TREASURES *from a year of* GEOSCIENCES

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COLLEGE OF SCIENCE
Geosciences

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Cover Photo
Tufa deposits at Mono Lake, CA, after a big storm.
Eytan Bos Orent, Graduate Student

From the Department Head

Greetings GEOS family and friends,

I was raised in this department, having earned my BS in 1996 and the nickname "Little George" while working alongside George Gehrels and many other former and current faculty in the lab and field. As such, it is an honor to serve the department in this role and to give back to the GEOS family that has so generously supported me for more than 30 years.

This past year has been marked by unprecedented changes and remarkable accomplishments.

We mourned the loss of our beloved Andy Cohen (see page 24). We are organizing a celebration of Andy's life to be held on Saturday, March 28, 2026, immediately following GeoDaze. Please consider strengthening Andy's legacy by donating to his Memorial Fund (see page 24).

George Gehrels suffered a cardiac event last fall, but his remarkable recovery continues as he returns to lasers, rocks, and boats. Hervé Rezeau was recruited by MIT to strengthen their program in Earth Resources. While we're proud of this recognition of his talents, we'll miss him greatly.

I am grateful to former Department Head Joellen Russell and our entire staff for skillfully navigating budget cuts and organizational changes. We have the best staff on campus, and their excellence has allowed them to expand their service to additional units while maintaining their central role in GEOS. Thanks also to Jessica Kapp for filling additional roles as Director of Undergraduate Studies and Senior Undergraduate Advisor.

Despite challenging circumstances, we have much to celebrate. Our faculty achieved record-breaking success in both the number and value of new grants funded. The Arizona LaserChron Center had an outstanding year (see page 12), setting records in analyses conducted and NSF grants supported. GEOS ranks #1 nationally for placing students into tenure-track faculty positions and is the only HSI institution in the top 10 (https://doi.org/10.1130/GES02661.1; Table 2).

Individual faculty achievements include George Davis receiving the Raymond M. Turner Award for his scientific service at Saguaro National Park, Mihai Ducea's election as an AGU Fellow, Mauricio Ibañez-Mejia earning this year's GEOS Outstanding Faculty Award, Ananya Mallik receiving a prestigious NSF CAREER grant, and National Academy of Sciences member Jay Quade receiving the University of Utah Outstanding Alumni Award. Congratulations also to Marcus Lofverstrom and Kaustubh Thirumalai for being promoted to Associate Professor with tenure!

Our students continue to excel in research, teaching, and service, contributing significantly to our high ranking (U of A ranks among world's best in physical sciences | Geosciences). We're particularly proud of our award-winning, student-led Southern Arizona chapter of AWG. Caden Howlett and Priscilla Martinez, along with many dedicated volunteers, flawlessly organized our 53rd annual GeoDaze (see page 5 for awards). The SESS club remains vibrant and continues its annual outreach event at TGMS. This spring, the College of Science recognized Katleho Ramotso as our outstanding graduating senior and Kay Poonawala for excellence in undergraduate research. We are thrilled that Katleho is continuing in our MS program.

Our first-of-its-kind BS program in Planetary Geoscience – offered jointly with Planetary Sciences/LPL – has already attracted 28 majors (with two obtaining degrees) in just two years. Lift off!

We always welcome visits and updates from our friends and alumni, and we're deeply grateful for your continued support. Let's rock this next year together!

Bear Down and best wishes,

Paul Kapp
Professor & Interim Department Head

Update from Associate Department Head Jonny Wu

Greetings! It is a privilege to introduce myself as the new Associate Department Head. I look forward to serving our talented and hardworking group of students, faculty, and staff. I also want to take this opportunity to show our appreciation to our outgoing ADH Jon Pelletier, who has served us since 2022.

A little about me — I'm an Associate Professor who enjoys unravelling the dynamic history of our planet – from plate tectonics and structural geology to basin evolution and geodynamics. My academic journey has taken me around the globe and even into Earth's deep interior. I explore lost tectonic plates deep in Earth's mantle, reconstruct North and South American Cordillera plate tectonic history, model mantle flows beneath North America and East Asia, and am working to apply AI and machine learning to search for mineral deposits.

This summer, I was honored to give a keynote talk at the GSA 2025 Penrose meeting on Eclogites, held in California. My talk was entitled "New insights on Sanbagawa-Ryoke paired metamorphic belt, Japan, and Franciscan complex, USA, from circum-Pacific plate reconstructions using tomographic slabs". Our recent PhD graduate Jordan Wang was a co-author. The meeting included 98 participants from 16 countries and had two days of field trips to the Franciscan complex north of San Francisco. I was grateful to learn about the newest developments in metamorphic petrology and subduction zones.

Over the summer, I am also working with Freeport McMoRan on an AIM (Academic-Industry Mining) fellowship, which is a Freeport work-and-learn program designed to engage faculty in priority disciplines at accredited universities. My project deals with structural geology and copper exploration. I've enjoyed the opportunity to meet Freeport geoscientists and learn about their scientific challenges and opportunities.

Over the coming months, I'll be spending time listening, asking questions, and helping to update our department short-term and long-term strategic plan. I'm always happy to have a conversation, so feel free to reach out and say hello!◆

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▼ We honor the memory of Professor Andrew "Andy" Cohen who passed away earlier this year. Here he is with Professor Jay Quade in the field. See page 24 for the full memorial page and visit geo.arizona.edu/andy-cohen-memorial

Updates on the Graduate Program

From Director Susan Beck

Our graduate program is going strong with 15 new graduate students (7 PHD, 7MS, and 1 Professional Science Masters) joining our program in August of 2025. This number is down from last year, in part based on the uncertainties in funding going forward. The past 6 months have been uncertain for many graduate programs around the country as we wait to see what NSF, NASA, NOAA, and USGS funding will look like in the future and how international student visas are going to be handled. Currently 70% of our graduate students are funded by research grants from federal agencies or industry. It is an uncertain time for science in general and graduate students especially. Our faculty have stepped up and received a record number of funded proposals over the last year hence, we are optimistic that funding will continue.

We continue to have outstanding graduate students working in all corners of the Earth on amazing projects pushing the limits of Earth and Planetary science research. Our graduate students are working in the field around the globe, in the laboratories, and doing computational work from seismic tomography to thermochronology to climate models to machine learning. We are working hard to build our graduate program and provide not only a great research environment but also a sense of community and opportunities for professional development.

Our graduate students continue to get jobs when they graduate. We had 7 PhD students, and 4 MS students graduate in fall/spring of 2024-2025 academic year. We have 3 PhD, 1 MS and 3 PSM students that are planning to graduate in August giving us a total of 18 graduates since the last newsletter. Congratulations to all the graduating students and their advisors!

I want to highlight just a few of our outstanding graduate students. Congratulations to our Department of Geoscience outstanding graduate students in scholarship, teaching and service for the 2024-25 academic year who are Anca Barla, Asiya Badarunnisa Sainudeen and Priscilla Martinez respectively. They all did a fantastic job. Congratulations to graduate students Priscilla Martinez and Caden Howlett who co-chaired GeoDaze 2025! Thanks to all of you who supported the graduate student run symposium last March. It continues to be a highlight of the year with amazing research presentations by both graduate and undergraduate students. (see winners on page 5) I hope to see many of you at next year's GeoDaze celebration on March 26 and 27, 2026!

