

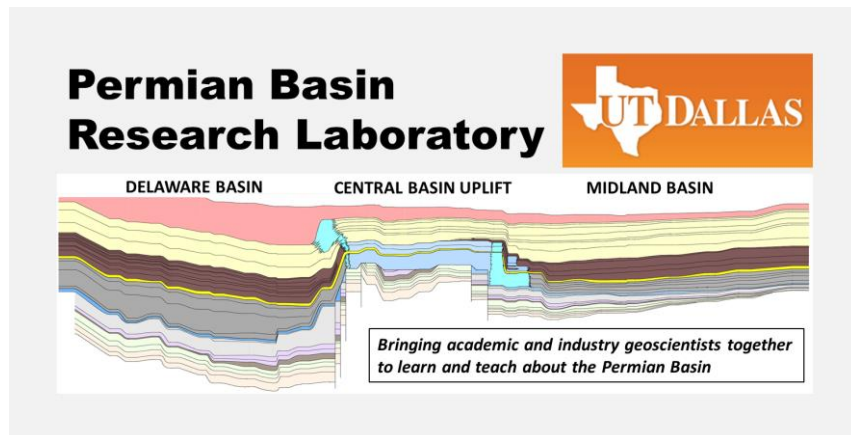
# Newsletter

## Spring 2023

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# UT Dallas Permian Basin Research Lab



Co-Directors: Mr. Lowell Waite, Lecturer

Dr. Robert Stern, Professor

Established 2019

Website: <https://labs.utdallas.edu/permianbasinresearch/>  
Join Facebook Group "Permian Basin Research Laboratory"

## Permian Basin Research Lab:

## Welcome

# The UTD PBRL Newsletter, Spring, 2023

Welcome to our official newsletter for Spring, 2023!

The Permian Basin Research Lab was officially established in January, 2019, within the Department of Geosciences at the University of Texas at Dallas. We are very proud of what we've accomplished in 4 short years!

In this newsletter you'll learn about what we've been up to since last year's newsletter. In the following pages, you can find out who we are (p. 3), read about our recently completed and continuing research efforts (p. 4-5), learn about our teaching and training activities beyond the formal courses we teach at UTD (p. 6), read brief descriptions of the five Masters students who graduated since our last newsletter and where they are working now, and the two new students who have joined PBRL (p. 7), enjoy some exciting news (p. 8), and learn about UTD Comets Giving Day on April 19-20, 2023 (p. 9), when our many friends and supporters can help us full fulfill our mission and goals:

- Advance understanding of all geologic aspects of the Permian Basin through open applied research, linking academia and industry
- Educate students interested in industry careers by providing experience with subsurface data sets in the analysis of sedimentary basins and petroleum systems

In 2022 and into 2023, we continue to expand our network of students and industry partners. We rely heavily on our industry supporters to provide ideas and data for student projects, hire and provide internships for our students, and who support us financially. All financial support goes to support our students!

Sincerely,  
Bob and Lowell



## Permian Basin Research Lab:

## People

### Directors

**Dr. Robert J. Stern** Professor of Geosciences, UT Dallas  
**Mr. Lowell Waite** Lecturer, UT Dallas

### Researchers

**Dr. Mortaza Pirouz** Senior Lecturer, UT Dallas  
**Dr. Hejun Zhu** Assistant Professor, UT Dallas

### Affiliated Faculty

**Dr. Majie Fan** Associate Professor, UT Arlington

### Industry Associates

**Dr. Yuxiang (Shawn) Zhang** B. I. Analyst, Range Resources  
**Mr. David Williamson** Founder, Wheelhouse Geoscience  
**Mr. Tim Reed** Pioneer Natural Resources (Retired)

Note: Full bios are available on the Permian Basin Lab website:  
<https://labs.utdallas.edu/permianbasinresearch/>



## RECENT RESEARCH RESULTS

As reported last year, the UTD PBRL has been involved with some cutting-edge research involving the study of a number of thin volcanic ash beds found in subsurface cores from the Midland Basin. This research was spearheaded by Dr. Hepeng Tian as part of his Ph.D. project at the University of Texas at Arlington. Dr. Tian completed his degree in December, 2022 and his research results have now been published in two prestigious peer-reviewed journals, *Geology*, and *Gondwana Research*.

