor at the University of Missouri. We are also excited that Dr. Hao Hu joined the faculty in August 2024 as a new assistant professor in energy geophysics. Dr. Hu brings much-needed expertise in the areas of seismic imaging and seismic processing, and he comes to OU with experience in the energy industry with TGS and as a researcher at the University of Houston. We congratulate Dr. Younane Abousleiman, who retired in May 2024 and is now emeritus professor, and we wish him well. Finally, Dr. Kato Dee resigned last summer to start a position as a hydrogeologist with Tetra Tech and Dr. Sina Saneiyani recently resigned to begin a new adventure as an assistant professor at Binghamton University. We wish Kato and Sina and their families all the best. We recently received approval to begin a new search for an assistant professor in hydrogeosciences.

The School of Geosciences continues to benefit greatly from our alumni in terms of substantial financial support and their time. Through the generosity of our alumni, friends and industry donors, we have funds to support our faculty, staff and students as well as many of our academic programs, including field camp. We offer numerous scholarships each year and approximately 75% of our undergraduate majors and 100% of our graduate students receive scholarships. Two key programs for which we continue to seek funding include our newly created **Geosciences Field Trip Endowment Fund** (OU Foundation Fund #43418) that supports course-related field trips and

the **John D. Pigott Memorial Fund** (OU Foundation Fund #43459) that supports guest speaker expenses for the weekly John D. Pigott Memorial Colloquium Series. We welcome and greatly appreciate gifts of any amount to help support these two programs!

#### Other notable events:

- Dr. Heather Bedle was awarded the Edith Kinney Gaylord Presidential Professorship.
- Dr. Caitlin Hodges and team received a \$879,831 grant from the U.S. Department of Agriculture, National Institute of Food and Agriculture “Partnership: Soil Carbon Pools and Fluxes in Grasslands: Responses to and Recovery from Drought and Land Management Intensification.”
- Dr. Andrew Madden and team received a \$2,573,750 grant from the National Science Foundation, “Equipment: MRI: Track 2 Acquisition of an analytical aberration corrected transmission electron microscope for research and education.”
- Dr. Lynn Soreghan and team received a \$2,306,793 grant from the National Science Foundation, “Collaborative Research: EAR Climate: Earth-System Responses to the Penultimate Icehouse-Greenhouse Transition.”
- AAPG Foundation supported the Spring Student Expo with a \$10,000 award.
- Alex Cordero and Milly Hency won first place in the Gulf Coast Regional Challenge Bowl hosted at the GSH Spring Symposium and will compete in the International Finals during IMAGE this fall.
- April Moreno-Ward placed first in the graduate student division at the OSU TechFest.
- We will roll out a new updated School of Geosciences website soon!

I hope you enjoy this issue of the *Earth Scientist*!

–**Matthew J. Pranter**

Director and Eberly Family Chair

# DEAN'S LETTER

**John Antonio, Ph.D.**



As dean of the Mewbourne College of Earth and Energy, I am excited for you to read this edition of *Earth Scientist*! Like me, I know you are constantly amazed and proud of how the School of Geosciences continues to reach new heights of excellence. As mentioned in Matt's welcome letter, key metrics for the school such as student enrollment and extramural research awards have been increasing at impressive rates over the past several years. In fact, receiving research awards totaling more than \$6.6 million in fiscal year 2024 is unprecedented for OU's School of Geosciences. This achievement catapults OU Geosciences to a level of research excellence that ranks among the very top Geoscience programs in the nation.

Excellence in competitive research funding is aligned with, and directly supports, OU's strategic goal of meeting the Association of American Universities-quality benchmarks, which will position OU among the top universities in the U.S. By striving for and achieving this level of excellence, the School of Geosciences, in turn, can attract and retain outstanding faculty, students and staff – a cycle of growth and achievement that feeds on itself. I am so proud of how the faculty and staff have seized on this opportunity in amazing fashion by recruiting outstanding students to our Geosciences programs. As a result, Geosciences is on track for significant year-over-year increases in student enrollment for a second consecutive year.

Although quantitative measures of growth for Geoscience research and academic programs are extremely impressive, I am even more excited about key underlying catalysts that are driving this growth – the diversification of research topics being pursued, and new academic programs being developed. For example, in just a few short years, the paleontology option for the undergraduate degree program has gone from a concept to now accounting for nearly 40% of the incoming freshman class. As a result, the School

of Geosciences is establishing itself as one of the premier programs of this type in the region. Our strong partnership and collaboration with OU's Sam Noble Oklahoma Museum of Natural History is an important aspect of this success. I firmly believe that expansion of Geoscience research and academic programming creates a vibrant and exciting environment for all students.

Geosciences of course also continues to expand and build upon our strong legacy of excellence in energy-related topics. Our geosciences students are among the most sought after by the energy sector – our reputation, dedication and leadership tied to this critical industry is second to none.

Speaking of new academic programs, over the past year it has been my honor to chair a university-wide task force charged with developing a new sustainable energy systems (SES) certificate program. The task force consists of more than 30 faculty from 10 colleges across the OU Norman campus. The SES undergraduate certificate was approved by the OU Board of Regents in March 2024 with students enrolling in fall 2024. About six students from Mewbourne College (including geoscience students) are part of the first cohort of about 22 students representing five different colleges across campus that will begin the SES certificate program in fall 2024.

In summary, OU's School of Geosciences continues to excel in many dimensions. I couldn't be prouder of the accomplishments that Matt and his team have achieved during the past year. And I can't wait to see what is in store for the future!

**–John Antonio**

Dean and Lester A. Day Family Chair

# AAC CHAIR'S LETTER

**Tiffany Stephens**



Dear Alumni, Students and Faculty,

It's been a good semester for the AAC and student engagement. Student events are finally starting to get back up to pre-COVID participation. The students led a TopGolf event, partially sponsored by the AAC, at the end of March. It had the highest student turnout since 2020, when COVID halted everything. The AAPG Student Expo was held March 15 and had 27 posters. After several years, the AAPG Foundation returned as the head sponsor for this event. Several oil and gas companies came and interviewed students. The research symposium was held April 5 and hosted over 40 posters. It was held the same day as our AAC spring meeting and we sponsored the bar at the awards reception. Both were very successful, and we are already preparing for the Fall AAC meeting, where we will have a guest speaker and student-alumni lunch. We are also planning an alumni-led colloquium, where we will have discussions with the students about the university and the geosciences program. We want to know their ideas of how we can help them and improve the school.

We have many AAC members from the energy industry who help support the university and many students who graduate from the School of Geosciences get their start in the industry. These jobs remain somewhat steady, though gas prices have fallen to an inflation-adjusted 50-year low (hovering below \$2). These gas prices make it difficult for some operators to continue drilling, but it also means that natural gas will remain a low-cost, clean energy source for a long time to come. While there is still a lot of misinformation and ill feelings towards the oil and gas industry in the U.S., it is still very essential for our lives. With the rising demand for energy (to keep up with the population and with modern technologies, like AI), we will need all forms of energy. Accordingly, the Dean's office has successfully established a new certificate that aims at educating the typical student on the different forms of energy and how they affect and interact with the environment. It is called the Sustainable Energy Systems (SES) Certificate and it is available to all majors. Faculty and staff from 10 different colleges across campus are working together to create a unique curriculum. It requires two core classes and a number of electives that will strive to educate and elevate. It is a great way to approach energy in a diplomatic and scientific way. Our students and our university will be leaders in this area of Earth and Energy. I encourage everyone to learn more about this certificate and spread the word. Also, please keep informed, stay involved, and vote!

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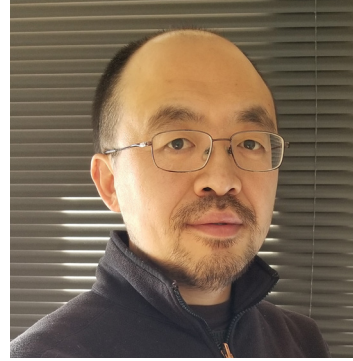


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COORDINATOR



# MEET THE NEW FACULTY



## HAO HU

**ASSISTANT PROFESSOR**

The energy transition plays an increasingly vital role in balancing climate change and energy consumption. It raises growing attention from society, industry and academia, and requires multidisciplinary efforts to create a sustainable and equitable energy future. Seismic exploration is pivotal in tackling challenges in energy transition by providing indispensable subsurface information.

Hao Hu is a geophysicist using seismic signals and methods to address how to balance climate change and energy consumption via the exploration of geothermal/fossil resources and CO<sub>2</sub> geological storage; how to solve cutting-edge scientific and technical problems in understanding the subsurface geological structures, from shallow to deep; how to conduct fundamental studies of seismic theory and algorithm, especially in seismic wave propagation, imaging and inversion; and how to develop industrial solutions that can perform efficiently, accurately and stably.

Hao's research broadly covers the frontiers of seismic, including the exploration of energy resources (geothermal and fossil fuels), CO<sub>2</sub> geological storage

and understanding of the Earth's structures from shallow to deep using seismic data, using high-performance computers. He also studies fundamental theories of seismic wave propagation, imaging and inversion. Many interesting research examples and annotations can be found on his research website: <https://sites.google.com/view/hao-hu>

Before he joined the OU, he was a postdoctoral researcher and research assistant professor in seismic imaging at the University of Houston since he got his doctoral degree from the Chinese Academy of Science. Later he worked as a senior research geophysicist at TGS, a leading seismic data and service company in the oil and gas industry. Hao is very collaborative and inclusive both in work and life. He believes honoring a culture of inclusivity, diversity and equality will bring more productivity, creativity and pleasure. Besides the research and teaching, he enjoys spending time with family, cooking and working on cars.

# SOIL AND WATER CONVERSATION SOCIETY



## JACOB CLEMENTS, PRESIDENT

***"Anything can grow if you have the drive to make it so."*** This quote perfectly captures the spirit of the University of Oklahoma and the Soil and Water Conservation Society OU Chapter.

In my last update, I wrote, "Earth is at a crossroads. Anthropogenic climate change continues to worsen. This is not a problem that exclusively affects developing nations, or anywhere outside of North America, but is one of the truly global problems we face." In that spirit, the Soil and Water Conservation Society-OU Chapter, together with each and every one of you, has spent the past year highlighting how the global problem of anthropogenic climate change affects our communities in Oklahoma.

First, we organized a stream cleanup in the Lake Thunderbird watershed. This stream was impacted by decades of anthropogenic waste and has been a cleanup priority for the City of Norman. We proudly announce that our SWCS group collected over 300 pounds of trash during our spring cleanup day. Our actions made a direct difference in the city's water quality and furthered Norman's progress in securing EPA funding for future site cleanup.

Second, we were proud to give to the OU Food Pantry twice throughout the year. We contributed canned goods to the Fall Food Drive, helping reduce food waste in our community. Additionally, we donated household items to the OU Food Pantry during Ethan Downs' Second Annual G.I.V.E. Mission. Ethan's G.I.V.E Mission has received national recognition from Allstate Insurance, and we are proud to have

contributed to keeping items out of landfills and helping fellow students.

Finally, SWCS partnered with Geologize, an internationally recognized geocommunication firm, to train all OU Geosciences students and alums to improve science communication. We believe that as scientists, we need to become better communicators of our research in this modern media age, and this training provides a critical step toward that goal. By covering how to discuss geoscience topics on social media, this training helps geoscientists share essential earth science problems to meet the needs of modern-day society. We are proud to say that OU is now the first university in the state to have this training available, and we hope future generations of OU Geosciences students and alums benefit from it as well.

As my tenure as president comes to an end and I move on to another institution to pursue my Ph.D., I cannot help but be proud of the Soil and Water Conservation Society-OU Chapter's progress. I also firmly believe that under the next administration of President Mackenzie Flynn, Vice-President Ben Matsumura, Treasurer Parker Lynn, Social Media Coordinator Brittany Moehnke, and Secretary Faith Hylton, the Soil and Water Conservation Society OU Chapter will continue to grow and make a difference in the Norman community. I hope you cheer them on from wherever you may be and that you feel inspired to address the effects of anthropogenic climate change in your community.

# AAPG STUDENT CHAPTER

**DECLAN MARTIN,  
PRESIDENT**

When looking back on the 2023–2024 academic year, it's hard for only one thing to come to mind. With events ranging from August to May, AAPG went start to finish, in a time which included conferences, tech talks, an energy week and so much more.

This past year AAPG brought in an almost entirely new officer core, with a mix of undergraduate and graduate students. The club hit the ground running in August before school even started, unveiling a brand new arsenal of merchandise. Immediately after school began AAPG participated in one of its biggest events of the year, the annual IMAGE Conference in Houston. It would not be the only conference AAPG would attend that year, as the club was also present at the AAPG MIDCON

Conference in Oklahoma City in October. At these conferences AAPG represented OU while networking with industry leaders and alumni.

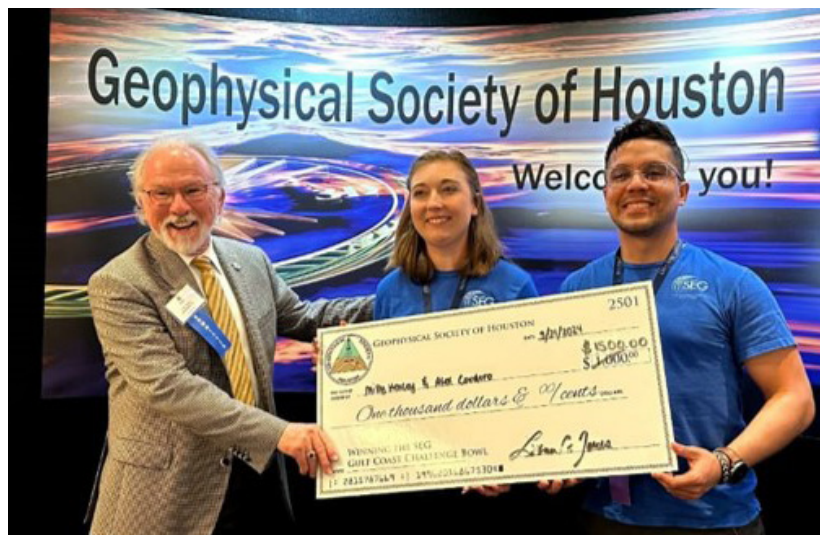
The fall was also a mixed bag of other events. With the goal of diversifying the club's events, AAPG held tech talks, and a tailgate, and hosted a blood drive. The club was also present at the annual Oklahoma Trailblazer award in Oklahoma City, where industry leader and founder of Devon Energy Larry Nichols was honored. This was yet another opportunity for the club to represent the School of Geosciences and the University of Oklahoma at one of the state's most distinguished events.



Turning the page to the spring, second semester was marked by one of the club's largest and most highly anticipated events of the year, the annual AAPG Energy Week. Held in March, Energy Week encompassed a different event every day. Throughout the week, AAPG hosted two tech talks, a happy hour, gave away donuts and coffee, and also provided special new shirts and stickers dedicated to the week. Energy Week was capped off with the AAPG TopGolf Event that made its return for the first time since 2019. The week was successful in terms of how many students of different disciplines participated in the events. The club's goal of encompassing more of the school in its events was undoubtedly achieved.