Thanks to all the alumni who have donated to our graduate student scholarships. These scholarships make a big impact on the graduate students as I am sure many of you remember. Despite the higher salaries that we pay now than in the past it is still financially very tight for many students as we know that the cost of living is going up in Tucson. The Department gave out nearly $100,000 in graduate student scholarships during the 2024-25 academic year with half of the scholarship funds slated for summer research activities. We had 11 graduate students receive College of Science Galileo Circle Scholarships that were also donated by alumni and friends of the College of Science. (see page 6) Our endowments for graduate student scholarships are going up, so we expect to be able to give out more scholarships in the coming years. Your contributions make a big difference to our graduate program!◆

Save the Date!

GeoDaze 2026!

March 26th-27th

GeoDaze 2025 Recap

On behalf of University of Arizona Geosciences students and the GeoDaze committee, we extend deep gratitude to our donors, alumni, and supporters who made the 53rd annual GeoDaze Symposium a success. GeoDaze 2025 welcomed over 200 participants across hybrid platforms on March 27th and 28th, showcasing research presented by students at the undergraduate, Master's and PhD levels. Building on the strong momentum of recent years, the 2025 symposium featured our highest level of student engagement yet, with sophomore through PhD students presenting exceptional research in both poster and oral formats. The quality and diversity of research on display reflect the continued strength of our department and the value of community support in fostering student success. Our keynote speaker, Dr. Sujata Murty from SUNY Albany, delivered inspiring presentations on her coral-based ocean circulation research and journey from classical music to academic research, offering insights into creative modes of scientific communication that resonated with attendees across disciplines.

As we celebrate another successful year, we hope you will consider continued support for GeoDaze 2026. Your donations go directly to student scholarships and symposium operations, helping us grow this event as our student community expands. Visit geodaze.com for award winners, abstracts, event photos, and more GeoDaze 2025 highlights.

Thank you for making GeoDaze 2025 possible and for your ongoing commitment to our students' success!

Sincerely,
Geodaze 2025 Co-Chairs, Priscilla Martinez & Caden Howlett

2025 GEODAZE WINNERS

Montgomery Associates Best Overall Talk: Madison Tuohy

The Impact of Dynamic Topography on Lava Facies: A Time-Series Analysis of Fill-and-Spill Processes at Fagradalsfjal

Nicéa Wilder Best Graduate Talk: Jim Bradford

Seismic Crustal Imaging of the Andean Cordillera at 36^{0}S Using Nodal and Broadband Seismometer Receiver Functions and First-Order Comparisons to TANGO-North

Best Undergraduate Talk: Kay Poonawala

Is the Last Interglacial Warm Period a Good Analog for Future Greenland Mass Balance?

Best Economic Geology Talk: Lucas Brown

Geologic, Geochronologic, and Petrographic Characterization of Imlay District Mineral Systems with a Focus on Florida Canyon

Best Climate & Paleoclimate Talk: Alexandra O'Keefe

Calibrating Benthic Individual Foraminifera Analyses (BIFA): Bottom Water Variability or Bioturbation Proxy?

Best Geophysics Talk: Sankha Subhra Mahanti

Orogen-Parallel Variations in Seismicity in the Central Andes Recorded by the TANGO Seismic Deployment

Best Tectonics & Geochronology Talk: Luke Basler

Crustal thickness and paleoelevation of the North American Cordillera since the Late Cretaceous

Best Geochemistry/Geomorphology Talk: Isaiah Spring

Microstructural analysis of lunar dunite clast from meteorite NWA 11421 and physical constraints on the excavation of upper lunar mantle

Best Graduate Poster: Asiya B. Sainudeen

Exploring the Moisture Sources and Pathways for South American Rainfall Using Variable-Resolution CESM Simulations

Best Undergraduate Poster: Caitlin Salanga

Identifying tropical Pacific climate and hydroclimate changes through the transition from Preindustrial to Industrial time using coral skeletal geochemistry

Runner-up Graduate Poster: Joaris Hernandez Morales

Reconstructing hydroclimate variability from heavy-metal discharge at the Majuro Atoll, Marshall Islands

Runner-up Undergraduate Poster: Malath Ali Alyousef

Hydrogen Partitioning in Lunar Orthopyroxene: Implications for Lunar Mantle Dynamics and Magma generation

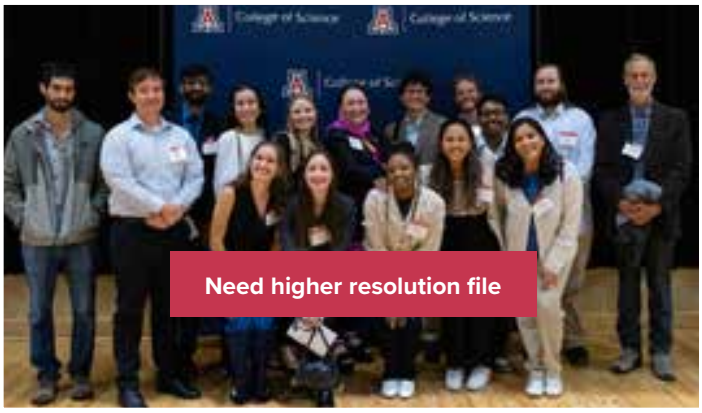
Department Wows

This year, the University of Arizona tied for **No. 50 in the world in the physical sciences** in Times Higher Education's World University Rankings by Subject 2025. Among the disciplines assessed are geology, environmental, earth, and marine sciences. That's us! We are proud to retain rankings at **No. 4 in Earth sciences**, **Geology at No. 5**, **Geochemistry at No. 6** and **Geophysics/Seismology at No. 15**. This wouldn't be possible without our amazing faculty, students, and staff. Thank you everyone!

STUDENTS

Over the course of the last year, our students, both Graduate and Undergraduate, have accomplished some exciting things!

15 Geosciences students were named 2024 Galileo Circle Scholars



- **Jim Bradford** (Patrons: George and Merrily Davis)
- **Aniket Dhar** (Patrons: Stanley and Pamela Hart)
- **Ken Gourley** (Patrons: Ray Leonard and Cheryl Phillips)
- **Bridgett Holman** (Patrons: Thomas and Irene Keating)
- **Tshering Lama Sherpa** (Patron: Louise Glasser)
- **Joses Omojola** (Patrons: Research Corporation for Science Advancement/Danny Gasch)
- **Katleho Ramotso** (Patrons: Jim and Glenda Gentile)
- **Anna Rebaza Morillo** (Patron: Susan G. Earl Galileo Circle Scholarship Endowment)
- **Pratik Santra** (George and Ann Mavko)
- **Camila Sojo-Aguero** (Patrons: Mark and Helene Sbar)
- **Isaiah Spring** (George and Ann Mavko)
- **Angela Tatsch** (Patrons: Doris Coris/Coris Family Galileo Circle Scholarship Endowment)
- **Jordan Wang** (Patron: Norman Komar)
- **Alexus Wuertemburg** (Patron: Patricia Morgan/Peter F. Salomon and Patricia Carr Morgan Galileo Circle Scholarship Endowment in Memory of Todd C. Morgan)
- **Nitzan Yanay** (Patrons: Mark and Helene Sbar).