The first paper, published in 2021 in volume 50 of *Geology*, is entitled “Mississippian southern Laurentia tuffs came from a northern Gondwana arc.” In this study, Hepeng analyzed a number of zircon grains recovered from ash beds within the Mississippian Barnett Shale buried deeply in the central portion of the Midland Basin. Uranium-lead ages of the zircons, together with isotopic and geochemical analysis indicate the volcanic tuffs were derived from a continental arc within northern Gondwana that was active between 328 and 317 million years ago. These data help document the closure of the Rheic ocean along the southwestern margin of ancient North America via the southward subduction of the Rheic oceanic plate beneath Gondwana. The age dates of the tuffs permit correlation of the Midland Basin samples more than 800 km to volcanic sediment in the Ouachita Mountains of SE Oklahoma and SW Arkansas, along with coeval magmatic activity on the Maya block of southern Mexico.

The second paper, published in 2022 in volume 111 of *Gondwana Research*, is entitled “Rapid early Permian tectonic reorganization of Laurentia’s plate margins: Evidence from volcanic tuffs in the Permian Basin, USA.” In this study, analysis of zircon grains recovered from ash beds within lower Permian Wolfcamp and Spraberry deposits from the Midland Basin provide the first set of absolute ages of Cisuralian (early Permian) ages within the basin. Zircon geochemistry data show the parent melts of these tuffs were granitic melts formed in two separate continental arcs. Tuffs within the Wolfcamp B shale show affinity to a Rheic Oceanic plate with northern Gondwana source, while those within the Wolfcamp A and Spraberry shales suggest a source related to a paleo-Pacific oceanic plate. These findings document the rapid reorganization of tectonic plates along the southwestern margin of North America during early Permian time.

We congratulate Hepeng as leading researcher and author on two outstanding studies. Hepeng recently accepted a position as a data analyst within the Financial Technical Group of Amazon.

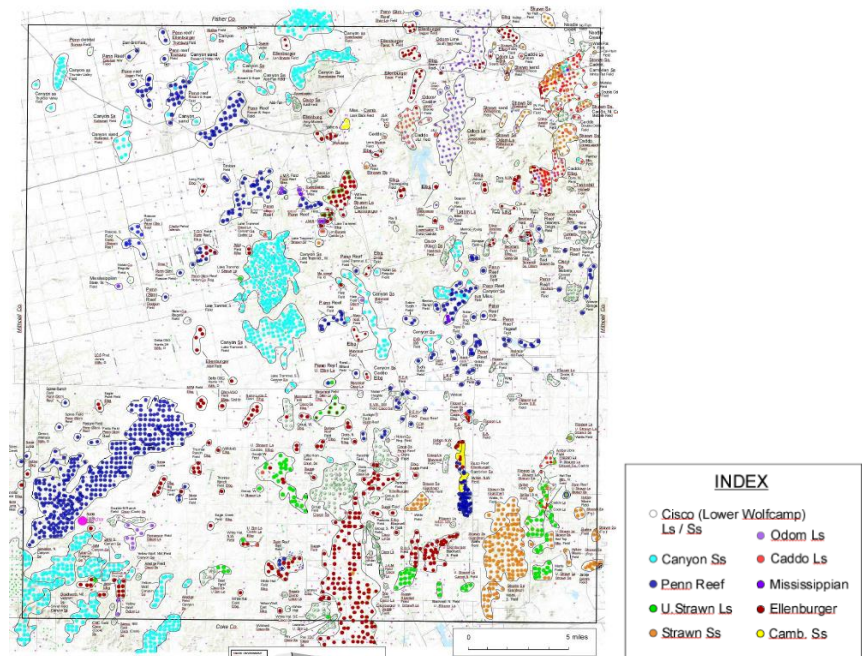
## Permian Basin Research Lab:

## Research (continued)

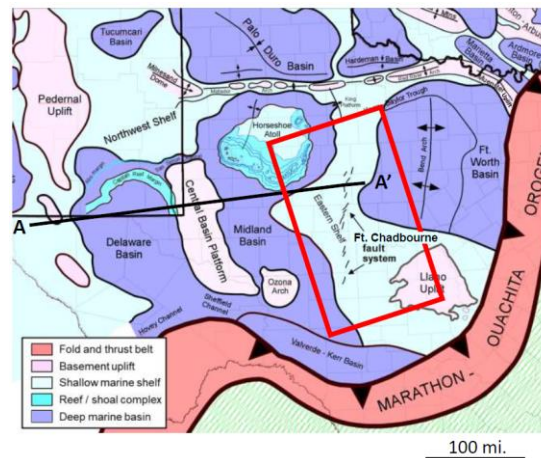
**Eastern Shelf of the Midland Basin:** Other recent research within the Lab continues to focus on the depositional systems and hydrocarbon reservoirs of the Eastern Shelf. We have completed a preliminary analysis of producing trends in Nolan Co., TX and presented our results to date at the 2020 Dallas Energy Forum sponsored by SIPES (Society of Independent Professional Earth Sciences).

We continue to work this stratigraphically-complex region, currently assessing Fisher Co., with plans to expand into eastern Scurry and Kent counties. In addition to providing potential M.S. projects for UTD students, we hope to ultimately better understand the future hydrocarbon potential of this mature geologic province.

### NOLAN COUNTY PRODUCING ZONES



(large, downloadable version of this map available on PBRL website)



**Permian Basin  
Research Lab:  
Teaching and Training**

## TEACHING AND TRAINING

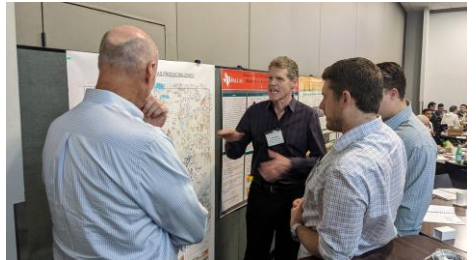
Teaching and training continue to be a focus of the Lab. We are always happy to engage with local energy companies to share knowledge and data. In 2022 we interfaced with several companies including Scout Energy Management, Silver Hill Energy Partners, Foundation Energy Management, Pioneer Natural Resources, and Ovintiv (formerly Encana). We are excited to have recently connected with Cholla Petroleum. We value all our interactions with industry!

In November, 2022, the PBRL, UTD, and SIPES hosted the Dallas Energy Forum attended by over 80 energy professionals and students. UTD presenters included Lowell Waite and Shawn Zhang (recent research on the Eastern Shelf), PBRL student Alec Veasey (Austin Chalk study), Dr. Zach Sickmann (Tertiary sediments of the SW Gulf of Mexico) and Dr. David Lumley, Chairman, UTD Geosciences (Carbon capture and sequestration).

In January 2023, the PBRL and UTD hosted a two-day core workshop for the Dallas Geologic Society. Core and geologic information was provided by Denbury Resources; the workshop included 35 attendees.

In 2022 – 2023 we continued to accept invited speaking opportunities whenever possible. Presentations include:

- Abilene Geologic Society (Waite, Horseshoe Atoll; May 19, 2022)
- Dallas SIPES (Stern, Marianas Trench; March 21, 2023)
- North Texas Women's Energy Network (Waite, Permian Basin petroleum system; April 5, 2023)
- Fort Worth Geologic Society (Waite, Eastern Shelf; April 11, 2023)
- Permian Basin Section-SEPM (Waite, Eastern Shelf; May 16, 2023)



## Permian Basin Research Lab:

### Student Projects

## STUDENT PROJECTS

2022 was a banner year for the Lab for completing five M.S projects and successfully completing graduation for the following students:

- Robert Yao (Producing trend analysis, NW Nolan Co., TX); accepted a full-time position with Freeport-McMoRan mining
- Alex Gonzalez (Claytonville Canyon Reef Field, Fisher Co., TX); employed as a geologist for Scout Energy Partners
- Kevin Hiss (San Andres oil reservoir, Northwest Shelf); accepted a geotech position with Scout Energy Partners
- Alec Veasey (Austin Chalk facies, Webb Co., south Texas); accepted a full-time position with Freeport-McMoRan mining
- Aldwin Vazquez (L. Strawn Caddo carbonates, NE Nolan Co., TX); accepted a full-time position with Core Laboratories

We continue to welcome new students to the Lab. We are excited to add M.S. candidates Emily Strain and Jordan Groff to the PBRL Team this year.

## Permian Basin

### Research Lab:

## Recent News

### RECENT NEWS

- We wish to extend our gracious thanks to Mr. Beau Tinnin and EOG Resources for their generous monetary donations to the Lab. These funds will be applied directly to support student projects.
- We continue our fruitful partnership with Enverus and their University Liaison Program. Last year they provide software training for three of our M.S students in the Lab, and this year, they will begin training for five new student, including three undergraduate majors <https://www.enverus.com/>
- We have recently partnered with M.J. Logs to provide the Lab with high quality raster log images for minimal cost. Obtaining these well logs are critical to our research on the Eastern Shelf and Permian Basin <https://mjlogs.com/>
- Dr. Robert Stern recently completed his 40<sup>th</sup> year of teaching and research at UTD. This is an incredible milestone for him and UTD Geosciences!
- Just before press-time it was announced that Lowell Waite was bestowed the 2023 Distinguished Educator Award by the SW Section of the AAPG. The Distinguished Educator Award is given in recognition of distinguished and outstanding contributions to geological education with respect to petroleum geology in the Southwest Section area (Abilene, Dallas, El Paso, Ft. Worth, North Texas, Roswell, San Angelo, and West Texas Geologic Societies). This is a great honor for the Lab, as well as for UTD Geosciences and the UTD Department of Natural Sciences and Mathematics.





Comets Giving Day is an annual fund-raising event at UT Dallas. This is a chance for individuals to contribute to the future of UTD by directly supporting our students. We wish thank all those individuals who graciously donated funds to the UTD Geoscience Department, and to the Permian Basin Research Lab, during past Comet Giving Days

Comet's Giving Day this year will be held on April 19 - 20, 2023. Donations may be targeted to several funds within the UTD Department of Geosciences, including a Permian Basin Research Lab Fund. Even a small donation makes a difference for our students! We thank you for your consideration this year.

In addition to The PBRL, there are many Geoscience funds to choose from. Featured this year will be:

1. Sustainable Earth, Environment, and Natural Resources - these funds will be used to help our geoscience faculty, both new and experienced, to develop exciting new courses, research opportunities, and field methods for undergrad and grad students, to help address many of the earth science Grand Challenges facing our society today.
2. The Colton Roberts Memorial Scholarship – a recent UTD student who tragically lost his life when he was struck by a driver with multiple DWIs.
3. Geoscience Studios - these funds will help Dr Stern's project to make more student educational outreach videos explaining geologic concepts.
4. Geosciences General - these funds are to assist the Dept overall - most importantly to raise funds for our field camp programs and scholarships. This year we are buying three new 4x4 vehicles to replace our aging fleet, adding drones, toughbooks and tablets to modernize our fieldwork methods, and adding a Geophysics component to our field camp to increase student knowledge and job marketability. As part of this field camp renewal, our new faculty member Dr Zach Sickmann will be leading two new field camps in Big Bend and Palo Duro canyon this summer.

Information on Comets Giving Day, including how to donate, may be found here: <https://givigday.utdallas.edu/>  
 PBRL donation page: <https://givingday.utdallas.edu/giving-day/66639/department/75315>