The remainder of second semester involved an array of different events similar to the fall, including hosting another blood drive, an additional tech talk and doing outreach at a local elementary school. Overall, AAPG had a very diverse year in terms of the events AAPG hosted on campus as well as the events the club attended on the state and national level. With goals of a more diverse calendar of events and encompassing more students of different disciplines, AAPG reached its goals while strengthening the core values of the club. This is something the club is proud of and will look to build on in the coming year. We thank everyone who participated in our events and supported us this year and look forward to seeing you all again in the fall.





# SEG STUDENT CHAPTER

## ALEXANDER CORDERO, PRESIDENT

The University of Oklahoma's SEG Student Chapter (OU SEG) is proud to celebrate a remarkable year, achieving Ridge-level status and solidifying our position as a leading force within the geosciences community. Thanks to the generous support of Chevron, ConocoPhillips and Mewbourne College of Earth and Energy, we embarked on a journey of learning, collaboration and outreach. Our year was packed with exciting events, including attending two conferences, visiting the Devon Energy Subsurface Center and hosting workshops, technical talks and social gatherings. These activities provided valuable opportunities for our members to connect with industry professionals, network with peers and gain practical insights into the world of geophysics.

We are delighted to highlight an extraordinary milestone for one of our most esteemed professors and mentors at OU. Kurt Marfurt, Ph.D., was honored during the 2023 IMAGE conference with the SEG Maurice Ewing Medal for his trajectory and contributions to geophysics. CONGRATULATIONS! We shared this incredible moment with current students, faculty and alumni.

Another highlight of the year was sending two teams to the Gulf Coast Regional SEG Challenge Bowl Qualifiers, where our president, Alexander Cordero, and our upcoming vice president Milly Hencey, emerged victorious against seven other universities! This is the first time in our student chapter, Boomer Sooner! They'll now compete at the global SEG Challenge Bowl in August 2024, showcasing the exceptional talent within our chapter.



Beyond competition, we prioritized fostering a vibrant learning environment. Technical talks explored diverse topics, from "Injection-induced Seismicity" with Katie Smye, Ph.D., to plate-tectonic with Joann Stock, Ph.D., from Cal Tech. We also embraced the future of energy by delving into geothermal resources with Pierre Karam, Ph.D., and discussing "Subsurface Risk Considerations in Petroleum Geoscience" with Kurt Rudolph.

Collaboration was a cornerstone of our year. We partnered with fellow OU student chapters and universities, including AAPG and SPE, as well as international chapters in Venezuela and Argentina. This synergy allowed us to expand our reach and share knowledge across borders. As we reflect on our achievements, we set our sights even higher. We envision becoming the premier SEG chapter globally, inspiring and empowering the next generation of geoscientists. With dedication, collaboration and a commitment to continuous learning, we are confident in shaping a bright future for our chapter and the broader geosciences community.

We extend our heartfelt gratitude to our student members, faculty and staff for their unwavering support for every event, and we wish the incoming committee all the best for their future endeavors.



## **BRAEDEN MORELAND, VICE PRESIDENT**

Coming out of the gates, the 2023–2024 academic year was of high hopes for the Pick and Hammer Club. Just two years after the pandemic had shut down all of our outreach opportunities, the club is back to reaching thousands of students across Oklahoma and Kansas through our outreach endeavors, thanks to our past two officer groups. With the work of President Xander Margheim, Vice President Braeden Moreland, Secretary Aelin Johns, Lead Outreach Coordinator Stacey Love, Assistant Outreach Coordinator Parker Lynn, and Archivist Addie Barnes, the club was excited to continue and further expand upon the fantastic work of the past groups during the 2023–2024 academic year, looking to fully bring ourselves back and even surpass our historic outreach efforts that the club is renowned for.

Pick and Hammer prides itself on delivering geoscience-based outreach and learning opportunities to students, adults and numerous organizations across the state of Oklahoma in order to spread the word about the amazing field of geoscience and hopefully inspire the next generation of geoscientists. With the connections and relationships established during the past several years with numerous schools and organizations, we were able to, once again, participate in countless fantastic outreach events that gave us the opportunity to teach thousands of students and adults about geology, and we were even able to expand the magnitude of our role within several of these events that enabled the club to have an even greater impact. Among these events that we were

able to expand our role in was the Oklahoma Science Olympiad, which graciously invited us back for another year to create and proctor tests to help foster learning of the geosciences among middle and high school student participants. In the past, the club has been asked to develop tests in two categories for these events, but this year, we were able to write and monitor tests in three different categories – Fossils, Dynamic Earth, and Geologic Mapping – across every Science Olympiad event held in Oklahoma this year!

Additionally, the club and our officers were once again quite busy this year with numerous other outreach visits and tabling events that allowed us to teach geology to people of all ages. Among these events were Camp Crimson, Fall Shell Fest, the Mewbourne College Welcome Back, OERB STEM nights, the Oklahoma City Geological Society's Gem and Mineral Show, the Norman Earth Day Festival, Space Day at Science Museum Oklahoma, and the Plaza District's annual Plaza Fest, to name a few. The club was even able to establish new connections for geology learning nights with Norman Public Libraries due to fantastic planning from our Lead Outreach Coordinator, Stacey Love, as well as maintain our school visits out of the state in Kansas, thanks to president Xander Margheim's connections in his home state. These events have provided Pick and Hammer with the opportunity to visit with and teach thousands to tens of thousands of people across the state about geoscience.



The staple of Pick and Hammer's outreach with students has long been our Genius Box donations, which include a guided geology-themed activity box for students to perform numerous fun experiments at home. With the company that produced these boxes rebranding and discontinuing their production last year, our past officer group worked to gather the materials to build our own version of the geology activity box. Due to generous donations from RKI Energy Resources and material funding from Halliburton, we are proud to say that we were able to deliver the first several batches of our outreach boxes to hundreds of students during our school visits this year. This is a massive step forward in this project that we are excited to continue and expand in the future years.

Outside of our outreach endeavors, the 2023–2024 academic year was another exciting year for club activities for our members. Along with our monthly meetings, we were able to host numerous game nights, movie nights, rock swaps, graduate school talks, hikes, and another successful annual campout trip and quartz dig in Arkansas for the enjoyment of our members and strengthening of the community

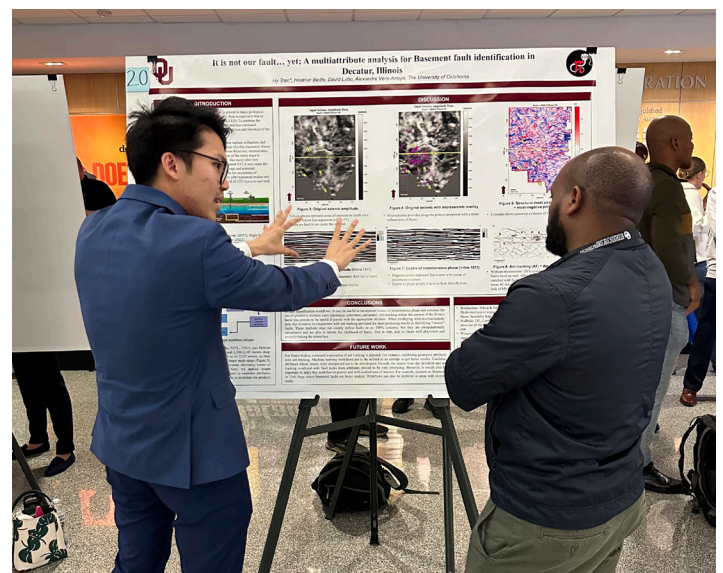
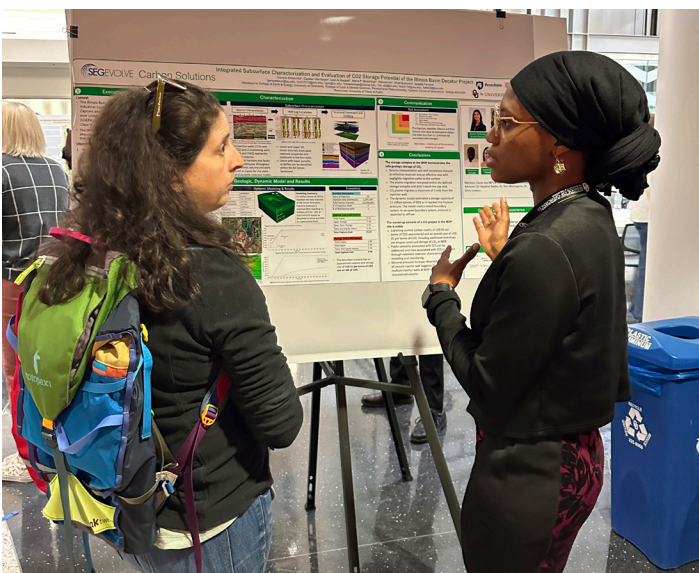
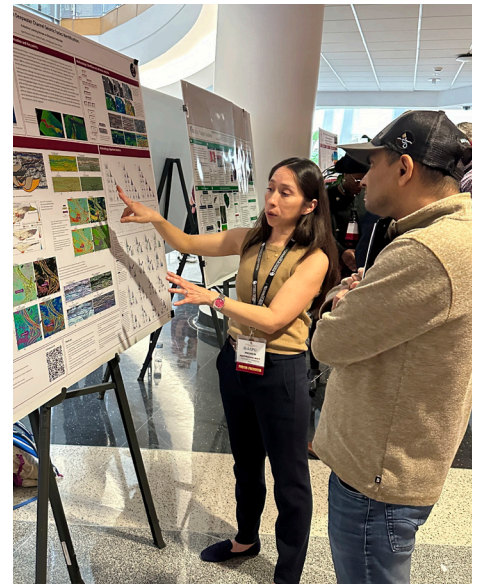
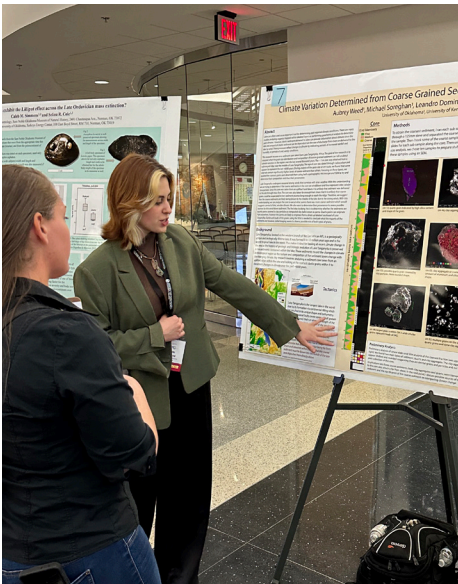
that bonds those within the School of Geosciences. We are also thankful to say that we were able to hold four more wildly successful mineral sales and auctions, in addition to our mineral auction at the Trailblazer Gala, that have provided the club with funding to fuel many future outreach endeavors to teach those all around the state about our wonderful field of geosciences, as well as award our members with exciting activities as a thank you for their constant help. We are very grateful for all who have supported us at our auction events and want to give a big THANK YOU!

Overall, Pick and Hammer was able to have another fantastic year in regard to our outreach endeavors, activities within the School of Geosciences, and building and maintaining connections around the state for the future. We have another fantastic group of officers that will be coming in for the upcoming academic year, and we are excited to keep building upon the foundations laid by the groups before and further spread our love for the geosciences in hopes of inspiring a new generation. As always, Rock and Stone!



*From left, front row: Ganiyat Shodunke, Dani Storms, Faith Grayson, Morgan Levrets. Back row: Christian Davila, Caleb Simmons, William McCraine, Danial Mansourian, Segun Bodunde, Matthew Pranter.*

# AAPG SPRING STUDENT EXPO



The AAPG Spring Student Expo was held on March 15 at the National Weather Center. Five short courses were taught by OU Geosciences, faculty, alumni and friends. In addition, seven companies exhibited at the Expo: AAPG, BP, Devon Energy, Matador Resources Co., Mewbourne Oil Co., Ovintiv and the Oklahoma City Geological Society.

Twenty-seven students presented their research in the poster competition. The Oklahoma Geological Survey served as judges and awarded the top three posters in each category prizes for their outstanding research. The Expo was largely funded by the AAPG Foundation.

The winners are as follows:

#### **UNDERGRADUATE:**

William McCraine, Christian Davila and Caleb Simmons

#### **MASTER'S:**

Dani Storms, Faith Grayson and Morgan Levrets

#### **PH.D.:**

Ganiyat Shodunke, Segun Bodunde and Danial Mansourian

# GEOSCIENCES STUDENT RESEARCH SYMPOSIUM

With the generous support of Oklahoma Geological Foundation, the School of Geosciences held the Geosciences Student Research Symposium on April 5. Students, faculty and staff gathered to learn about research projects happening in the school and to celebrate the winners with an awards reception afterward. The Alumni Advisory Council meeting was held in conjunction with the symposium, and a few alumni were able to mingle with students.

The Oklahoma Geological Survey served as judges and awarded the top posters in each category \$500 prizes for their outstanding research.

Congratulations to our students!

## **UNDERGRADUATE:**

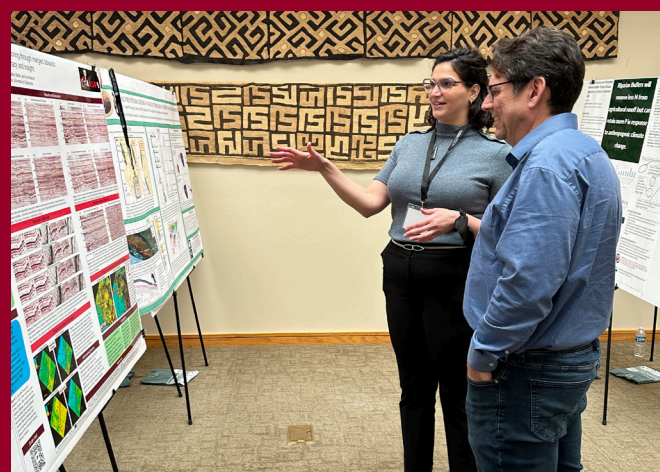
William McCraine, Aubrey Weed, Caleb Simmons

## **MASTER'S:**

A. Boyd, Pamela Blanco Dufau, Cassie Kenyon

## **PH.D.:**

Olawale Alo, April Moreno-Ward, Katherine Sluder





From left, front row: Aubrey Weed, Cassie Kenyon, April Moreno-Ward. Back row: Olawale Alo, William McCraine, Caleb Simmons, A. Boyd, Katherine Sluder, Pamela Blanco Dufau, Matthew Pranter.





# SPRING AWARDS

The School of Geosciences celebrated the end of the semester with an undergraduate vs. graduate kickball game during the annual spring picnic held at Rotary Park. With Professor Pranter serving as the pitcher for both teams, the **UNDERGRADUATES** defeated the graduate students with a close score of 13-11!