Congratulations to the Geosciences 2025 College of Science Graduate Student Award winners.

- Scholar Award: **Anca Barla**
- Service Award: **Asiya B. Sainudeen**
- Teaching Award: **Priscilla Martinez**

Undergraduate students **Katleho Ramotso** and **Handan "Hannah" Mo** were recognized as this year's Fall and Spring Outstanding Seniors from the Department of Geosciences by the College of Science. This award goes to the students who "went above and beyond during their time as a Wildcat". Hannah plans to begin graduate studies in 2026 after a well deserved gap year and Katleho will be starting the Master's degree program in Geosciences here at the University of Arizona this Fall.

Kay Poonawala received the Geosciences Excellence in Undergraduate Research Award from the College of Science this Spring. Students that are nominated make a significant contribution and show originality, creativity, and a level of independence appropriate to their academic discipline.

PhD graduate student **Sankha Subhra Mahanti**, winner of Grad Slam 2024, was the only graduate student to give a talk at TEDx U of A in October. His talk, titled "Beyond the Big Ones", shed light on the importance of gleaning information from smaller earthquakes to better understand our planet.

Graduate student **Mudith Weerabaddana** placed 3rd in Grad Slam 2025 with his talk titled "Reading Corals: Unraveling the Mysteries of Ocean History" which elaborated on how important freshwater is to the people living in tropical Pacific islands.

Graduate student **Guido Merino** was awarded a Graduate Student Fellowship from the Society of Economic Geologists as being named a Galileo Circle Scholar for 2025.

FACULTY

University of Arizona Geosciences faculty had a great year! Over the course of the last fiscal year, Geosciences has increased its award revenue by 74%. Faculty in Geosciences submitted 50 proposals and received 17 awards with an impressive win rate. Thank you to Erin Gill, Senior Research Administrator on the SPS Proposal Support Team, for aiding in the proposal process and contributing to such great results for the year.

Firstly, congratulations to Professor **Mihai Ducea** on being named a Fellow of the American Geophysical Union (AGU), the world's largest organization of Earth and space scientists. Only a tiny fraction (0.1%) of AGU members achieve this status. Fellows are nominated on the basis of making "exceptional contributions to Earth and space science through a breakthrough, discovery, or innovation in their field". (agu.org/honors/union-fellows) "Being an AGU fellow is an achievement that adds to the total number of fellows in the University of Arizona Geosciences Department – the highest density per capita of AGU fellows among all geoscience departments anywhere," Ducea shares, "An immense honor, I am lucky to be part of that select group and share this with all my colleagues and friends from Gould Simpson."

Professor **Jay Quade** was officially inducted into the National Academy of Sciences. His election made an exciting media run last year. He also received the University of Utah Alumni Award.

Regents Professor Emeritus **George Davis** was awarded the Raymond M. Turner Award for his significant and long-term contributions in service to the Saguaro National Park through science and education. The award is named in honor of the late Sonoran Desert ecological pioneer Ray Turner.

Professor Emeritus **Bob Downs** got the cover of *Science* for his co-authored study of the carbonates on Mars. Bob contributed to identifying the carbonate and determining its chemical composition. Find his cover and others from our awesome geos community in the Gould-Simpson lobby.

This year's GeoDaze Outstanding Faculty Award went to Associate Professor **Mauricio Ibañez-Mejia**, nominated by fellow faculty members.

Assistant Professor **Ananya Mallik** was awarded an NSF CAREER Grant for groundbreaking research on nitrogen dynamics in earth systems: "Evaluating the Continental Crust as a Key Reservoir of Earth's Nitrogen and Constraining the Nitrogen Abundance of Primitive Arc Magmas". The grant was featured in the U of A Provost's Digest and College of Science News.

STAFF

Thank you to our amazing staff who worked hard this year to help Geosciences stay at the top.

Congratulations to Business Manager **Pat Waters** who received the College of Science Staff Advisory Council Star Award. Geos staff worked together to nominate Pat for this exciting honor. The U of A Star program was created to increase the opportunity and frequency of staff receiving a "public pat on the back" for a job well done.

Congratulations to Grants and Contracts Administrator **Heather Alvarez** on winning not only the Staff Excellence Award for Geosciences at this year's College of Science Staff Advisory Council Brunch, but also the Best of the Best Award. While the Staff Excellence Award is selected by respective department heads based on nominations, the Best of the Best Award is hand selected by the Dean of the College of Science. This award is well deserved as Heather's wealth of knowledge about the department and dedication to the business office for over 20 years should not go unnoticed. "I was incredibly surprised when Dean Garzione called my name for the Best of the Best Award," Heather shared, "The College of Science has so many talented hardworking staff members and I am grateful to the Dean for choosing me. It was one of my proudest moments as a Wildcat and it felt great to have 20 years of hard work acknowledged in front of my peers."

Meet our newest staff member, **Marlise Bourland**. Marlise joins the department as the new executive assistant to the department head who oversees room and course scheduling, faculty affairs, space, event coordination, and departmental administrative support. Marlise has worked at the University of Arizona for over 12 years and is excited to continue her professional journey in Geosciences. Having recently reached her six-month milestone with the department, Marlise shares that she admires how the department values and supports its staff and appreciates the teamwork within the business office. She notes that there is always someone available to help when questions arise. Marlise has enjoyed getting to know the Geosciences community and learning about the department's research initiatives. She looks forward to contributing to the department's success.

News

Geosciences faculty, students, and staff have had a stellar year. From published papers and media features to awesome field trips and winning campus wide events, we are proud of the people under our roof and the work that is being done here.

FACULTY

PROMOTIONS

- **Marcus Lofverstrom** promoted to Associate Professor with Tenure
- **Kaustubh Thirumulai** promoted to Associate Professor with Tenure

PAPERS AND PUBLICATIONS

- Professor **Barbara Carrapa** and team (Professors **Peter DeCelles**, and **Mihai Ducea**, and Postdoctoral Researcher **Clay Campbell**) published a paper in *Geology*. "Crustal bobbing in response to lithospheric foundering recorded by detrital proxy records from the central Andean Plateau"
- Professor Emeritus, **Jiba Ganguly** in *Earth and Planetary Science Letters:* "Thermodynamics of light elements stratification in the earth's outer core and implications"
- Associate Professor **Marcus Lofverstrom** in *Nature Climate and Atmospheric Science:* "Rapid decline and mortality of a pleistocene-aged forest now submerged in the northern Gulf of Mexico, USA"
- Professor **Jess Tierney**, along with co-author Emily Judd, a former U of A postdoc, in *Science:* "A 485-million-year history of Earth's surface temperature." The author team did interviews with reporters from the Wash Post, NYT, BBC, Bloomberg.
- Professor Emeritus **George Davis** in *GSA Bulletin:* "Transverse faulting in the Paradox Basin, Colorado Plateau, USA: Active, intermittent faulting over a 300 million year history of strain accommodation and fluid flow"
- Associate Professor **Jonny Wu** co-authored a paper in *Geophysical Research Letters:* "Revealing the Cape Verde Hotspot Track Across the Great Lakes" The paper received news coverage including Newsweek.
- Professor Emeritus **Vance Holliday** and colleagues in *Science Advances:* "Paleolake geochronology supports Last Glacial Maximum (LGM) age for human tracks at White Sands, New Mexico"
- Associate Professor **Mauricio Ibañez-Mejia** in *Geology:* "A mantle-plume trigger for one of Earth's largest Precambrian silicic large igneous provinces in the Amazonian Craton"
- Associate Professor **Kaustubh Thirumalai** in *Nature Geoscience:* "Extreme Indian summer monsoon states stifled Bay of Bengal productivity across the last deglaciation". The story was picked up by the College of Science.
- Professor Emeritus **George Davis** along with Professor **Susan Beck** in Hesperia, *The Journal of the American School of Classical Studies at Athens V. 93:* "Thunder, lightning, and earthquakes and their impact on the Sanctuary of Zeus on Mt. Lykaion"
- Professor Emeritus **George Davis** in *Geology of Utah's Parks and Monuments:* "Geology of Bryce Canyon National Park"

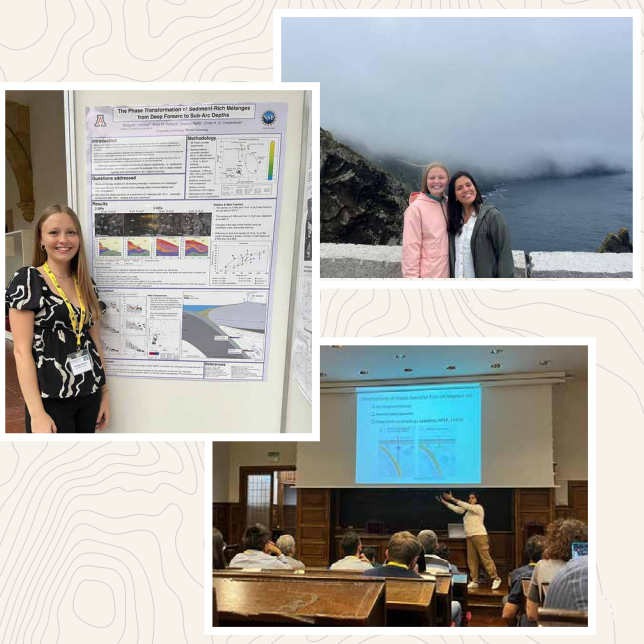
OTHER HIGHLIGHTS

- Assistant Professor **Ananya Mallik** and Professor J**ess Tierney** became executive editors of a newly formed journal, *Advances in Geochemistry and Cosmochemistry*. It joins the club of several recently formed, open access journals that are free to publish and free to read. Please help spread the word about efforts to make scientific publishing more accessible. Additionally, Ananya, along with Assistant Professor **Pranabendu Moitra**, were featured in the Arizona Astrobiology Center's "AABC Meets" series that highlights faculty whose research allies with their own.
- Associate Professor **Diane Thompson**, along with University of Michigan Professor Julia Cole, were featured in a Disney+ documentary for their work in the Galapagos. This is a big win for coral paleoclimate and U of A scientists. Check out "Guardians of the Galapagos" on Disney+ today!
- **Karl Flessa**, Professor Emeritus, and Researcher **Martha Gomez-Sapiens** secured their contract with the International Boundary and Water Commission, with funding to continue through 2026 and possibly beyond. Karl was also featured in NPR discussing woolly mice and woolly mammoths. He stated "They sort of want to mess around on a pretty large scale...I'm not ready to play God like that"
- Professor **Barbara Carrapa** was recognized for delivering a lecture at UMSA in flawless Spanish.
- Professor Emeritus **George Davis**, along with recent graduate **Lauren Reeher**, were able to cross the finish line on their research on transverse faulting in the Paradox Basin. This is part of the effort led by **Pete Reiners** on investigating fluid flow in the Paradox.

- **Advait Jukar**, previous faculty member now a curator of vertebrate paleontology at the Florida Museum of Natural History was featured in a write up about some research he did while here at the University of Arizona. “Rare fossils of extinct elephant document the earliest known instance of butchery in India” (floridamuseum.ufl.edu)
- Assistant Professor **Chris Harig** co-authored an article in *Nature* titled “Community estimate of global glacier mass changes from 2000-2023” which was also picked up by U of A News. He also worked with Professor **Ali Behrangi** of Hydrology and Atmospheric Sciences on a story about Snow4Flow, which was picked up by Arizona Public Media. They are also included, along with Professor **Jack Holt**, in the New Frontiers segment which contains the Snow4Flow piece along with Europa Clipper and OSIRIS-APEX.
- Professor **Jack Holt** published an article in the New York Times featuring his study and measurement of the Ruth Glacier and its immense hidden cavern. The paper in the Journal of Glaciology was led by Jack’s former student, **Brandon Tober**. He was also featured in U of A News in a story about World Water Day.
- A big shout out to Associate Professor of Practice **Jess Kapp** for stepping into the Undergraduate Advisor role this year. Students and staff alike appreciate her willingness to step up to the plate and do the best job possible. Thank you, Jess!
- Associate Professor **Patricia Persaud** was featured in *GSA Today* for an article on broadening participation titled “Volunteer-Led, Short-Term, Geophysical Field Experiment: Lessons for Inviting Broader Participation, Building Public Trust, and Communicating Science”.
- University Distinguished Professor **Joellen Russell**, lead for the modeling theme of the Southern Ocean Carbon and Climate Observations and Modeling project (SOCCOM), shared that the project received a 3 year, $9.5 million extension. “We can’t wait to tackle the changes in ocean carbon, heat and greening going on in the Southern Ocean with new climate modeling, ocean data assimilation and robot floats,” she shared. This year Joellen also attended the lab review of NOAA’s Geophysical Fluid Dynamics Laboratory.