Additionally, we recognized the following students for their achievements:

## OUTSTANDING FRESHMAN:

AIDEN JACKSON, BURKE JONES AND  
MACIE MENARD

## OUTSTANDING SOPHOMORE:

EM ELDER, BEN MATSUMURA AND  
SILAS SNEAD

## OUTSTANDING JUNIOR:

BRAEDEN MORELAND

## CHARLES GOULD AWARD FOR OUTSTANDING SENIOR IN GEOLOGY:

BRYSON FETTERS



**ALAN WITTEN AWARD FOR  
OUTSTANDING SENIOR IN  
GEOPHYSICS:**  
ISSA AL AAMRI

**DAVID STERNS AWARD FOR  
OUTSTANDING ACHIEVEMENT:**  
KYLE FAKHRSHAFI

**ESTWING HAMMER AWARD FOR  
EXCELLENCE:**  
WILL MCCRAINE

**STAN CUNNINGHAM  
EXCELLENCE IN TEACHING AWARD**  
ALEX VERA

**BEN HARE  
EXCELLENCE IN RESEARCH AWARD**  
KAREN VALLES (M.S.)  
ITUNU APALARA (PH.D.)



**FRANK A. MELTON MEMORIAL  
RESEARCH AWARD**  
ANNA TURNINI (PH.D.)

**STAFF ROCK**  
DECLAN MARTIN



# GEOSCIENCES STUDENT AWARDS AND HONORS

• **April Moreno-Ward** placed first in the graduate student division at OSU TechFest.

• **Morgan Levrets and Faith Grayson** were part of the PetroBowl team that qualified for the championship competition.

• **Ben Matsumura** was awarded the 2024 Outstanding Geoscience Student Award from the Geoscience Foundation of Tulsa.

• **Faith Grayson** was selected as the recipient of the Dave Campbell Award from the Oklahoma Geological Foundation.

• **Dillon Taylor** was awarded the Black Field Camp Grant from the Oklahoma Geological Foundation.

• **April Moreno-Ward** received the Kate Graduate Fellowship from the Oklahoma Geological Foundation.

Five students each received the Oklahoma Geological Foundation Graduate Geology Fellowship:

- A. Boyd
- Cassandra Kenyon
- Morgan Levrets
- Katherine Sluder
- Alysha Zazubec

The following students were awarded field camp grants from the Oklahoma Geological Foundation:

- Kyle Fakhrrshafaei
- Bryson Feters
- David Fleenor
- Piper Jostrand
- Braeden Moreland
- Corbin Padgett
- Alyssa Pascoe
- Jacquelyn Richardson
- Caleb Simmons
- Ash Simpson
- Jaylah E. Spence



# AUBREY WEED

## \$5,000 SUMMER 2024 PROVOST'S UNDERGRADUATE RESEARCH FELLOWSHIP

Aubrey will be studying sediment cores from Lake Tanganyika and will travel to Tanzania in June to collect sediment cores from the lake.

# BRIGID BERNIER

## 2024 NATIONAL SCIENCE FOUNDATION GRADUATE RESEARCH FELLOW

This fellowship recognizes and supports outstanding graduate students who have demonstrated the potential to be high achieving scientists and engineers, early in their careers.



# ELISHA MILLER

## \$10,000 AGES-GRADUATE STUDENT GRANT

This grant will allow Elisha to determine rates of erosion and uplift of the rift mountains around Lake Tanganyika. He will do field work this summer in Tanzania to collect samples from rivers entering Lake Tanganyika and then travel to Purdue University at the end of summer to conduct cosmogenic nuclide analyses.



# BRITTANY MOEHNKE

## USGS 104B PROGRAM PROPOSAL FUNDED

This award will allow Brittany to expand her research into the sources of sediment pollution in the Lake Thunderbird Watershed. Sediment is the #1 cause of degraded water quality in Lake Thunderbird and represents a threat to Norman's primary drinking water source. Brittany's work will help city officials create best management practices that protect community and ecosystem health.







# CONGRATULATIONS TO OUR 2023-2024 GRADUATES

## **B.S. GEOLOGY**

LOGAN CRAWFORD  
NATHAN EGAN  
KYLE FAKHRSHAF AEI  
DAVID FLEENOR  
BRADY FOX  
COLBY HIGDON  
DECLAN MARTIN  
WILL MCCRAINE  
CORBIN PADGETT  
CALEB SIMMONS  
JAYLAH SPENCE  
RILEY WOODROW

## **M.S. GEOLOGY**

JACOB CLEMENTS  
BROCK DUMONT  
JACOB MAAG  
ELISHA MILLER  
BRITTANY MOEHNKE  
KATHERINE SLUDER  
KAREN VALLES

## **PH.D. GEOLOGY**

CHRISTOPHER GEYER  
AUSTIN MCGLANNAN

## **PH.D. GEOPHYSICS**

BOBBY BUIST  
KARELIA LA MARCA  
ALEX VERA

## **M.S. GEOPHYSICS**

PAMELA BLANCO DUFAU  
JOHN MCCKNIGHT  
DIANA SALAZAR FLOREZ

## **B.S. GEOPHYSICS**

SULTAN AL BALUSHI  
DAWOUD AL HASHEMI  
CHRISTIAN DAVILA



# GEOSCIENCES DAY

GAIL HOLLOWAY, RECRUITER



Geosciences Day 2024 was a great success! On March 1, the school hosted 24 students and their guests to highlight our programs, meet our professors and current students, and learn about our research opportunities. High school and two-year community college students were invited to attend from all over Oklahoma and the surrounding states, and attendees represented a variety of majors and grade levels. This year, over a third of the participants were potential transfer students from Oklahoma two-year colleges.

A generous grant from the Oklahoma Geological Foundation allowed us to provide participants with a quality experience. We started the day with an information session, presenting the highlights of the undergraduate experience in the school and allowing participants to ask questions. The student panel was a definite highlight! Seven current undergraduates representing all the different majors within the school, ranging from freshmen to seniors, talked about their experiences within the school. One even was a participant in last year's Geosciences Day – he said it was a little surreal to be on the other side of the event. It is always so fun to hear these students talk about their experiences! The informal lunch allowed participants to talk one-on-one to students and faculty. All four of the school's clubs had tables at the lunch, allowing them to showcase their events, interests and activities. At least eight faculty, eight club officers and numerous current students attended to talk to participants and partake in lunch.



”

## GREAT EVENT, I REALLY WANT TO APPLY NOW!”

As in previous years, the majority of the day served to highlight the labs and research facilities. With the wide variety of professors participating and disciplines represented, we had something for all aspects of the geosciences. Before lunch, students started with the Geophysics lab on the 14<sup>th</sup> floor, where graduate students for Heather Bedle and Junle Jiang showcased real-world applications of geophysical techniques. For the afternoon, students rotated through seven different research spaces. Brett Carpenter demonstrated stress relationships,

Shannon Dulin magnified samples in the SEM, Andrew and Megan Elwood Madden showcased different methods of mineral identification, Caitlin Hodges worked with soil samples, Matthew Pranter showed core samples, Sina Saneiyan demonstrated the usages of ground-penetrating radar and drones, and Mike Soreghan discussed climate and sedimentation. With so many students interested in paleontology, we offered a new lab tour this year. By adjusting the end time of the event, we were able to offer an optional tour of the research labs at the Oklahoma Sam Noble Museum of Natural History led by Lena Cole and Davey Wright. This proved to be exceedingly popular! We very quickly filled the initial tour slots but were able to expand to include everyone who was interested.

The lab tours, and specifically the Sam Noble tour, were the definite highlight of the day for the attendees. One student wrote that their favorite part was “Going

to the museum and seeing how students use the museum to do research,” and another wrote that their highlight was “Seeing all the different labs.” My favorite comment was “Great Event, I really want to apply now,” as this was definitely our goal with hosting the event!

After three years of hosting this event, it is wonderful to see the impact it has on undergraduate recruiting. From our first year in 2022, 25% of those attending matriculated at OU as freshmen that fall and another 12.5% applying for the following fall. These numbers increased in 2023, with 32% of the participants starting that fall as freshmen and another 10% applying the following fall. This year, 21% are committed to start at OU this fall as freshmen, with hopefully more applying in the future. Transfer students are a little harder to track in the OU systems, but hopefully many of this cohort will also be students in our school in the semesters to come.



# NEW GRADUATE STUDENT FIELD TRIP

**MILLY HENCEY, M.S. STUDENT**

This fall the new graduate students went on the annual trip to the Arbuckle Mountain Region of Southern Oklahoma. The trip was led by Sarah George, Matthew Pranter and Brett Carpenter. The objective of this field trip was for new graduate students to learn about Oklahoma geology since the majority of new graduate students in the OU School of Geosciences are from other states.

The stops included a working quarry to see the basement rock of Oklahoma, an outcrop of the Woodford Shale, Turner Falls, a fossil rich outcrop, and a rabbit ear anticline on the side of I-35. The basement rock is 1.48Ga in age and consist of granite and rhyolite with sills and dikes cutting through them. The Woodford shale is an extensive shale unit seen in the Arbuckle Mountains Region. This shale has been rotated so its bedding is practically vertical. Turner Falls is not just a beautiful stop, but is has some unique features. Rip up clasts are visible on the ground which, show mud clasts that were lithified into the rock. Additionally, an outcrop with limestone and chert shows how differing rock compositions exhibit differing deformation styles from the same event. The many faults within this outcrop create a great example of this and the chert can be seen showing brittle deformation while the limestone shows ductile deformation. The fossil rich outcrop in Southern Oklahoma was composed of crinoids, trilobites and so much more. Lastly, the rabbit ear anticline is a plunging anticline in this region that has a reverse fault cutting through it. This causes an offset in the middle of the anticline with resembles a rabbit ear.

This field trip was effective in teaching new graduate students about the geology of Southern Oklahoma. The diversity of this region provides many excellent examples of structural geology, paleontology, etc., for students to learn from.








# OROGENIC SYSTEMS FIELD TRIP

BRIGID BERNIER, M.S. STUDENT



This past fall 2023, I enrolled in the graduate Orogenic Systems class. In this course we learned about the tectonics of large mountain systems generated by plate subduction. In October, I had the opportunity to go on a five-day Montana field trip with the class to visit the features we were learning about, camp and gain more field experience.

The class and our instructors, Drs. Sarah George and Gilby Jepson, all flew up to Montana and set out to explore the tectonics of the North American Cordillera. The first night we stayed at a campsite in the Sawtooth Range, a series of mountains in the fold-thrust belt of the orogen. That night, after a short lecture, we teamed up to cook dinner outside and look at the stars around the campfire. For many of us this was one of our first times seeing the Milky Way. The next day we completed a short hike to get a good viewpoint of the fold-thrust belt structures and then drove through the mountains, making stops at faults and folds as we completed a structural map of the area. We then drove into the foreland basin to compare the structures observed there and to complete a cross section of the fold-thrust belt through the foreland basin. We then made stops at the Idaho batholith, the Absaroka volcanics, the 18 km thick Mesoproterozoic Belt Supergroup, and Basin and Range normal faults. Our next major stop was the Bitterroots, a metamorphic core complex. We camped beneath the massive uplift and did a short hike where we learned

how to draw field sketches of mylonite and take notes on metamorphic features in the field. Our final stops were at Laramide structures and growth strata, which are coarse conglomerates deposited on top of actively deforming areas. This was my favorite stop in the trip because it relates to my research but is something I hadn't recognized in the field before.

We covered a lot of different features and visited a lot of Montana on this trip. Seeing everything in-person positively impacted my learning for the rest of the semester because I could relate more in-depth information in class to what I had seen in the field. We also each gave a field presentation on a paper related to major stops, which was a good learning experience. The best part about this trip was that it helped me develop a close group of friends and connect with the other geology graduate students. Camping and fieldwork are good bonding experiences, because of the time to connect with limited Wi-Fi, the new environment and memorable stops. I'm glad I had the opportunity to see so many different mountain landscapes with other students who are now close friends. I also felt like this was a trip where I had many "aha!" moments about features I had learned about or seen in the past that hadn't clicked for me. Visiting such a range of environments helped me compare things and recognize the patterns in the landscapes more easily. I'd recommend others participate in a field experience like this if they can.

# FIRST-YEAR FIELD TRIP

CHRISTOPHER ALBERT, UNDERGRADUATE STUDENT

## DAY 1



**Day 1:** *Journey to Cañon City:* Our adventure began with a scenic drive from Norman, Oklahoma, to Cañon City, Colorado. Along the way, we got to see some of New Mexico's incredible volcanic landscapes. A highlight of our trip was the Cretaceous-Tertiary (K-T) Boundary, where our professors' insights sparked a flurry of student questions. Arriving in Cañon City, our accommodations for the week were nothing short of spectacular, which included hot fresh meals, a nice latrine and awesome cabins.

**Day 2:** *Exploring Cañon City:* We embarked on day two with a tour of Cañon City's geologic wonders. We traced the footsteps of Ankylosaurid dinosaurs on Skyline Drive and admired the stark contrast of basaltic dikes against the Arkansas River on Tunnel Drive. We also got to hike up to "High Camp" and see

some incredible scenery. The day concluded with a hearty meal courtesy of camp chefs Bob and Carolyn and a little time to get to know each other as geology students.

**Day 3:** *Great Sand Dunes and Zapata Falls:* The university vans carried us westward to the awe-inspiring Great Sand Dunes National Park and possibly one of the coolest places that I have ever seen at Zapata Falls. The dunes, a testament to nature's artistry, were shaped by conflicting predominant and storm winds mixed with streams carrying sediment from the Sangre de Cristo and San Juan Mountains. The next stop, Zapata Falls, was my personal favorite stop during the entirety of camp. It offered a tranquil respite with its frozen waterfall and incredible stream flowing from it. Our return trip allowed us to see the awe-inspiring



# DAY 2



# DAY 3

# DAY 4



**Day 4: Garden of the Gods and Red Rock Canyon:** The fourth day was a tapestry of natural splendor, featuring the Garden of the Gods and Red Rock Canyon. The Garden's geological formations, from the ancient Fountain Formation to the Cretaceous Pierre Shale, were a geologist's dream. Red Rock Canyon, with its historic quarry etched into the Kenmuir Sandstone Formation, provided a glimpse into the past and allowed us to see some of these geologic formations from the inside

**Day 5: Florissant Fossil Beds and Mollie Kathleen Mine:** The final full day in Colorado brought us to the Florissant Fossil Beds, where volcanic eruptions and lahars preserved giant redwood remnants. The day's journey continued underground at the Mollie Kathleen Mine, where we dove into the miners' world a thousand feet below the surface. Our final night in Cañon City was a reflective one, as we talked about our shared experiences and received some expert advice on proceeding and getting ready for graduate school.

# DAY 5



**Day 6: Farewell to Colorado:** Our last day began with the breaking of dawn. After breakfast, we packed our bags and packed lunches and set off back towards Norman. The week's geological explorations, from basaltic intrusions to fossilized forests, enriched us beyond measure. Experiencing the wonders of the world is an incredible and effective way to learn about the world and geology. Seeing geologic 2D representations of an intrusive dike compared to one that you can see, and feel is almost noncomparable.



# DEPOSITIONAL SYSTEMS AND STRATIGRAPHY FIELD TRIP

## BRAEDEN MORELAND, UNDERGRADUATE STUDENT

This past fall semester, the Depositional Systems and Stratigraphy (GEOL 4113) class embarked on their annual four-day trip exploring the Sacramento and Guadalupe Mountains of New Mexico and Texas with Professor Steve Adams taking the reins and leading the class out into the field. Professor Adams led students through various geology stops and activities highlighting the sequences of rock deposited in numerous environments during a highly dynamic interval of Earth's history from the Mississippian through the Permian in this portion of paleo-equatorial Pangaea. The beginning of this trip was highlighted by an evening visit to White Sands National Park that allowed students to see a modern analog to the aeolian depositional environments discussed in class, recognize how dunes and aeolian processes are preserved in the rock record and witness a beautiful fiery-red sunset over the mountains to the west. The next highlights of the trip came from measuring a stratigraphic section in La Luz Canyon and seeing giant marine algal-microbial mud mounds. The stratigraphic section activity allowed students to recognize transgressive and regressive marine cycles in the rock record while also preparing students with the necessary skills to successfully measure and describe section for stratigraphic columns at field camp. The most prominent highlight of the trip was the exciting hike up the Permian Reef trail in Guadalupe Mountains National Park. Students were able to trek up an entire preserved reef and identify and characterize each part of the depositional structure of the carbonate marine system. This trip allowed students to enjoy a third national park – Carlsbad Caverns – before making the journey back to Norman. Overall, this entertaining trip successfully allowed students to further explore and better understand course topics, especially the influence of tectonic, sea level, and climate changes on depositional environments and the biosphere, while gaining necessary experience in the field.