STUDENTS

- Undergraduate student **Robert Leenhouts** wrote a letter to the editor that was featured in the *Arizona Daily Star* regarding the dangers of potentially exposing people, especially children, to lead inhalation through airborne dust. This was a response to an op-ed covering a proposal to locate a lead-laden mining tailings pile near a residential area of Tucson. “It means a lot to me that my voice is being heard on this matter. In the future, I plan on working in a field that contributes to conservation, perhaps in academia or the NPS. I’m deeply grateful for the amazing professors, like Dr. Sheppard, who have enriched my understanding of Earth sciences, and have inspired me to continue to learn and be curious.”
- Recent graduate **Dr. Emilia Caylor**, along with co-authors Professors Barbara Carrapa, Pete DeCelles, and George Gehrels, published a paper in *Basin Research*. “The real McCoy: A record of deep-water basin deposition in southwestern North America during the cretaceous.”
- Recent graduates **Anna Rebaza** and **Bridgett Holman** (both of whom worked with Assistant Professor Ananya Mallik) went on a field trip to Cabo Ortegal, Spain, to study mantle exposure and adjacent high pressure-temperature rock units. Bridgett presented her poster at the 7th Annual Lherzolite meeting in Oviedo and Anna’s research was published in *Earth and Planetary Science Letters*. “The fate of ultramafic-rich mélanges in cold to hot subduction zones: Implications for diapirism (or not) and chemical geodynamics.”
- Graduate student **Priscilla Martinez** published a paper with advisor Professor Barbara Carrapa titled “Controls on late Miocene marine vertebrate bonebed genesis in northern Chile” in *Science Direct*.
- **Arkadeep Roy** of Ananya Mallik’s group (also a NASA FINESST Fellow) published an EGU blog about his research titled “How Hot our Moon Can Get: Mapping Radioactive Elements and Thermal State of the Lunar Interior”. Arka also led a new publication in American Mineralogist by Ananya Mallik’s group titled “Miyake-jima anorthite: A lunar crustal material analog”.
- Recent graduate, **Tshering Z.L. Sherpa** published a paper with Professors Pete DeCelles and George Gehrels in AGU’s *Tectonics* titled “Tectonic Evolution of the Himalayan Fold-Thrust Belt in the Okhaldunga Region, Eastern Nepal”
- Recent graduate **Caden Howlett**, along with Professors Pete DeCelles, Barbara Carrapa, and fellow graduate student **Chance Ronemus**, published a paper in AGU’s *Tectonics* titled “Miocene Construction of the High Andes Recorded by Exhumation of the Frontal Cordillera, La Ramada Massif of Western Argentina (32°S)”



- Recent graduate **Nitzan Yanay** published a paper in *GCA* titled "Alteration of carbonate clumped isotope composition by burial heating in foreland sediments of the Himalaya" (co-authors Jay Quade, Zhennan Wang, David Dettman, and Muhammed Tahir Waseem of the Pakistan Museum of Natural History)
- Geosciences students were featured with University of Arizona robot floats on 12News Phoenix in a story titled "Arizonans are using ocean robots near Antarctica to better forecast desert weather"
- Graduate student **Guido Merino** co-authored an abstract for an oral talk with **Maria Camila Sojo Aguero**, titled "The distribution and origin of silver enrichment in the Filo del Sol porphyry-epithermal Cu-Au-Ag deposits, Vicuña District, NW Argentina", for the SGA Biennial Meeting 2025 in Golden, Colorado.
- Graduate students **Madison Tuohy** and **Holly Thomas** took some of our newer grad students on a hike in the Chiricahuas, followed by a trip to Patagonia Lake for swimming, and finally Sonoita's wine region. In this photo everyone is "acting out their research" and yelling "Ahoy, awesome geoscientists!" for every photo.

STAFF

The Joggernauts do it again! Each year Life & Work Connections at the University of Arizona hosts a campus wide event called Move Arizona, previously known as Walk Arizona. It takes place over eight weeks each spring with the goal of empowering university employees to achieve 150 minutes of movement a week as recommended by the U.S. Department of Health and Human Services. While Move Arizona isn't labeled a competition, participating teams are put on a leaderboard, showcasing that team's weekly minutes.

Representing Geosciences each year are the Joggernauts, a team formed over 8 years ago. Grants and Contracts Administrator and Geosciences Wellness Ambassador Heather Alvarez has led the Joggernauts to multiple victories. This year, the Joggernauts won again with the help of McKenzie Meza, Lili Schwartz, Marlise Bourland, Joellen Russell, Pat Waters, Rocina Garcia, Denise Carillo, Mauricio Ibanez-Mejia, and Lael Vetter. In total, the team clocked over 53,000 minutes from February - April.

"Move Arizona is one of the things that our staff looks forward to each year," Heather shared, "Every January I am bombarded with messages from team members inquiring about the start of that year's program. The comradery that each Joggernauts team has shown since our inception is different from any other team that I have been a part of. We push each other to fight another week, pick up each other's slack, and we get excited to see our names at the top of that leaderboard (yes - we view it as a competition). The team truly has some inspirational members and I am proud to be team Captain of such an awesome group!"

While the team itself has seen changes over the years, some names remain dedicated to the cause. "I have been lucky enough to have participated in Move Arizona since 2018 with Heather as a team captain," said Lili Schwartz who has been on the Joggernauts since her time with MCB/EEB, "The motivation and excitement that Heather brings to our team is invaluable. The competition from other departments challenges you to move and add minutes to your daily schedule."

The Joggernauts are a force to be reckoned with, maintaining a top 3 finish every year for the last 4 years alone. Business

Manager Pat Waters, not only contributes some impressive minutes, but also supports the team by setting up outings. This year, she led the Earth Sciences team on a hike at Sabino Canyon, helping Joggernauts get minutes and escape the stressors of work.

"After stressful holidays full of over indulgence, Move AZ really helps to jump start the new year in a very healthy way," Pat noted, "The best part has always been our Team Captain, Heather Alvarez. She motivates us like no other and her enthusiasm is contagious! I know we'd never have made it first place at all without Heather's hysterical memes, fitness suggestions and her own inspirational performance. She is the heart and soul of the Joggernauts!"

Overall, when Move Arizona starts back up every February, everyone knows to keep an eye out for the Joggernauts. Thank you again to valiant team Captain Heather for reminding everyone to get moving and inspiring the motivation to win!◆

CLUB UPDATES

What have our student clubs been up to?

Southern Arizona Chapter of the Association for Women Geologists (AWG)

Now in our 7th year as a chapter, Southern Arizona AWG has had an outstanding 2024-2025 academic year.

This year, we successfully raised over $700 for our Annual Undergraduate Field Experience Scholarship and awarded 2 scholarships to students attending field camp during Summer 2025. Community building efforts included hosting multiple colloquium breakfasts with diverse professionals, including our annual AWG-GeoDaze breakfast featuring Dr. Sujata Murty, and maintaining our undergraduate mentorship program. We also collaborated with UA's GeoClub to host a "Demystifying Graduate School" workshop, which brought together graduate students, post-doctoral researchers, professors, and industry professionals.

Our gear closet initiative continues thriving, fulfilling over 50 equipment requests and supporting an estimated 35+ students since its launch in late 2023. We are grateful for the UA Department of Geoscience and our broader southern Arizona community for their continuous support, and look forward to another productive year with a brand new officer board!

— Priscilla Martinez, *on behalf of AWG*
2023–2025 Southern AZ AWG President

Society of Earth Science Students

What a gneiss time to be a part of SESS!

SESS has been up to many things this year, from picnics under the Arizona sun to Jeopardy and Family Feud game days! In addition, the Society of Earth Science Students lived up to its name at the Tucson Gem and Mineral Show, teaching young kids all about minerals, fossils, and tectonic plates! SESS also saw some geology itself; the club hit the road for spring break, leaving Tucson behind for Zion National Park! For five days, SESS camped and hiked through the beautiful rocky landscape. Although the club returned dirtier and smellier than when we left, we also came back with some amazing memories! Make sure to stop by SESS this year to make some new memories as well (see page 27)!

GeoClub

Last year, GeoClub and AWG launched a new event designed to demystify the graduate school application process. It was such a success that we're excited to bring it back this fall! In addition to the "Intro to Grad School" session, this fall we'll be hosting an overnight camping trip on Mount Lemmon, as well as our annual Halloween party, open to all graduate students. Looking ahead to the spring, don't miss our annual GeoDaze After-After-Party, where grad students get to pick the theme. Last year's "Fantasy Forest" theme brought some incredible costumes, and we can't wait to see what this year brings! If you're a grad student in the department, keep an eye on your email for details about these events, including our Welcome Back Happy Hour to kick off the semester

– Alexandra O'Keefe, *on behalf of GeoClub*
GeoClub President

UPDATES

The latest from the Arizona LaserChron Center

Background

The Arizona LaserChron Center (ALC) is an NSF-EAR Community facility that supports Earth Science research through the generation of U-Th-Pb geochronologic data and geochemical information by Laser-Ablation ICP Mass Spectrometry. Primary goals are to:

1. Generate U-Th-Pb ages, Lu-Hf isotope ratios, and trace/REE concentrations of the best precision, accuracy, efficiency, and spatial resolution.
2. Provide opportunities for researchers from around the world (especially NSF-supported scientists) to use our instruments and expertise.
3. Drive the development of new techniques and applications of geo/petro/thermochronology.
4. Build new cyberinfrastructure for data acquisition, analysis, and archiving.
5. Use every aspect of facility operation to increase access to geochronology and enhance expertise and diversity among users of geochronology.

Funding

The ALC has continuously operated as a facility since 2005, with progressively growing impact every year (Fig. 1). In 2024, we obtained new funding from the Instrumentation and Facilities (IF) program of the National Science Foundation (NSF) to continue operating as an EAR Track 3 Community Facility for another five years (2024–2029). This funding cycle will see the ALC continue to expand operations to serve a larger number of visitors from a wider range of institutions, addressing a growing range of science questions. These objectives will be achieved through i) deploying new instrumentation to expand capacity; ii) develop new analytical methods that can help answer new questions regarding the timing and mechanisms of a wider range of geologic processes; and iii) continue to train the next generation of geochronologists and 'geochron-savvy' Earth Scientists at multiple education levels in academia, industry, and government. Below we provide an update on how ALC is tackling these objectives from the technical-infrastructure (i.e., instrumentation and methods) as well as human-infrastructure (i.e., facility impact and training) perspectives.

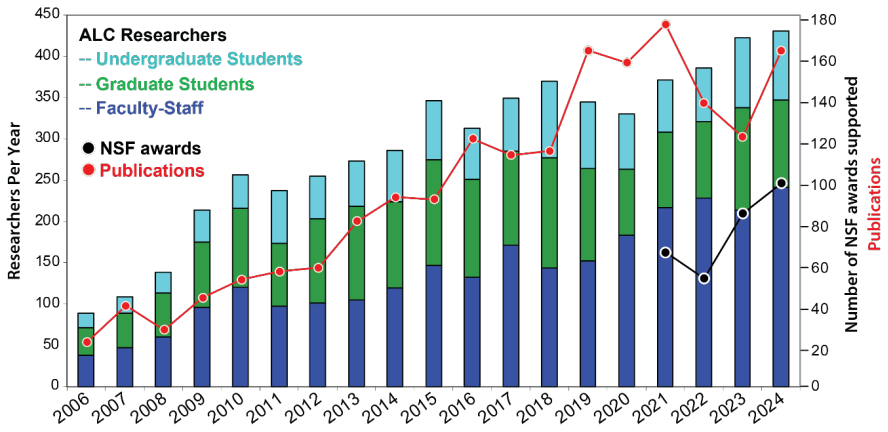


Figure 1: Number of ALC researchers and related publications.

Instrumentation and Methods

This past year saw the ALC complete several major instrumentation milestones which are transforming our analytical and technical capacity.

1. With support of NSF's Major Research Instrumentation (MRI) program and cost sharing provided by GEOS, CoS, and R&P, we finalized the deployment of ALC's new Thermo Neoma MC-ICP-MS/MS. With its wider and more flexible collector configuration and higher analytical sensitivity, the Neoma is transforming ALC's ability to access a wider range of isotopic systems we could not explore with previous instrumentation. This instrument is also allowing us to continue pushing the limits of the spatial resolution accessible using LA-ICP-MS, and in coming years, will enable developing novel geochronologic techniques leveraging collision-reaction technology (e.g., in-situ Rb-Sr). At the time of closing of this MRI award in Summer 2025, the acquired instrumentation has directly impacted the research of 193 ALC researchers visiting from US research Universities (82%), Primarily Undergraduate Institutions (13%), industry (2%), and other institutions (3%) such as science museums and state and federal surveys and other agencies.
2. With support from GEOS, CoS, R&P, and in partnership with ThermoFisher Scientific, we completed the upgrade from our older NU Instruments HR-MC-ICP-MS to a Thermo Neptune Plus MC-ICP-MS that has been factory-refurbished to as-new conditions. As of March 2025, the Neptune is fully operational and is becoming ALC's 'workhorse' for zircon Lu-Hf analyses, as well as U-Pb in zircon and other accessory minerals such as apatite, titanite, monazite, and rutile.
3. We completed installation of our iCap quadrupole ICP-MS, and implementation of analytical methods for zircon U-Pb geochronology using this instrument. While the iCap was critical for providing additional U-Pb

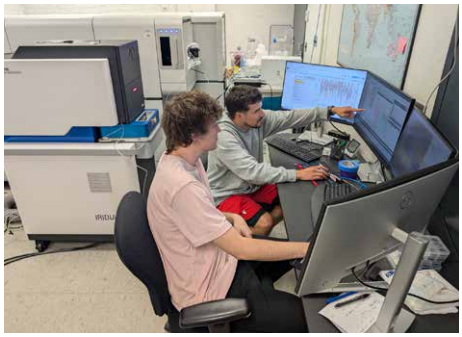
capacity during our transition from the NU Plasma to the Thermo Neptune Plus, moving forward the iCap will be dedicated to operating in tandem with the Neptune for Laser Ablation Split Stream (LASS) methods. The LASS method will enable acquisition of U-Pb geochronologic information and Trace Element concentrations simultaneously from a single ablation spot, enabling uncompromising data quality and spatial resolution for petrochronologic research applications.

4. Following installation of ALC's new Renishaw micro-Raman spectroscopic system in 2023, in Fall 2024 we completed developing methods and data processing routines for quantitatively mapping radiation damage in zircon. In combination with SEM imaging and LA-ICP-MS analyses, this new method is adding additional dimensions to explore the textural, age, and trace element complexity of igneous, metamorphic, and detrital zircon, and is beginning to be routinely used by ALC visitors. We are currently developing methods for quantifying and mapping radiation damage in other accessory phases (e.g., monazite and baddeleyite) using our Raman, as well as leveraging radiation damage as a low-temperature thermochronologic tool for sediment provenance and tectonic applications.