# OU SCHOOL OF VISUAL ARTS VISITS BARTELL FIELD CAMP

**ROBERT BAILEY, PH.D., WITH PHOTOGRAPHS BY TODD STEWART, PH.D.**

This May, 10 undergraduates, two graduate students, two faculty members and one staff member from the University of Oklahoma's School of Visual Arts formed an irregular convoy crossing the plains. Having departed from Norman, they were on their way to Cañon City, Colorado, to spend two weeks with their counterparts in geology learning, thinking, writing and, of course, making art about the environment in which they would soon find themselves. "What exactly are we doing again?" the students asked from the back seat. "I don't know. You'll figure it out when we get there," came an un reassuringly vague answer from their teacher.

Since 2015, OU faculty Todd Stewart, professor of art, technology, and culture, and Robert Bailey, associate professor of art history, together with media equipment technician, Brent Goddard, have taken students on road trips from OU's main campus to the arid west of the United States to do fieldwork, make art, gather knowledge and think critically about place and time. Eventually, they transform what they do into exhibitions that combine images, texts, artworks, sound, found objects, research materials and more into installations that invite visitors to reflect on the human relationship to nature and the traces that people's activities leave on it.

This time out, the group, dubbed Fieldworks, left its tents at home in favor of the cabins at the Bartell Field Camp, where OU Geology students learn to do fieldwork. A base of operations presented certain advantages over darting from campsite to campsite. Advance assurance of where each night's bed lay created a relaxed frame of mind conducive to the creative process. Remaining in central

Colorado afforded a depth of engagement attuned to the rhythms of a single place. Day-trips to museums in Denver, Great Sand Dunes National Park, Bishop Castle and the historic mining town of Leadville refreshed understanding of the area with new perspectives. Above all, working closely with geologists in and out of the field provided opportunities to understand the environment across bridges built between the arts and the sciences.

Over two weeks, art students figured out why they were at a scientific field camp by living, dining and learning together with geology students. They found much to discuss about topics of mutual interest, especially vision and observation. The geologists showed the artists how they map the land, which involves ways of looking also used when analyzing artworks in an art history classroom. In return, Haley Cytacki, an OU drawing instructor who visited Cañon City partway through the trip, led the geologists in drawing exercises that sharpened their perception and representation of landscapes and the rocks that give them their form.

On their last night at Bartell, the art students held an open studio in the dining hall to share the preliminary results of their work: sketches, notes, animations, photographs, paintings, sculptures, videos, ideas and more. The art students planned to take the rest of the summer or the coming fall semester to refine these efforts into finished projects or papers. An exhibition will come from all of this (stay tuned), but in the meantime, the School of Visual Arts and Fieldworks are grateful to Geology and the Bartell Field Camp for the hospitality they showed and look forward to more collaboration in the future.

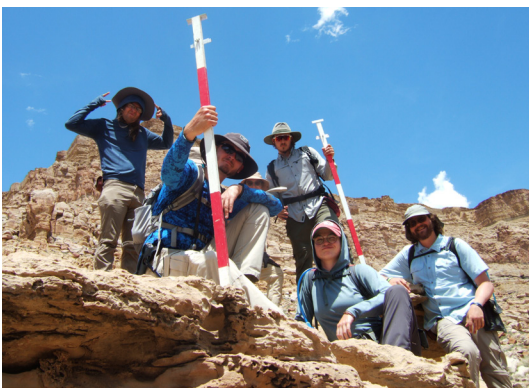
# BARTELL FIELD CAMP

SHANNON DULIN, PH.D.

At the end of June we wrapped up another successful field season at Bartell Field Camp, and a fourth year of the online digital mapping class! This year the geology students at Bartell were joined by the School of Visual Art (SoVA) from OU, which led to a collaboration that I hope will extend well into the future. Students from both schools learned the shared importance of observation as a basis of work, whether it be sculpting, comic book illustration or geologic observation of rock properties. It was more than gratifying to observe the students teaching each other their (sometimes newly learned) skills, and learning where those skillsets overlap in the seemingly disparate world of geology and art. Unexpectedly, one of our daily tasks in the field was to gather local rocks that were then ground into pigments that became watercolors used by the SoVA students to create artworks that were displayed on our final evening together.

Our field students were treated again to a regional trip taking them through Utah, which highlights the structural differences between the Laramide deformation in the Cañon City Embayment and the thin-skinned Severe deformation. Students also enjoyed some unseasonably mild days during mapping of our usual suspects: the Mixing Bowl and Grape Creek. Lest students get too comfortable, the gnats were out in full force to make mapping slightly more challenging!

The online digital mapping class was able to experience many of the same locations the field students did thanks to our robust curriculum that was originally





developed in 2020. We augmented this experience with additional GIS mapping of Mars and Moon, allowing students to travel to unknown, yet still familiar, stratigraphies to create strat columns and cross-sections. By interpreting geologic maps, and then augmenting them with their own mapping, students learned some of the geologic processes that helped to shape the inner planets of our solar system.

This field season at Bartell Field Camp also marked the last year our camp chefs, Bob and Carolyn Likens, would be fueling our adventures with their homecooked meals! Bob and Carolyn are departing for much greener pastures at their cabin along the shores of the Lake of the Ozarks in Missouri. Their absence — especially the absence of Bob's famous cinnamon rolls! — will be lamented at Bartell Field Camp next year.

Our field students were treated again to a regional trip taking them through Utah, which highlights the structural differences between the Laramide deformation in the Cañon City Embayment and the thin-skinned Severe deformation. Students also enjoyed some unseasonably mild days during mapping of our usual suspects: the Mixing Bowl and Grape Creek. Lest students get too comfortable, the gnats were out in full force to make mapping slightly more challenging!

The location of Bartell Field Camp as a base of operations allows students to map and compare styles of deformation and a breadth of stratigraphy that some geologists never get to see in-person. As these students progress in their geological careers, they will look back on their experiences here and understand the importance of a field education, and the privilege of having spent time at this world-class field station.





# ALUMNI FIELD CAMP

The second annual Alumni Field Camp was held at Bartell Field Camp in Cañon City, Colorado, on June 13-14.

As alumni arrived in Cañon City, we enjoyed an incredible dinner prepared by Bartell Field Camp chefs Bob and Carolyn Likens. Dean John Antonio and director Matthew Pranter gave updates on the Mewbourne College of Earth and Energy and the School of Geosciences. One very special announcement was the creation of the inaugural Chris J. Cheatwood director fund – awarded to Bartell Field Camp director, Shannon Dulin! This generous gift, provided by Chris and Cathy Cheatwood, will help continue the legacy of Bartell Field Camp by enhancing the student experience, improving camp facilities and supporting the field camp director.

After an evening of reunions and reintroductions, Saturday kicked off with an excursion to a few field camp favorites: Skyline Drive and Grape Creek. We headed back to camp for an afternoon filled with Bartell Field Camp updates from Shannon Dulin, facility and cabin tours, and a special paleontology program update from Jacqueline Lungmus.

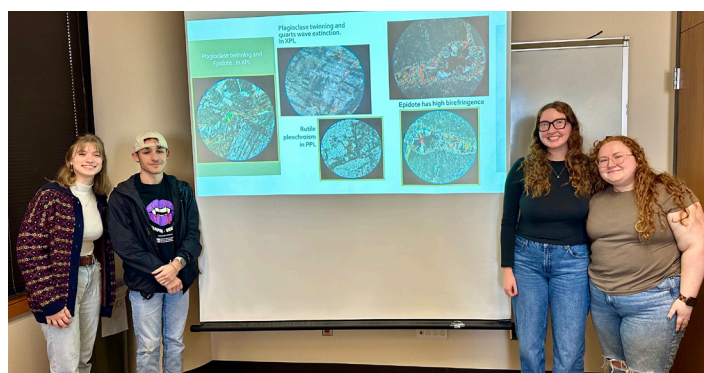
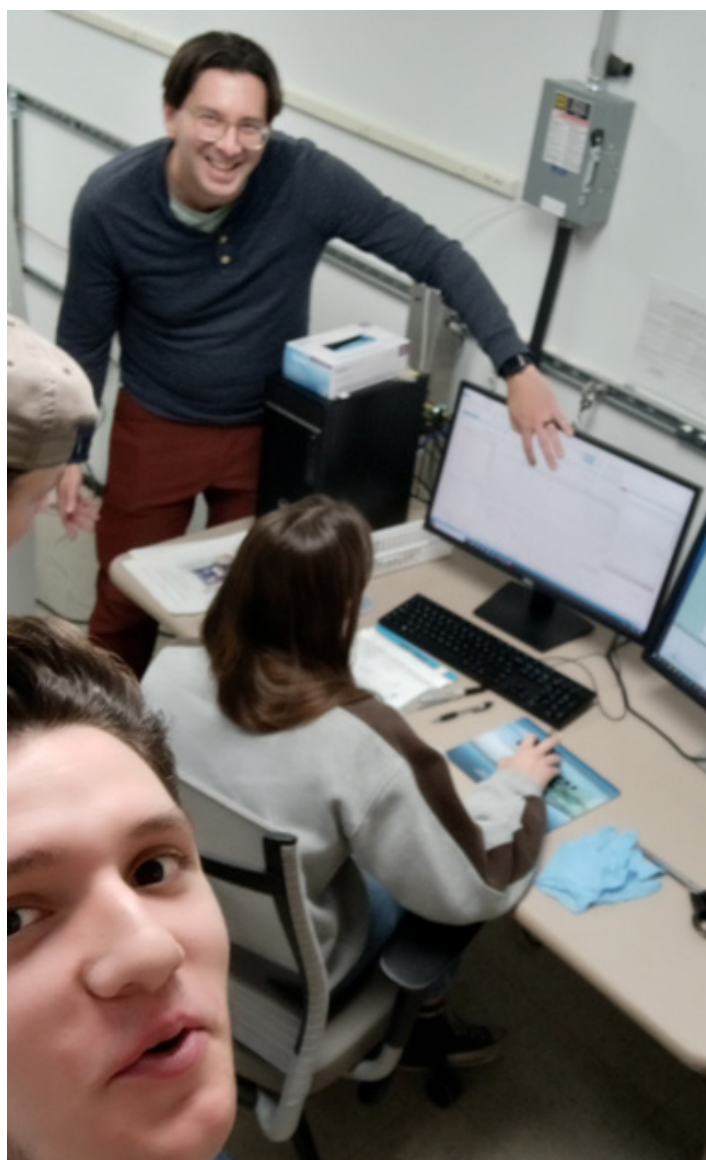
As the students returned from their regional field trip in Utah, they introduced themselves to alumni and all enjoyed a meal from local favorite, Pizza Madness!

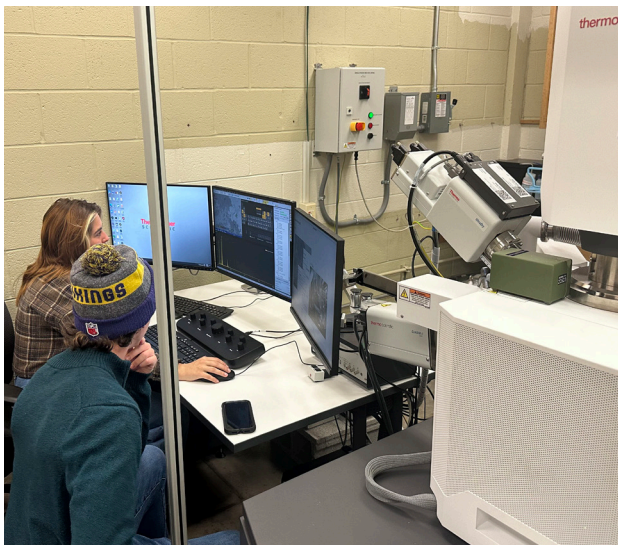
The event was led by Rhesa Brewster, executive director of advancement for the Mewbourne College of Earth and Energy, Colin Pitner, development officer for the Mewbourne College of Earth and Energy, and Lisa Tucker, donor events specialist for the OU Foundation in coordination with Shannon Dulin, Steve Adams and Ashley Tullius. A special thank you to these folks for their efforts in coordinating logistics and helping create a successful event for our alumni.



# LASERS, X-RAYS AND ELECTRONS OH MY! MINERALOGY STUDENTS EXPLORE MINERALS WITH A RANGE OF TOOLS

ANDY ELWOOD MADDEN, PH.D., AND KATHERINE SLUDER AND BROCK DUMONT





How many of us have picked up a rock and wondered, "what's this made out of?" Identifying minerals, their associations and textures is a critical aspect of being a geoscientist, whether it be casual curiosity, a component of a fundamental research project, or an applied part of a work activity in a range of job environments. The traditional semester-long process of learning to identify hand samples and thin sections continues, making use of OU's wonderful hand sample teaching collection, including those that have been donated by OU alums. Additionally, in 2021, the GEOL 2224 Introduction to Mineral Sciences course started a new semester-long laboratory project to introduce the students to equipment and methods of mineral analysis common across many industries and labs in a hands-on exploratory fashion, leveraging OU's state-of-the-art research equipment.

It all starts with students bringing in rocks – better if the collection locality is known, and essential that specimen visibly contain several different minerals. This year, several students brought in rocks they collected on the School of Geosciences first-year field trip, including some near the Bartell Field Camp. Students were organized into groups of two to four within their lab sections, and each group assigned one rock (each group including the person who collected it). The goal of the project is to use a range of methods (petrography, scanning electron microscopy with X-ray spectroscopy (SEM-EDS), powder X-ray diffraction (XRD), and Raman spectroscopy) to identify the minerals present in each rock. This is a collaborative process with no answer key. Everyone could work with anyone in their group or any other group, but required to present the data and interpretation from their assigned method(s).

Within the first two to three weeks of the semester, splits of the rock samples are sent to Grindstone

Labs to be made into thin sections. About halfway through the semester, we have a lab to pulverize and micronize a sample split for Powder X-ray diffraction and mount samples for scanning electron microscopy. The following week, we had lab at the Samuel Roberts Noble Microscopy Lab ([microscopy.ou.edu](http://microscopy.ou.edu)) and I worked with groups on the XRD while Dr. Preston Larson from the SRNML helped students get started driving the SEM and collecting data on their rock chips and thin sections. Students were invited to come back and work with Preston (big thanks to Preston) later if they wanted additional data. Students also collected reflected light images of their samples with the Keyence Ultramicroscope. The next week, students collected data on the Geosciences Raman microprobe (thanks to Dr. Megan Elwood Madden). Throughout, students were collecting images and videos of their thin sections using the petrographic 'scopes.

Students then synthesized their data into presentation format, thinking about the geologic context of the collection locality, and comparing and contrasting which minerals were identified with the various techniques. Most students worked hard and had fun bringing their creativity to their presentations. Of course most samples included the major rock-forming silicates, but many other minerals were found, from tourmaline to Sm-monazite and beyond!

The mineralogy lab class projects provide students opportunities to learn mineralogy by being geoscientists: sharing data and collaborating with their research team using Microsoft Sharepoint, practice collecting, analyzing and presenting data, and integrating different types of data from complementary methods. One thing is for sure – it's always exciting to have the chance to learn more about each and every rock, and many new mineralogical adventures await!



# RESEARCH OPPORTUNITIES IN ROCK DEFORMATION: A SUMMER RESEARCH EXPERIENCE FOR UNDERGRADUATES

**BRETT CARPENTER, PH.D.**

*"R.O.R.D. is designed to introduce undergraduate students from diverse backgrounds in earth science, geoscience and engineering to the field of rock deformation, even if they've never heard of it before!"*

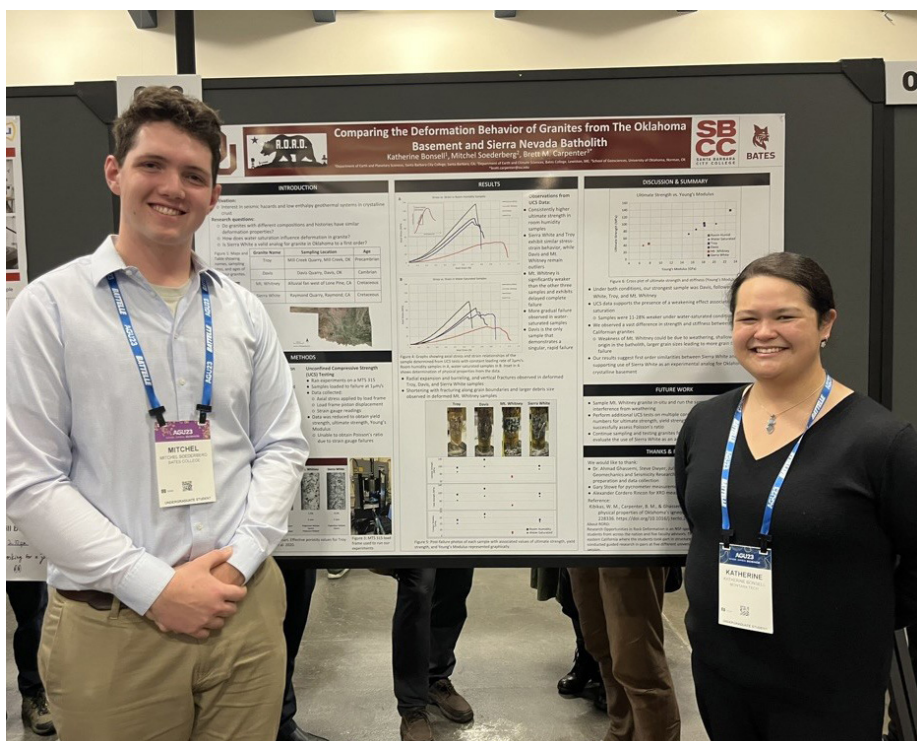
The RORD project is led by PIs from the University of California – Santa Cruz, University of Minnesota, and Washington University in St. Louis. Each spring (2022–2024), the PIs of the project select 10–12 students, who are paired up and sent to one of 11 rock deformation host labs around the U.S. Prior to the lab session, the students spend nine days in the Eastern Sierra Mountains learning basic structural geology and collecting samples to be used during the lab session. In December, the students attend

the American Geophysical Union (AGU) National meeting to present a poster on their work. Undergraduate students are financially supported during each part of the RORD experience.

Over the course of six weeks in June and July 2023, I hosted two undergraduate students, Katherine Bonsell (Montana Technological University) and Mitchel Soederberg (Bates College). Both Katherine and Mitchel expressed interest in eventually pursuing a M.S. in geosciences, but wanted to better understand what rock mechanics

research involved. Further, they arrived in Norman with different levels of background coursework and research experience.

During their time in Norman, in addition to their experiments, which I'll mention below, I worked with Katherine and Mitchel on topics ranging from structural geology to research ethics to professional development to applying for graduate school. In addition to the lab experience, we took field trips to Mill Creek, Oklahoma, and OGS's Oklahoma Petroleum Information Center.



*"RORD was my first research experience and I enjoyed going through the lifecycle of a research project in just a few months. It was nice to focus on our research and experience summer in Norman without having to juggle classes. I had no prior knowledge of rock mechanics and I enjoyed learning about it hands-on. I also liked seeing and working in the research facilities at the Sarkeys Energy Center, and getting to meet a variety of faculty, lab techs, postdocs and graduate students at OU. My highlight was preparing the core samples for the UCS tests and seeing them get crushed in the load frame!"*

**-Katherine Bonsell**



In order to give them the full Oklahoma experience, we also had Arbuckle Mountain Fried Pies and went rose rock collecting, among other social experiences.

After discussing several project options with them, we decided to do a comparative study between Sierra Nevada and Oklahoma granites. Their project was titled "Comparing the Deformation Behavior of Granites from The Oklahoma Basement and Sierra Nevada Batholith. In order to complete this study, Katherine and Mitchel prepared, characterized

and deformed the samples. This meant they learned how to core and parallel grind, how the XRD and Pycnometer work, how to build small electronics for data collection, how to perform the experiments, and how to analyze the results. Such a broad interdisciplinary experience would not have been possible without the help of my colleagues, Ahmad Ghassemi, Chandra Rai and Andrew Elwood Madden. After a summer of data collection, they authored and presented a poster at the 2023 AGU meeting.

In working with these two students, I was really reminded of the excellent facilities and collaborative environment we have here at OU. Our students have access to these every semester. For students like Katherine and Mitchel, they had to apply to a competitive program be selected to get these experiences. In preparing this article, I reached out to Katherine, who since her experience here has gone on to be named a 2024 Barry M. Goldwater Scholar.

# GEOPHYSICAL PROBE INTO MULTISCALE SOLID EARTH PROCESSES AND HAZARDS

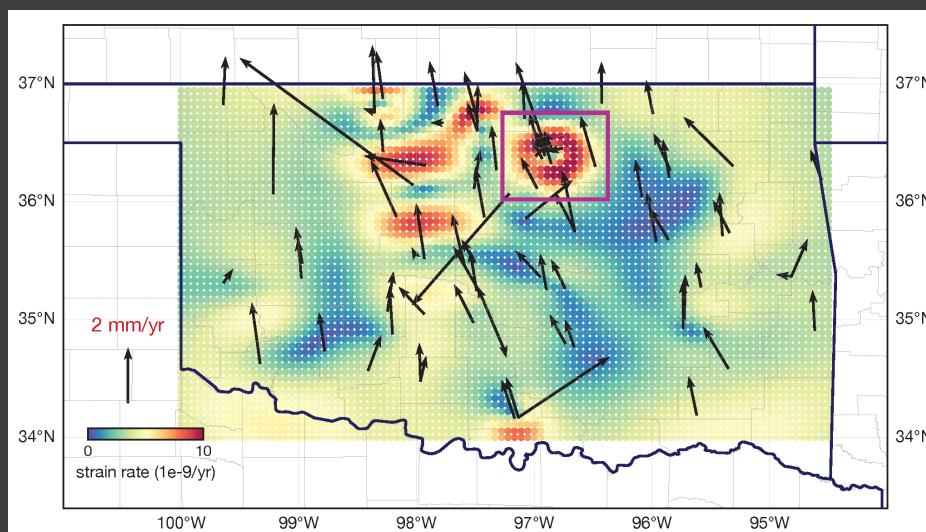
## JUNLE JIANG, PH.D.

In the *Crustal Dynamics and Computational Geophysics Group*, we use observational and computational approaches to study dynamic processes and properties of the Earth's lithosphere over different scales and settings. Our research tools include satellite-based geodetic techniques,

seismological observations, and geomechanical modeling. The seismo-geodetic perspective allows us to study the wide spectrum of crustal phenomena; integrating diverse datasets and physics-based models facilitates predictive understanding and potential forecast. These advances are crucial to addressing many problems related to the complex solid Earth system and associated hazards and risks.

Over the past year, our research group supported three Ph.D. students, one M.S. student, and three undergraduate student interns. All graduate students presented their research at several national and regional conferences, including the AGU (American Geophysical Union) Fall Meeting in San Francisco (Dec. 2023), the SSA (Seismological Society of America) Eastern Section and Annual Meetings in Dallas (Oct. 2023) and Anchorage (April 2024), as well as the SEG/SPE/SPWLA Workshop on OU campus (Mar. 2023), thanks to partial travel support from the OU Robberson Travel Grants, Graduate Student Senate, and the school. Together, we cover topics ranging from seismicity, faults, fluids, subduction zones, geothermal fields, landslides, community science, etc. Our students also helped promote the school and connect with prospective students at the AGU exhibit booth. Three undergraduates from OU and other universities (in China and Kenya) have completed their research projects about slow slip of faults in California and induced seismicity in Oklahoma and Texas.

In particular, we welcomed two new graduate students, who have made excellent progress in their degree coursework and research. Ph.D. student Manoj Thapa, co-advised by Netra Regmi, Ph.D., of the Oklahoma Geological Survey (OGS), studies the characteristics of landslides in Oklahoma and Japan using a large amount of satellite imagery, with the goal of understanding the effect of ground shaking



*Figure 1. Average strain field in Oklahoma derived from GPS movements (black arrows).*

and precipitation on landslide occurrence. M.S. student Jose Viteri Lopez explores the probabilistic models of several subduction zone megathrust earthquakes in South America and Asia. Jose and Ph.D. student Segun are also involved in a new project about crustal strain, earthquakes and fault interactions in Pawnee, Oklahoma. We have used the entire GPS network in Oklahoma to construct the strain fields over the state (Figure 1). We particularly focus on the spatiotemporal evolution of seismicity on faults in the Pawnee region, which hosted an M5.8 earthquake in 2016 and intermittent microseismic episodes since then (Figure 2). Given the diverse interests and knowledge in the group, we look forward to more collaborations among students and other researchers in the coming years.

Beyond the group, we are enthusiastic about collaborations in the department and with the OGS

and other institutions (e.g., TAMU and UC Berkeley). These collaborative projects tackle problems ranging from earthquake swarms in California and Hawaii to seismicity and landslides in Oklahoma. We are grateful for funding from the NSF (National Science Foundation), NASA (National Aeronautics and Space Administration), SCEC (Statewide California Earthquake Center, an NSF- and USGS-funded multi-institution consortium), and OU DISC (Data Institute for Societal Challenges). While our research projects are diverse in topics, scales and settings, a common theme is deepening our understanding of the interplay between the crustal structure, strain, stress, seismicity and/or fluids. We hope these projects will foster critical thinking, analytical skills and creative problem-solving in our students and mentees.

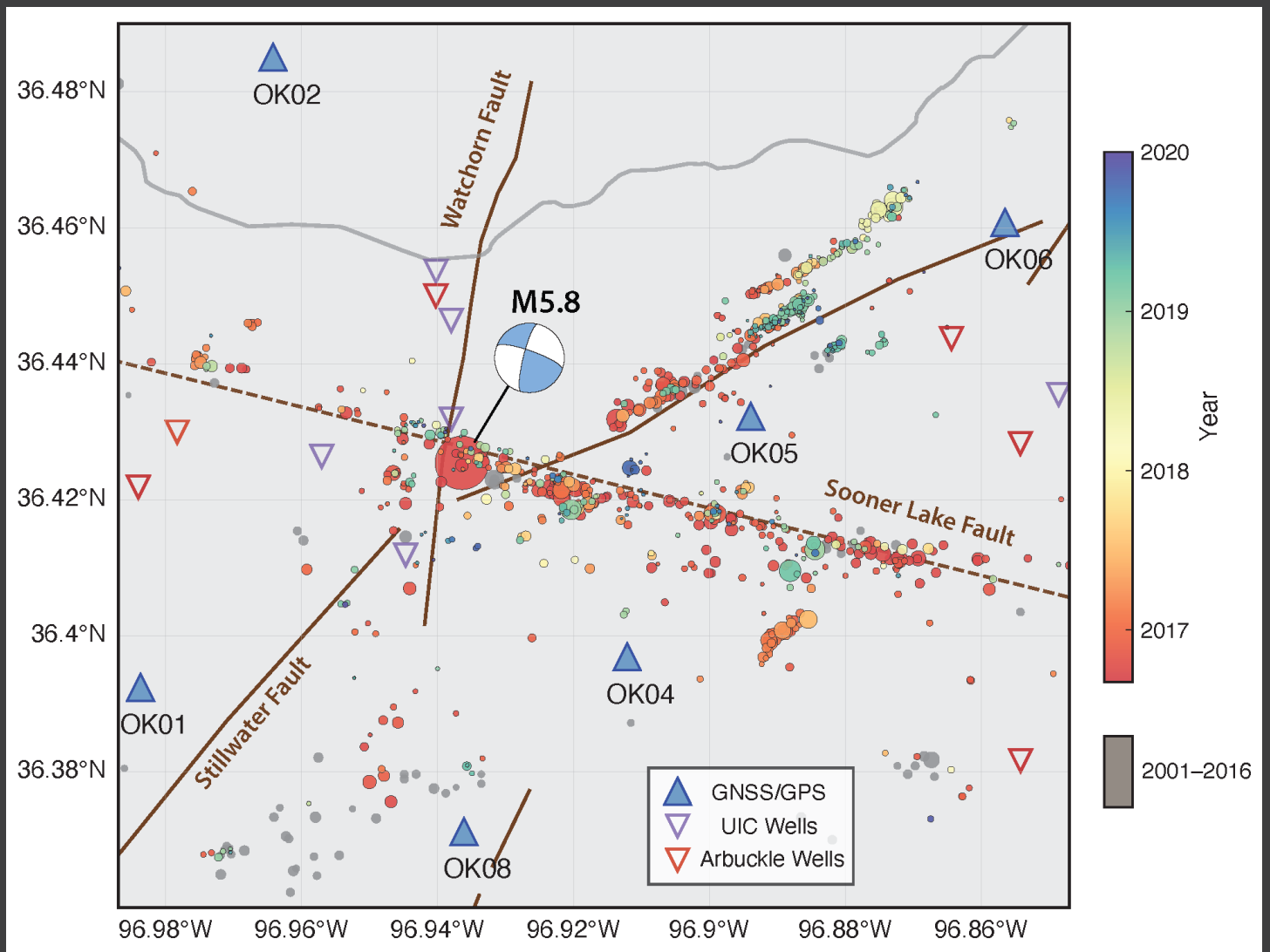


Figure 2. Seismicity evolution and fault reactivation in Pawnee, Oklahoma.