5. With support from GEOS, CoS, R&P, and in partnership with Teledyne Technologies, in 2025 we acquired a new state-of-the-art Iridia laser ablation system. Installed in August of this year, the new Iridia is being coupled with our Thermo Neoma MC-ICPMS. Combining these two next-generation instruments will allow ALC to continue pushing the frontiers of geochronologic research using state-of-the-art LA-ICP-MS technology.

Facility Impact and Operations

From June 2024 through May 2025, the first year of our new funding cycle, the ALC collaborated with a record 432 researchers from 153 different institutions, supported 195 different projects (100 of those NSF funded), and reported data in 167 peer-reviewed publications (Figure 1). We continued to place a major emphasis on involving students in all aspects of ALC operation, in an effort to continue training the future workforce of geochronology-savvy geoscientists. Travel, subsistence, and analytical costs for student researchers were subsidized using NSF Participant Support funds, and this has been very effective in increasing the number of undergraduate and graduate students who visit ALC as it incentivizes PIs to involve more students in their research without spending additional resources. Out of the 432 researchers with whom ALC collaborated during this period, 44% (n= 190) were students, including 84 undergraduates and 106 graduate students. Student researchers visited from 83 different institutions representing 32 different states, 2 mining companies, and 6 international institutions of higher education. Of the 152 different institutions represented by our visitors over the past year, 70% were from US Universities and Colleges, 9% from Industry, 8% from State Surveys, 7% from foreign universities, and 5% from other institutions such as science museums and US federal agencies (Figure 2).



PhD student Dan Alberts (right) showing post-baccalaureate researcher Ari Dettman (left) how to run instruments. The instrument in the background is the Neoma MC-ICPMS acquired using NSF MRI funds, and the instrument in the foreground is the brand new Teledyne Iridia laser ablation system (installed in early August 2025!) which was acquired through cost-sharing using TRIF funds provided by R&P, CoS funds, GEOS funds, and ALC funds.

Operations at ALC are possible thanks to a fantastic group of enthusiastic and highly capable researchers and staff. These included our general lab manager Dr. Mark Pecha, six postdoctoral scholars (Drs. Clay Campbell, Michelle Foley, Aleisha Johnson, Patricia Kang, Martin Senger, and Yanling Wang), PhD student Dan Alberts, accountant Heather Alvarez, post-baccalaureate staff members Ari Dettman, Vicente Lopes, and Tristan Nolan, Ken Kanipe, and multiple undergraduate and graduate students who continuously support ALC activities at all levels. Operations are overseen by ALC co-directors Profs. Mauricio Ibañez-Mejia and George Gehrels.

In summary, with the new funding, instruments, methods, incredible staff, and continued support from NSF, GEOS, CoS, and UA R&P, the ALC is poised to continue being a US and global leader in geochronology applied to Earth Science research. The future is bright at ALC, and we hope to see many of you visiting our facilities soon. Stay tuned for more exciting updates!◆

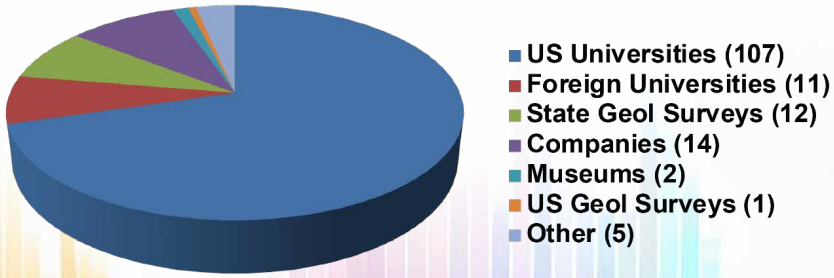


Figure 2: Institutions served during 2024 (n=152).

FACULTY RESEARCH SPOTLIGHTS

From Carbon to Crust: Laboratory Insights into Earth and Lunar Evolution

Assistant Professor Ananya Mallik

Assistant Professor Ananya Mallik is an 'experimental petrologist'. She primarily uses laboratory experiments to simulate conditions in the interior of the Earth and other planetary bodies to evaluate processes that are fundamental to understanding the evolution and differentiation of planets, and yet are otherwise inaccessible. Her research uses natural observations and thermodynamic modeling to validate the results from the laboratory simulations. Her research is funded by NSF and NASA. Below are what her group members are doing these days:

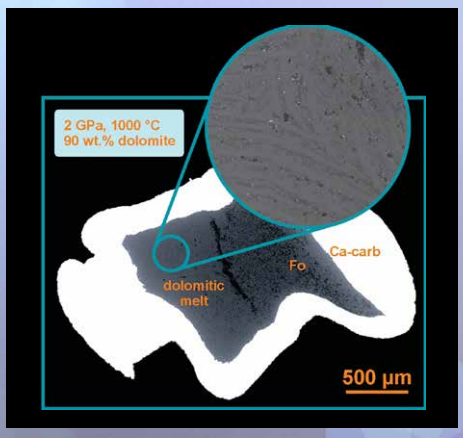
Postdoc **Marija Juriček** is investigating how plate tectonics and subduction redistribute carbon between the Earth's surface and deep mantle reservoirs by focusing her research on the fate of thick carbonate platforms as they enter the Earth's interior via subduction using laboratory simulations. In collaboration with Mihai Ducea, Marija will use observations from nature to validate the laboratory models.

PhD candidate **Anna Rebaza**'s research focuses on mass transfer processes in subduction zones that determine how our planet differentiates. Her research using laboratory simulations and geodynamic analyses, shows that while buoyant 'balloons' of rock may also rise from slabs only when certain conditions are met, dehydration and/or melting of the slab in subduction zones dominantly move or redistribute material in subduction zones. Anna published her research in Journal of Petrology and Earth and Planetary Science Letters, and has another manuscript in revision in Journal of Geophysical Research- Solid Earth.

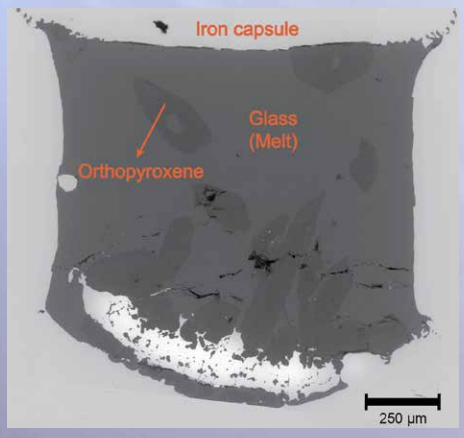
Postdoc **William Nelson**'s research focuses on crust formation in planetary bodies. Crusts are the only reservoir that directly communicate with the exosphere and interior and are the solid reservoir accessible to planetary missions. Thus, understanding crust formation is key to using the crust as a tracer for overall planetary evolution. The Moon is perhaps the best natural laboratory in our Solar System. Accordingly, William's research is geared towards investigating the process of crust formation using laboratory simulation and coupling that with analysis of Apollo samples.