# PROGRESS ON DEEP DUST: ESTABLISHING A GEOCHRONOLOGY FOR THE PERMIAN OF OKLAHOMA

**LYNN SOREGHAN, PH.D.**

The Deep Dust Project is an ongoing effort to build support to recover research cores from the Permian of Oklahoma. It is an international project, which I lead but involving many collaborators from OU and other institutions across the U.S. and world. To date, Deep Dust has amassed partial support for drilling operations from the International Continental Drilling Program, and U.S. National Science Foundation, and the science foundations of Germany and Japan, to begin the first of two planned cores— one in the Anadarko Basin, and one atop the buried part of the Wichita uplift. The unique geology of Oklahoma enables this paired approach to assessing both the lowland and upland of this fossil landscape. Both cores would recover the complete Permian interval — an enormous undertaking, but one that would revolutionize our understanding of this remarkable time period in Earth history, and provide reference sections for generations to follow. The Permian Earth System sustained enormous environmental changes — e.g., Earth's only example of the collapse of an icehouse on a vegetated planet, and Earth's largest extinction event.

The difficulty of investigating the transformative events of the Permian is in finding a stratigraphically complete record. To date, it's been thought that the Americas — the entire western hemisphere, actually — host only an incomplete record of the Permian. But new data suggests that such a record is preserved in Oklahoma — all the way through the Permo-Triassic boundary. To further assess this, I conducted work with colleague Jahan Ramezani (MIT) to sample both outcrop, and the limited core that exists from Permian strata of Oklahoma and the Texas panhandle in an attempt to refine the chronostratigraphy of the Permian. The Permian of Oklahoma remains poorly dated because exposures are limited, and much of the strata exposed at the surface are barren of dateable material such as fossils and ashes. But careful sampling has revealed evidence for dilute ash material, which Jahan will be analyzing at the MIT lab. Stay tuned.



# HOW OLD IS LAKE TANGANYIKA?

**MICHAEL J. SOREGHAN, PH.D.**

The Sun hung over the Congolese mountains across Lake Tanganyika, bathing the mud-clad village perched beside the canyon mouth in a vibrant tawny-orange glow. Ph.D. student Elisha Miller and I, along with Jonah, a young Tanzanian scientist, and two local guides, had just emerged from the canyon after an exhausting seven-hour hike, mostly using the river as the trail and negotiating thigh-high water and rapids. We were there to collect river sand from watersheds of the rift-flank mountains that make up the Tanganyika rift. We climbed into our small dinghy after thanking the guides and playing a bit of football with the village kids on the beach, and motored out to the R.V. Echo, where we slept on the deck after a hearty bowl of chicken stew. The next day, after a less appealing bowl of fish stew for breakfast, we cruised down the Tanzanian coast, collecting bags

of river mouth sands from several other watersheds along the mountain front before returning to the port town of Kigoma, Tanzania.

Elisha and I were at Lake Tanganyika beginning research on a project newly funded by the National Science Foundation in collaboration with OU assistant professors Sarah George and Gilby Jepson. Lake Tanganyika lies within the East African Rift, which serves as the type example for a modern continental rift — diagramed in almost every introductory geology textbook. The Tanganyika rift consists of seven large normal fault segments that flip-flop down the rift axis forming half-grabens with high-relief uplifts, deep, sediment-filled basins, and highly variable geomorphology. This geometry is well understood from previous seismic surveys and structural studies. However, there

is a fundamental unanswered question: how long did it take for these faults to form? That is — how old is this part of the rift? And did the faults form contemporaneously, or did the rift “unzip” in a directional pattern?

The new research project is designed to try to answer these and other related questions. To constrain the question of the age of the rift we are using thermochronology, specifically detrital thermochronology — hence the huge bags of sand collected within the rivers. The sand — and specifically fission tracks entombed in the apatite grains in the sand — can reveal timing of the fault-related uplift if read and analyzed correctly. This thermochronology research should produce the first geologic constraints on the initiation and growth of normal fault uplift along the Tanganyika rift.



But this is not just a geologic question. Lake Tanganyika contains a menagerie of endemic species, occupying almost every imaginable niche along the highly variable habitats caused by the tectonic geometry. Understanding the evolutionary history of these endemic organisms requires a start date — when did the lake, and the canvas of habitats, form? Previous estimates fall into two camps: young (6–9 million years) and older (22–26 million years). These are big differences when trying to decipher evolutionary rates and processes for modern organisms.

A few days after our first sampling trip, we were bouncing along a dirt track in a Land Cruiser with Noel, a Tanzanian who works for The Nature Conservancy, in order to collect a second set of sand samples farther south along the lake-shore. We'd already been 10 hours on the road when we rounded a corner and almost ran into a large flatbed truck — laden with con-

struction materials — stuck in mud. It turned out the load consisted of building supplies purchased by the Nature Conservancy to build an addition to a girls school in Buhingu, Tanzania — our destination. The Nature Conservancy manages and supports several programs along the lake, including health and micro-financing, and also habitat conservation. The Nature Conservancy has a strong interest in understanding how modern land-use change impacts erosion and consequently nearshore habitats. The sand samples we were collecting not only were destined for thermochronology analysis, but also for cosmogenic nuclide analysis, which is done on ubiquitous quartz grains. Cosmogenic rays penetrate soil and rock to a certain depth. The build up of cosmogenic damage in quartz, therefore, provides a means of inferring how long the soil or rock was near the Earth's surface, in other words, it should provide a measure of erosion rates of the footwall uplifts,

and we can then try to tease out differences in erosion rates in the different fault segments along the lake. But the Nature Conservancy wants to know if erosion is accelerating along the lake over the last few decades, and to know this we will be able to provide a baseline of erosion rates over thousands of years to compare to short-term changes in erosion deduced by nearshore sediment accumulation studies that we have done in the past.

Next summer we will bring a bigger OU team, including undergrads, and collaborate with geology students and faculty at the University of Dar es Salaam as well as The Nature Conservancy to continue our work on constraining rift formation and rates of erosion, and mapping habitats along Lake Tanganyika. Hopefully, by next year we will have many answers to share as well.





# PROBING THE BASEMENT INTERFACE IN UNAWEEP CANYON

**LYNN SOREGHAN, PH.D.**

Research continues in Unaweep Canyon, the very odd landform that cuts across Colorado's Uncompahgre Plateau. This canyon is occupied today by two small creeks that flow in opposite directions from a divide within the canyon — posing two issues: 1 — there are two mouths to this canyon — strange, given that water cannot flow uphill; and 2 — these creeks are 'underfit' — too small to have carved such a large landform. Previous drilling in the canyon demonstrates a partial answer: this is a paleovalley, formerly occupied by the ancestral Gunnison River, which abandoned the canyon owing to a large landslide blockage, resulting in formation of a lake. So the valley is filled partially with Pleistocene sediment of both lake and alluvial fan origin. Study of the lake sediments, reported in the last *Earth Scientist*, is ongoing, with the goal to reconstruct a paleoclimate and paleofire history. We are also conducting work now on the sediment-basement interface, to determine the nature of the contact, which exhibits extreme fracturing of unknown origin. For this, we traveled to the U.S. Continental Scientific Drilling Facility at the University of Minnesota (in JANUARY, no less) to log and sample the core material. Our ultimate goal is to shed light on the formation of Unaweep Canyon, to resolve whether the ancestral Gunnison River carved this remarkable feature, or merely exhumed a much older (late Paleozoic) paleovalley.



# ENGEL RESEARCH UPDATE

MICHAEL H. ENGEL, PH.D.



I continue my collaborations with paleontologists. I have been working with Steve Westrop (emeritus professor at OU) to assess the timing of global extinction events, in addition to his ongoing collaboration with Joseph Frederickson and colleagues on the development of geochemical approaches for determining migration trends of Pleistocene age herbivores at Rancho la Brea.

Westrop, S. R., Engel, M. H. (2023). A record of the Steptoean positive carbon isotope excursion (SPICE; Cambrian, Paibian) from the Cow Head group, western Newfoundland. *Canadian Journal of Earth Sciences*, 60, 1–11. [10.1139/cjes-2023-0097](https://doi.org/10.1139/cjes-2023-0097).

Westrop, S. R., Welch, K. F., Engel, M. H., Adrain, J. M. (2023). Faunal and Paleoenvironmental changes at a Cambrian (Jiangshanian; Steptoean–Sunwaptan boundary interval) trilobite extinction event, in contrasting deep and shallow subtidal settings, Nevada and Oklahoma. *Journal of Paleontology*, 1–28. [10.1017/jpa.2023.75](https://doi.org/10.1017/jpa.2023.75).

I have also been working with an international group of petroleum geochemists and archaeologists to determine the origins of and ancient trade routes for asphalt (degraded crude oil) and bitumens in the middle east. The asphalt was commonly used to seal vessels, waterproof boats and in some funerary practices.

Connan, J., Adelsberger, K., Engel, M.H. and Zumberge, A. (2022) Bitumens from Tell Yarmuth (Israel) from 2800 BCE to 1100 BCE: an outstanding case history to study degradation effects on the Dead Sea bitumen. *Organic Geochemistry*, 168, 104392, (<https://doi.org/10.1016/j.orggeochem.2022.104392>).

Connan, J., Nilhamn, B., Engel, M. H., Zumberge, A., Akkermans, P.M.M.G, Abdula, R.A. (2023). *Chemical study of bitumens from Tell Sabi Abyad (Syria) from 7000 BCE to 1150 BCE, In: Style and Society in the Prehistory of West Asia* (pp. 63–91). Leiden.

Connan, J., Ghidoni, A., Mezzatesta, E., Joliot, C., Mathe, C., Vosmer, T., Gley, R., Bihannic, P. A., Engel, M. H., Zumberge, A. (2023). Geochemical study of the luting and coating of Medieval watercraft from the ship timbers discovered in the citadel of al-Balid, Oman: composition and origin. *Journal of Archaeological Science*, 49(104051), 1–26.

Connan, J., Elezi, G., Engel, M.H. and Zumberge, A. (2024) Natural asphalt on Late Neolithic (5000–4500 BCE) potsherds from southeastern Albania: a geochemical study. *Journal of Archaeological Science: Reports* 53, 104343, [doi.org/10.1016/j.asrep.2023.104343](https://doi.org/10.1016/j.asrep.2023.104343).

# CLIMATE, LITHOSPHERE AND SEDIMENTARY TECTONICS (CLAST) RESEARCH UPDATE

SARAH GEORGE, PH.D.

Our research group is interested in using sedimentary records to reconstruct tectonic and climatic processes. Three new M.S. students joined the CLAST research group in fall 2023, and all of them conducted field work during summer 2023. M.S. student Cassie Kenyon is working on drainage reorganization in the northern Andes. We spent two weeks in Colombia with collaborators measuring section in the Magdalena Valley and collecting samples for her research. Since then, she has separated samples for provenance analysis, and visited University of Arizona to conduct analyses. Brigid Bernier, A. Boyd, Gilby Jepson, Ph.D., and I conducted a field season in Alberta, Canada. Boyd's project (co-advised by Jepson) focuses on the timing of exhumation within the Rocky Mountain fold-thrust belt, and Brigid's project uses the sedimentary record of the Alberta foreland basin to explore erosion related to pulses of mountain building. All three M.S. students, along with CLAST undergraduate Will McCraine, presented preliminary results at Geological Society of America's Annual Meeting in Pittsburgh.

Four undergraduates have been helping out with various aspects of the CLAST lab. Will McCraine did a fantastic job on his undergraduate thesis on the provenance of the Ogallala Formation — and its implications for late Cenozoic topographic reorganization in the Rocky Mountains. He's off to University of Arizona to do a M.S., after completing an internship with the USGS in Denver. Alexis Griner used a set of paleosols from Colombia to reconstruct key climate variables in the Andean realm during the Cenozoic. Braeden Moreland has been working on periods of cryptic extension in contractional orogenic systems using magmatic geochemistry. Ally Stitt is just getting started in the CLAST lab but has been helping us prepare pedogenic carbonate nodules for isotopic analysis.

It has been a fun year for field trips. Jepson and I took the Orogenic Systems class on a six-day fold-thrust belt to foreland basin transect in Montana-Wyoming. I am writing this update from OU's Bartell Field Station, where I will try to keep up with Shannon Dulin, Ph.D., for a few weeks of field camp before co-leading an eight-day regional trip with Jepson to the Book Cliffs, San Rafael Swell, Arches and Canyon Range in Utah. We ran this trip last year for the first time as a five-day trip and are looking forward to a few extra days to appreciate the spectacular geology.

Next fall, we look forward to having Natalie Tanski, Ph.D., join as a postdoctoral researcher and Maria Reinoso join as a Ph.D. student. Both Natalie and Maria will join Cassie and I in Colombia this summer.





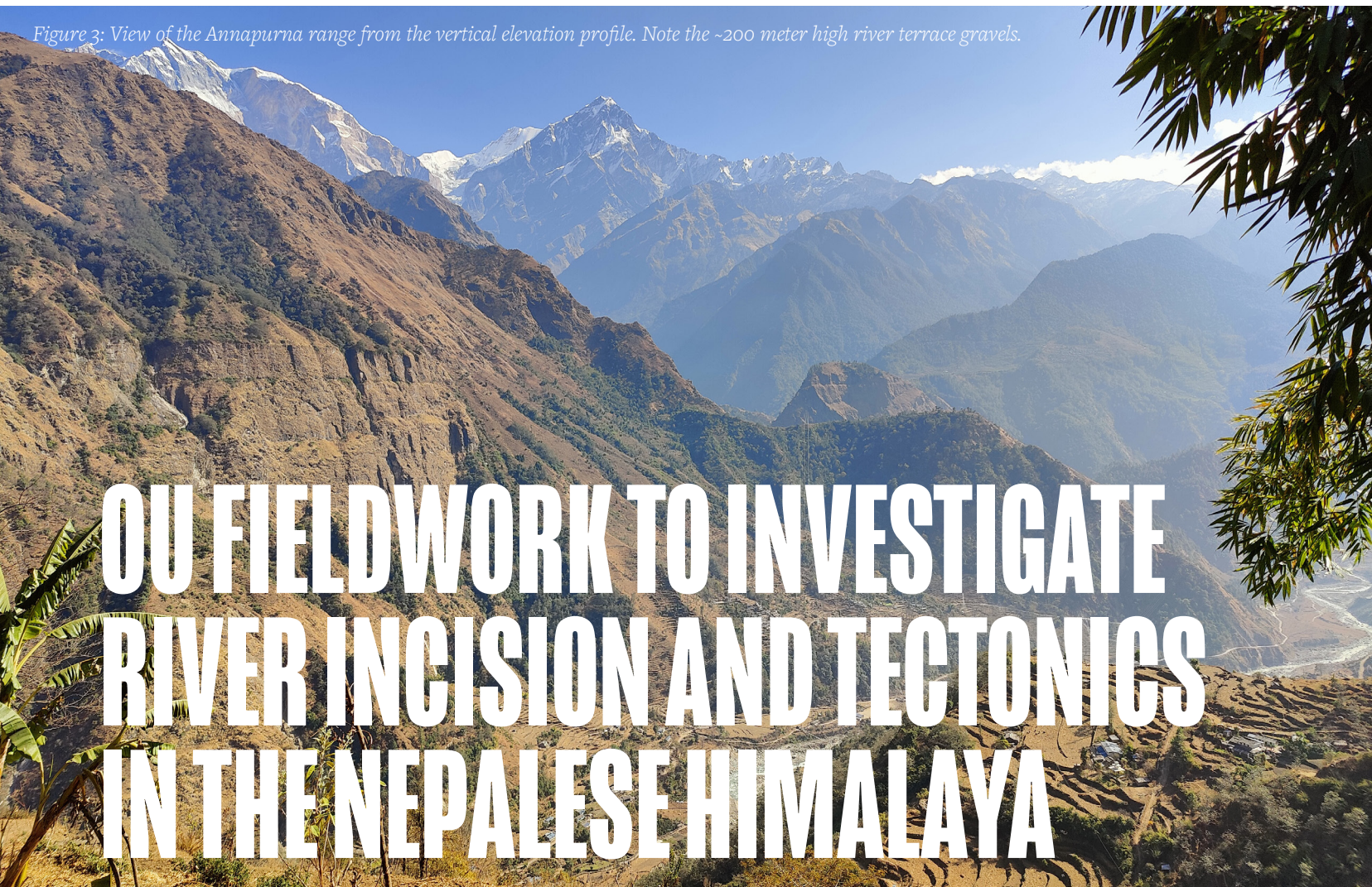


Figure 1: The OU team (Netra, Sarah, and Sofia) preparing to leaving Kathmandu.



Figure 2: Sofia, Sarah, and Deepak (Nepalese Geological Survey collaborator) collecting a modern river sand.

Figure 3: View of the Annapurna range from the vertical elevation profile. Note the ~200 meter high river terrace gravels.



## GILBY JEPSON, PH.D.

In early January, OU faculty Gilby Jepson and Sarah George, alongside Oklahoma Geological Survey researcher Netra Regmi and OU master's student Sofia Barth, travelled to the western Nepalese Himalaya, Nepal. This field trip was a part of Sofia's master's thesis, with the goal of dating timing and rates of river incision using a new method being developed at OU, monazite fission-track

thermochronology. After arriving in Kathmandu, the team drove west to Pokhara sampling the modern rivers which drain off the Himalaya.

At Pokhara (a major city in western Nepal), the OU team followed the Kali Gandaki northward towards Jomsom. The researchers were targeting the units of the Lesser Himalaya sequence, the Greater Himalaya sequence and the Tethyan Himalayan, which are

separated by the Main Frontal Thrust and the South Tibetan Detachment. Here, the team collected three vertical elevation profiles – a sample transect with ~200 m of elevation difference between samples with limited horizontal separation.

After two weeks of sampling along the Kali Gandaki and across to Barpak, the team returned to Kathmandu for the second leg of the field work journey. However, this was the hairiest moment of

the trip, as the road to Kathmandu was narrow and mountainous with numerous breakdowns. The team made it successfully back to Kathmandu and spent the next two weeks in the foreland basin measuring section for Dr. Sarah George's research project. We hope that this field work in Nepal kick-starts an active OU research program, investigating the relationship between atmospheric, tectonics and surface processes in the Nepalese Himalaya.



*Figure 4: OU master's student Sofia asking locals for directions.*



*Figure 5 (above): The OU research team along the south Tibetan detachment fault. This fault separates the high-relief Himalaya from the lower relief start of Tibetan plateau.*

*Figure 6 (top right): An image of garnets in a leucocratic vein from the Greater Himalaya sequence.*

*Figure 7 (bottom right): The narrow pass on the return to Kathmandu, which was blocked by broken-down cars.*





# COLE RESEARCH GROUP UPDATE

**LENA COLE, PH.D.**

Research in my lab group focuses on extinction and ecology in deep time, with an emphasis on the fossil record of crinoids and other echinoderms, the use of phylogenetic comparative methods, and integration of data from museum collections. In the last year, the Cole Lab was joined by a new graduate student, Alysha Zazubec, and an undergraduate researcher, Joey Gibbons. Colby Higdon and Caleb Simmons continued as undergraduate researchers, and we look forward to welcoming a new M.S. student, Nicolas Bell, to the group in the

fall 2024. Over in the Sam Noble Museum, where I am jointly appointed as assistant curator, we also welcomed Lyndsey Farrar as our new collections manager of invertebrate paleontology. Since arriving, Lyndsey has tackled numerous collections projects, revitalized our volunteer program and contributed to student mentoring in the weekly Paleobiology Research Group meetings that are held jointly between the Cole and Wright labs.

Recent notable work in the Cole Lab includes a paper published

in the journal *Geology* with collaborator Davey Wright, Ph.D., that evaluates whether seawater chemistry affected Phanerozoic diversity dynamics of echinoderms. This work integrated experimental data on rates of brittle star growth with geochemical proxies to evaluate how fluctuating seawater  $Mg^{2+}$  and  $Ca^{2+}$  ratios affected the diversity dynamics of echinoderms across the Phanerozoic.

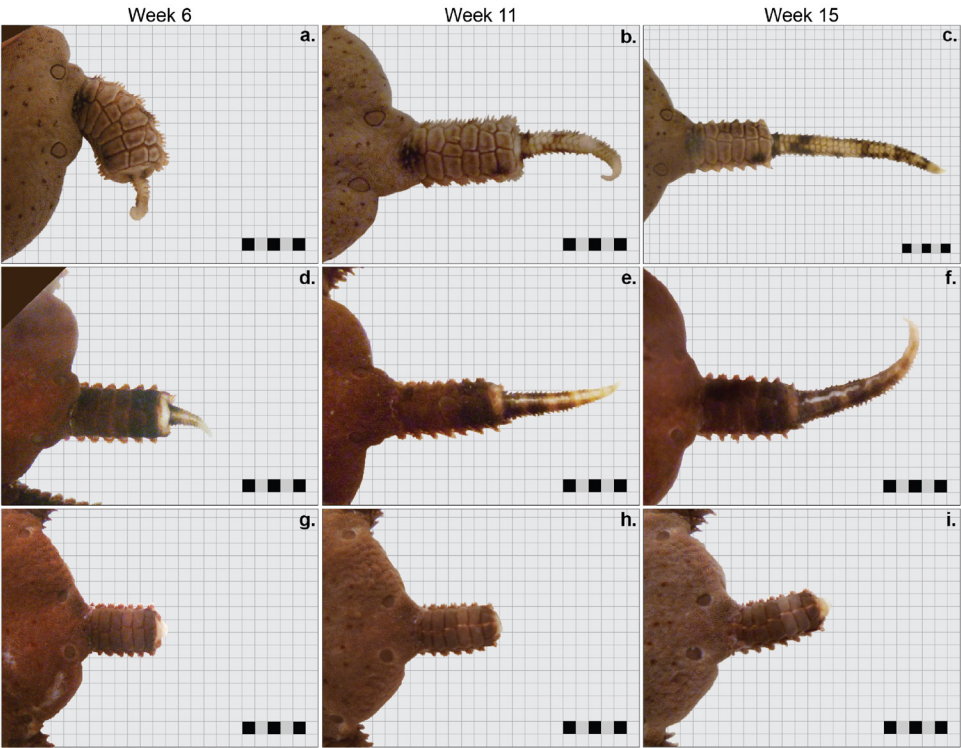
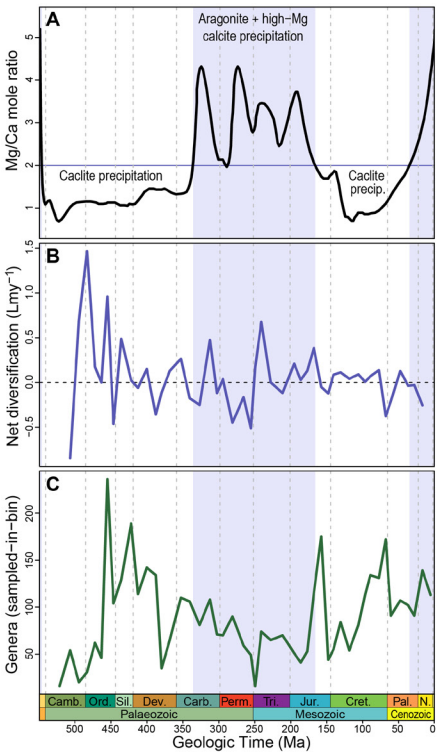
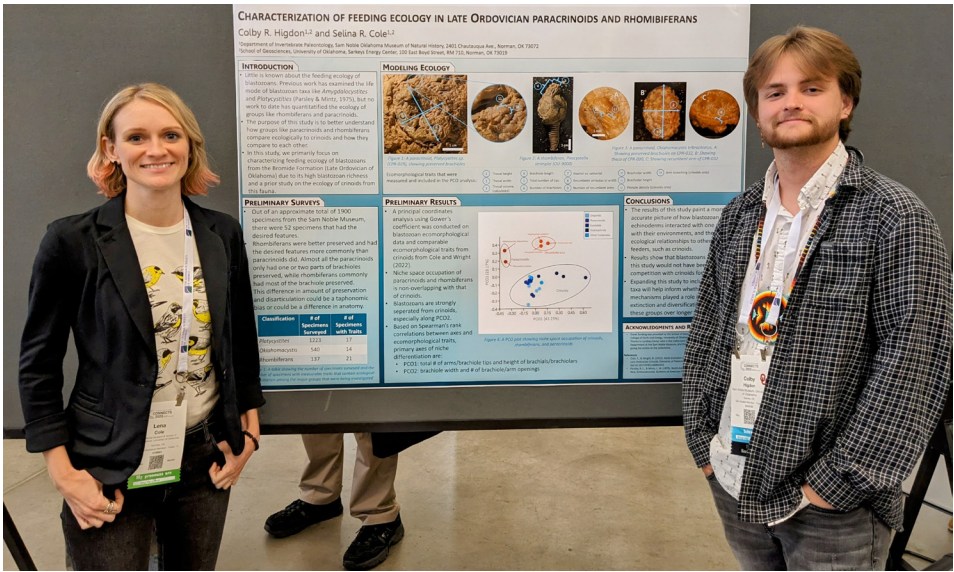
Other major research within the group includes ongoing collaborative fieldwork on Anticosti Island, Quebec, to study the Late Ordovician mass extinction. We ran a successful field season in August 2023, which produced a collection of >100 fossil crinoids that will help elucidate the timing and environmental drivers of this extinction event. An additional field season is planned for August 2024 to continue this research. In the spring, student Alysha Zazubec and I also made a joint research trip with the Wright Lab to study fossils at the Smithsonian National Museum of Natural History, which houses the largest collection of fossil crinoids in the world.

Students in the lab group have had many accomplishments in the last year. Alysha Zazubec was awarded a scholarship through the Oklahoma Geological Foundation, as well as a competitive Paleontology in the Parks Artist fellowship through the Paleontological Society and National Park Service. Her work in this program involves revising the NPS "Cenozoic Life in the National Parks" coloring book, which highlights some of the many fossils found in our National Parks to teach visitors of all ages about geology, paleontology and

deep time. Alysha also presented a poster on her undergraduate research at the annual Geological Society of America conference and is preparing a manuscript for publication based on this work.

Using specimens housed in the Sam Noble Museum's Invertebrate Paleontology collections, undergraduates Caleb and Joey investigated patterns of body size evolution across the Ordovician mass extinction throughout the academic year, while Colby completed a senior thesis on the feeding ecology of enigmatic echinoderms from the

Bromide Formation of south-central Oklahoma. Both Colby and Caleb presented posters on their research at the annual GSA Meeting as well as at OU research forums, where Caleb received awards for his poster at the AAPG Spring Student Expo and the Geosciences Symposium. Colby was also awarded a highly competitive student research grant from the Paleontological Society to complete his senior thesis and is now preparing a manuscript for publication of his research.



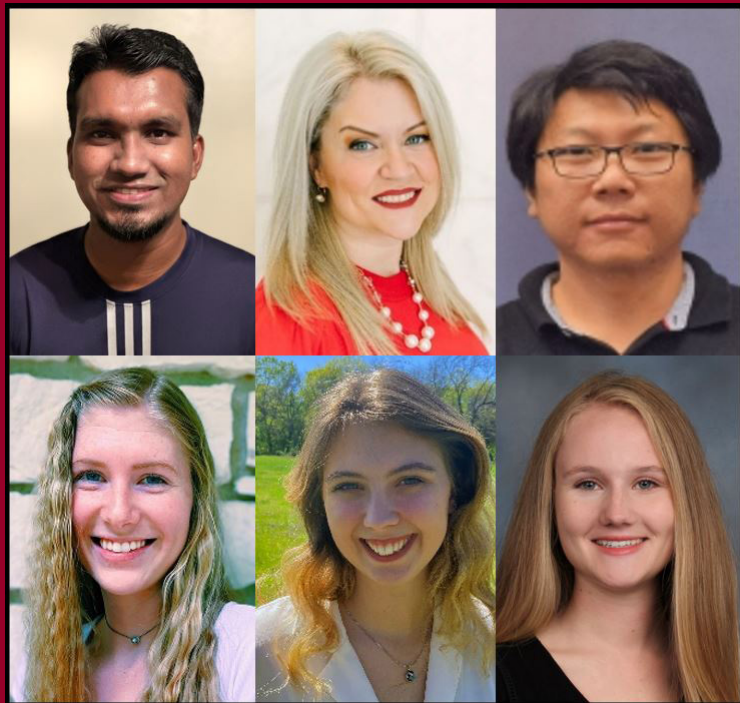
# RCML GROUP UPDATE

## MATTHEW PRANTER, PH.D.

The year flew by and was a very rewarding year in terms of research, teaching, service and administration. I completed the second year of my three-year term on the American Association of Petroleum Geologists Executive Committee and as AAPG editor. I also completed my first year as the director of the School of Geosciences.

In regard to research, my students in the Reservoir Characterization and Modeling Laboratory have been very productive in their courses, research, teaching and presentations at several conferences. Anna Turnini (Ph.D. candidate) presented a poster on the state-wide assessment of CO<sub>2</sub> Storage Capacity for the Cambrian-Ordovician Arbuckle Group and selected Ordovician formations of Oklahoma at the 2023 IMAGE Conference (Houston), the AAPG Midcontinent Section Conference (OKC) and at the 2024 Carbon Capture, Utilization, and Storage Conference (Houston). My former Ph.D. student, Abidin Caf (now at Devon Energy), presented at the Midcontinent meeting on our research that addresses seismic-constrained reservoir modeling and simulation for CO<sub>2</sub> sequestration potential assessment of the Arbuckle Group. My Ph.D. candidate, Rui Zhai, also presented at IMAGE and the AAPG Midcontinent meeting on his research that addresses fine-grained turbidite deposits of the Leonardian Bone Spring Formation in the Delaware Basin.

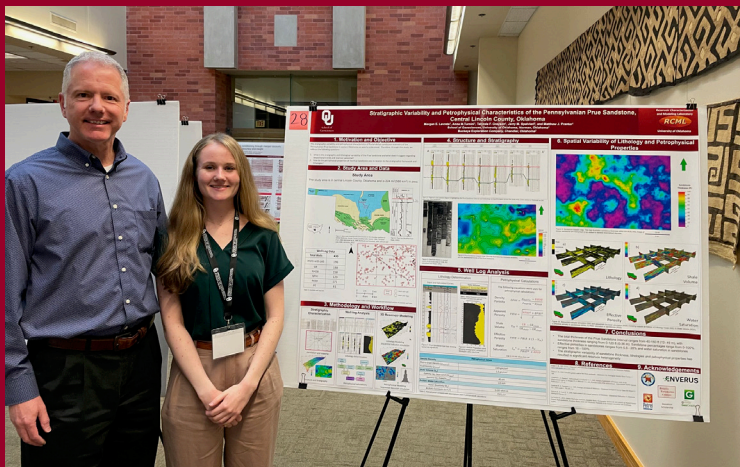
Several of my students presented posters at the 2024 AAPG Spring Student Expo at the National Weather Center and at the Student Research Symposium in Sarkeys Energy Center. They did an outstanding job discussing the controls that structure, stratigraphy and sedimentology play in regard to reservoir architecture, lithological and petrophysical-property heterogeneity and storage-capacity estimates.



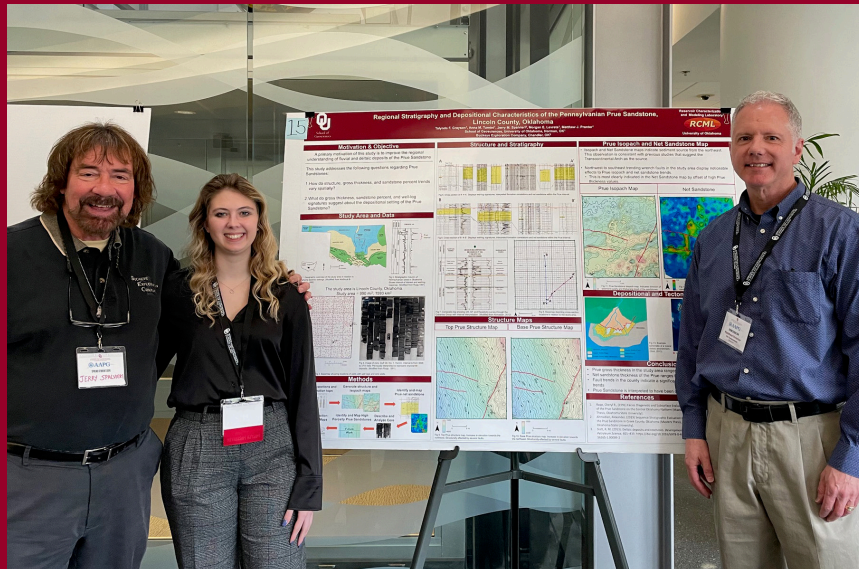
RCML Graduate Students: Ph.D. students (upper row, left to right): Montasir Akif, Anna Turnini, Rui Zhai. M.S. students (lower row, left to right): Grace Barber, Faith Grayson, Morgan Levrets



Poster presenters Montasir Akif, Grace Barber, Faith Grayson, Matt Pranter, Morgan Levrets and David Fleenor (undergraduate student) at the Student Research Symposium



Matt Pranter and Morgan Levrets at her research symposium poster.



*Jerry Spalvieri (Buckeye Exploration), Faith Grayson and Matt Pranter at the AAPG Student Expo*



*Matt Pranter with Faith Grayson and Morgan Levrets. Faith and Morgan received awards from the Oklahoma Geological Foundation.*

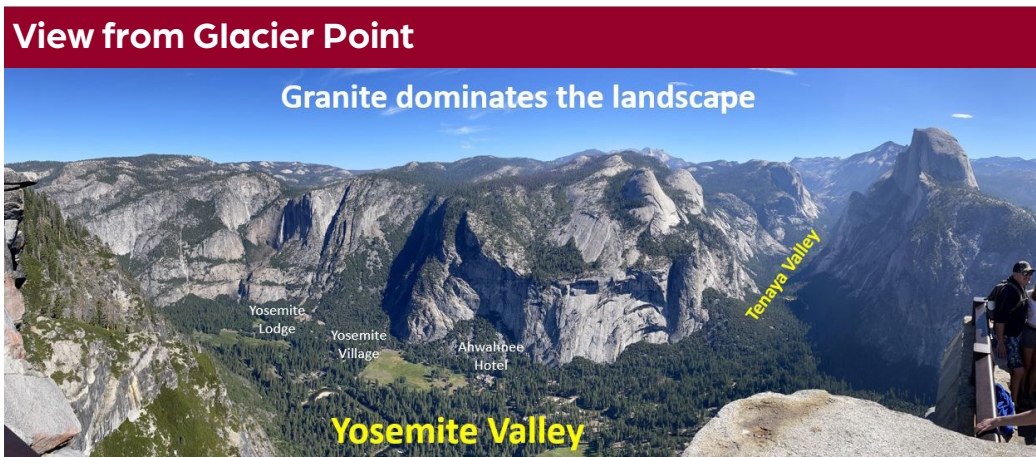
In regard to teaching, students in my Subsurface Methods (GEOL 4233) course enjoyed the fall 2023 field trip to the Piceance Basin near Grand Junction, Colorado. We visited several localities to analyze world-class fluvial and shallow-marine outcrops. Later in the semester, the students analyzed subsurface data from the Piceance for these same formations. Javier Tellez, Ph.D., Rex Cole, Ph.D., and I co-lead the trip. Tellez and Cole are both professors at Colorado Mesa University in Grand Junction.



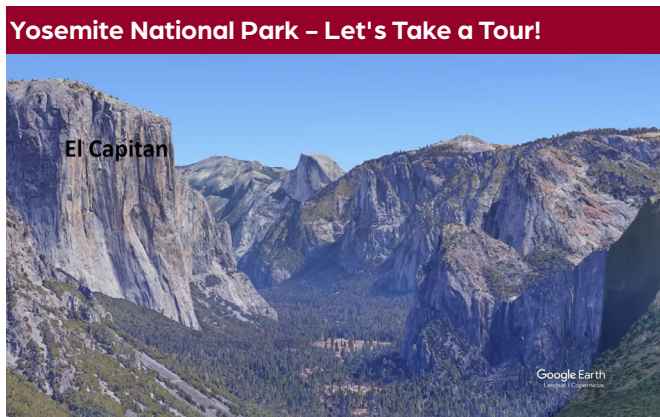
*Localities with outstanding exposures of Cretaceous fluvial and marginal-marine deposits are visited during the Subsurface Methods field trip to the Piceance Basin in northwestern Colorado. Students from Geosciences, Petroleum Engineering and Energy Management participated.*



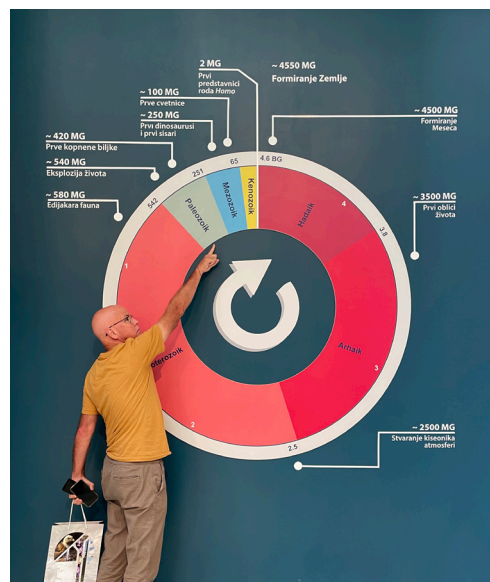
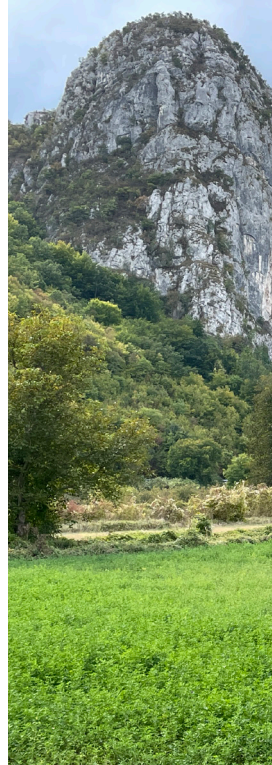
I was excited to offer a new general education course in fall 2023 called Geology of National Parks (GEOL 1023). I subdivided the course based on geological processes. I cover a range of parks from Yellowstone, Hawaii Volcanoes, Mount Rainier and Lassen Volcanic to Grand Canyon, Zion, Bryce Canyon, Canyonlands and Arches, to Yosemite and Carlsbad Caverns. I spent a significant amount of time this past year teaching myself how to create visually stimulating geology video tours or "flythroughs" for teaching. I am using a combination of several software packages including, Google Earth, Google Earth Studio, Adobe Media Encoder and Adobe Photoshop (final video editing and annotation) to create the geology video tours. The students really liked the geology video tours as they provided excellent virtual experiences. Based on student feedback, I will create several in-class Google Earth-based activities to further enhance the teaching and learning experiences



*Panoramic image from Yosemite National Park (from my recent visit!) showing the glacially formed valleys and granite-dominated landscape.*



*Screen capture from the Google Earth video flythrough for Yosemite National Park showing the Merced River Valley and prominent features of El Capitan, Half Dome and Bridalveil Falls.*





# SOREGHAN SABBATICAL

**LYNN SOREGHAN, PH.D.**

Mike Soreghan and I spent the fall 2024 sabbatical semester in Serbia — one of the (former Yugoslavian) countries of the Balkans (southeastern Europe). I was on a Fulbright Fellowship to study some of the near- and deep-time dust deposits of the region. Serbia hosts some of Europe's most complete records of Pleistocene loess deposits, and European scientists have constructed detailed records of paleoclimate by studying metrics such as particle size, geochemistry, provenance and isotopes (of snail shells), for example. Some of the thickest deposits occur along the edges of the legendary rivers of the region, including the Danube — which appears more brown than blue on account of all the silt it carries from the loess cliffs. During the semester, we visited field sites of Pleistocene loess in both Serbia and Hungary, and of archeological sites formed in loess, presented research talks in Serbia and Hungary, and conducted preliminary work on Permian strata that of course have us thinking about dust. We also visited spectacular sites for geology and geoheritage in surrounding countries such as Croatia, Montenegro, Slovenia and Kosovo. We hope to return in future field seasons to introduce U.S. students to the natural and geological beauties of the Balkans.



# MEMORIALS

## IN MEMORY OF OUR ALUMNI GONE TOO SOON

James Lindy Atkinson  
William L. Basham  
Jane A Baucum  
Douglas Bellis  
David Cleveland Blakeley  
G. W. Brock  
Donato Cipriani  
William R. Cronoble  
Burt Lewis Culp  
John Kasimir Dubiel  
Carol Ann Egger  
C. J. Gossett  
Charles L. Howell  
Jim L. Hurley  
Donald R. Jay  
Pete J. Klentos  
C. M. Krivanek  
Bill Marvin Lincicome  
Jack Hastings Mayfield  
Kenneth E. McCulloch

Charles N. McDonald  
Carl D. Musgrove  
Gerald D. Neff  
Brian Edward O'Brien  
David M. Patrick  
Jack Everett Plitt  
Earl L. Putnam  
Kenneth Renfro Reagan  
Lynwood Eddy Reinhardt  
Jacob B. Rivers  
J. Craig Robinson  
Robert Bruce Sanders  
Leale Slate  
Richard Allan Slater  
Robert Smith  
Robert Brooke Stagg  
Kneelon Edward Teague  
J. Paul Tidwell  
Collin Cain Walker  
Philip C. Withrow

*\*as reported to OU Advancement through July 2024*

# REMEMBERING DOUG BELLIS

ANDREW CULLEN, PH.D.

Douglas "Doug" Keith Bellis passed peacefully on April 20, 2024, in the presence of family and friends. Born in Germany in 1955 and raised on east Norman's rolling red sandstone hills, Doug was a global citizen with easygoing charm, boundless curiosity and a high tolerance for work. Doug went through the Norman school system and graduated in 1973 from Norman High School, where he played trombone and several varsity sports, excelling at swimming the backstroke. Doug lettered on the OU swim team as a freshman and swam throughout his life. If there was water, he was backstroking, even in Lake Thunderbird.

Earning his Baccalaureate in geology from the University of Oklahoma in 1978, Doug moved to Colorado, working as a minerals geologist, including drilling uranium orebodies on the Western Slope. He could ski the black runs at Telluride but was a horrible ice skater. After 3 Mile Island Doug transitioned to oil and gas, spending the rest of his career at midsize companies, even having a good run as a "self-unemployed" independent. Doug kept honing his skills and helped lead Chesapeake Energy's global unconventional team evaluating shale plays of the world. He finished his career as senior VP of geology for Warwick Investments. Doug was an active member of the OU geology's Advisory Council and served on the Board of the Oklahoma Geological Society. Throughout his professional ascent, Doug generously shared his time coaching junior staff, practiced patience with management, and advanced more by merit than personal ambition.

Doug's eidetic memory and geo-mania let him regale all, especially his family on road trips, with detailed tangential stories of formations and geological history – usually with at least one hand on the wheel. Like many Sooner-Born-and-Sooner-Bred, Doug followed OU sports, especially the football team. He could recall specific plays and final scores from the Switzer glory days, as well as the misery of the Gomer Jones years. Saturdays at Owen Field was his version of the Hajj.

Doug was time-challenged and embraced spontaneity, exemplified by the day his life would be forever entwined with Tina Erickson, who was



working as an aerospace beverage server on an Air Micronesia flight from Papua New Guinea to Guam. That story is too long for this writing, but love at first sight culminated in marriage six months later, and a marriage that produced two wonderful daughters, Jenna Andrea and Carmen Camille, who now reside out of state working in nursing and city planning, respectively.

Tina and Doug settled into an eclectic community of friends in east Norman and their over-sized pool, big enough for Doug to swim laps, was the nucleus for many impromptu parties that extended beyond midnight. Doug preferred metaphysics to religion. When his knowledge of history, politics and religion met with his love of debate, there was rarely a conversational hiatus in any gathering. When they weren't chilling by the pool, Doug and Tina regularly caught Grateful Dead shows at Red Rocks and spent summer months on a tranquil expanse of lake front in Minnesota, where the Bellis clan and Erickson tribe became one Scots-Norwegian family.

In addition to Tina, Jenna and Carmen, Doug is survived by his mother, Betty Bellis-Mankin, and his younger sister, Karen Powers, nee Bellis. Doug was preceded in death by his dad, Bill Bellis. Doug and Tina developed close friendships with Bill's second family in Wyoming, Janet, stepmother and stepsiblings Irene, Lewis and Galen. Doug had a warm extended family circle of cousins, uncles and aunts, particularly Uncle Ben, and cousins Lynn and Toby.

Plans for memorial services have yet to be scheduled but will be announced when details are firm.

Throughout his decline Doug never wavered in his enthusiasm for life. Let us live up to this in our own lives. So, to W.H. Auden shall we say:

Do not stop the clocks, silence the piano nor muffle the drum.

Energy and mass are forever one.

Let crashing waves reclaim the shores.

As mountains rise evermore.

Let the evening stars burn bright.

Beyond the glowing moon's reflected light.

Through our tears we cheer and laugh.

Celebrating a man who never did things by half.

# SUPPORT



# GEOSCIENCES



## FIELD TRIPS

**We are especially in need of funding to support our annual field trips.** Many courses incorporate field trips that allow our students to get hands-on experience. Recent and upcoming field trip destinations include: Texas Gulf Coast, Piceance Basin, Colorado, Florida Keys, Guadalupe Mountains, Book Cliffs and eastern Utah, and Montana. We also lead a First-Year Field Trip and New Graduate Student Field Trip each year.

## PIGOTT COLLOQUIUM SERIES

John D. Pigott ("Dr. P") was a professor of geology and geophysics at the University of Oklahoma for more than 41 years (1981–2023). He was a strong advocate of the School of Geosciences and, importantly, was a champion of the weekly Colloquium Series; therefore, this endowed fund to support the Colloquium is named in his honor.

visit **geosciences.ou.edu** to  
learn about upcoming events  
and ways to get involved.



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