PhD candidate **Arkadeep Roy** is studying how wet or dry the Moon is. He simulates the conditions of the early Moon in the laboratory and looks at how tiny amounts of water are stored in minerals that normally don't hold water. His research shows that the interior of the Moon is much drier than the Earth and may hold water worth one to three times that of the Great Lakes in North America. It can particularly help us explain how some unusual, water-rich volcanic rocks formed on the Moon's surface, which unravels new clues about how the Moon evolved. Arkadeep recently published an article in American Mineralogist about how we could use feldspars from a volcano in Japan as a lunar analog to help us understand the Moon's crust formation better.

PhD candidate **Isaiah Spring**'s research focuses on the magmatic differentiation of the Moon. His recent publication under revision in Meteoritics & Planetary Science presents the most comprehensive trace element analysis of the most pristine lunar crustal sample, and the results provide key constraints on the earliest lunar magmatic events. He also recently completed a microstructural and trace element study of the only meteorite sample from the lunar mantle. These analyses have the potential to significantly advance our understanding of the Moon's interior evolution. Isaiah and



Laboratory experiment showing the fate of dolomites at about 60-65 km depth inside the Earth



Laboratory experiment showing the expected minerals that crystalize from a magma ocean that made the solid body of the Moon

Ananya and Isaiah picking mineral grains from an Apollo Moon sample at Johnson Space Center, NASA, Houston, TX

Ananya, recently returned from NASA's Johnson Space Center, where they selected new samples for upcoming trace element analyses.

The undergraduate researchers are rocking it. **Bridgett Holman** (mentored by Anna) and **Karla Castro** (mentored by Isaiah) graduated in Spring 2025. Bridgett started a PhD at Lamont Doherty Earth Observatory at Columbia University, while Karla started as an exploration geologist at the mining company ASARCO. **Malath Ali** Alyousef (mentored by Arkadeep) was the runner-up for 'Best Undergraduate Poster' at GeoDaze 2025, and **Sam Mosteller** (mentored by Marija) is researching carbon subduction.

From subaerial to submarine to planetary: Understanding the dynamics of volcanic eruptions

Assistant Professor Pranabendu Moitra

Volcanic eruptions cause socio-economic destruction while providing a window to the physicochemical conditions at the interior of a planet. Therefore, it is important to better understand the conditions that lead to non-explosive to explosive styles of volcanic eruptions. During an eruption, magma ascends from a crustal chamber to the surface with suspended crystals and bubbles (exsolved gases) that determine the explosivity of the eruption. Using laboratory experiments, numerical modeling, and sample analysis, the volcanology group in U of A Geosciences tackles a range of research problems that include small-scale bubble-crystal interactions and multiphase magma rheology to large-scale dynamics of subaerial and subaqueous volcanic eruptions.

Firstly, our team congratulates **Rebecca (Beckie) Fulton** for her successful graduation (MS) in Spring 2025. Also, we look forward to welcoming graduate student **Carolyn (Carrie) Drake** and undergraduate student **Terra Aust** to our research group this Fall. Meet our current team below!

The volcanology research group had an eventful year, with some of the following research directions highlighted.

Submarine volcanic eruptions

Recently graduated **Rebecca (Beckie) Fulton**'s research dealt with magma-water interaction dynamics using high-temperature experiments with implications for the dynamics of the submarine volcanic eruptions. Undergraduate student **Angus Grieve** and Senior Research Engineer **Benjamin McElhaney** helped with some of the experiments. Beckie gave an oral presentation at an international volcanology conference, IAVCEI, this summer and is currently revising a manuscript on her MS thesis work.

Team: from left to right – Weiwei Ma (PhD track), Angela Tatsch (senior undergraduate researcher), Rebecca Fulton (MS, Spring 2025), Pranabendu Moitra (Assistant Professor), and Pratik Santra (PhD candidate).

Rheological characteristics of multiphase magma

Undergraduate student **Angela Tatsch** has been working on the extensional rheology of crystalline magma that affects bubble growth and the explosivity of volcanic eruptions. Angela has recently presented her research at the IAVCEI conference, and is working on a manuscript on this work.

Also, PhD track student **Weiwei Ma** joined our team in Fall 2024 and has made significant progress in designing bubble- and crystal-bearing magma rheology experiments using analog materials. Weiwei will present her research outcomes at the 2025 fall meeting of the American Geophysical Union.

Planetary volcanology

PhD candidate **Pratik Santra** has been analyzing the physicochemical characteristics of lunar volcanic samples returned from the Apollo 15 and 17 missions. The new sample request was approved by NASA's Astromaterials Allocation Review Board (AARB) earlier this year. Pratik aims to use the observational constraints in eruption models to better understand the conditions that led to the effusive-explosive style volcanism on the Moon.

Along with the above-mentioned projects, Assistant Professor Pranabendu Moitra has published 2 papers (see references) that include contributions from some of the team members. Pranabendu presented his research at the Lunar and Planetary Science Conference (LPSC), 2025, and is scheduled to present at AGU, 2025.

Moitra P, Amenah A, Tatsch A, Santra P (2025), Flow- and fracture-driven bubble throat growth rates and dynamic permeability in crystallizing magma, Geochemistry, Geophysics, Geosystems, 26(2): e2024GC011932, doi.org/10.1029/2024GC011932.

Moitra P (2024), Rheological arrest vs. rapid growth of bubbles in crystal-rich magma, Earth and Planetary Science Letters, 646:118984, doi.org/10.1016/j.epsl.2024.118984.

Some Applications of Artificial Intelligence to Geosciences

By Professor Mihai Ducea & Professor Barbara Carrapa

The increasing amount of available scientific data, coupled with the complexity of scientific questions requiring integration of different fields of study, is far exceeding the processing capacity of human readers. This overload impedes our ability to answer complex and relevant scientific questions and make new discoveries. Work by Geosciences professors Barbara Carrapa, Mihai Ducea în collaboration with Prof. Mihai Surdeanu from Computer Sciences published in *GSA Today* in 2021 shows the potential to apply artificial intelligence (AI) to automatically read large volumes of specialized literature and answer simple questions posed by the scientist. That experiment showed the promise but also some serious limitations of reading and interpreting geologic literature via machine learning. The same research team is now planning to continue this effort and apply AI to large datasets to distill numerical data (such as ages and geochemical data). Existing databases have tremendous limitations because data needs to be recorded manually and often following complicated algorithms, hindering our ability to have up-to-date global datasets. [Figure 1] Consequently, all existing chemical/isotopic/geochronologic databases are years out of date, awkwardly constructed and poorly managed perhaps due to lack of proper funding and/or complexity of data. The research team is planning to apply an automated machine reading strategy that can ingest thousands of geoscience papers, read tables containing numerical information, contextualize the extracted data, and aggregate and synthesize the extracted data based on its context. This research, which forms the basis of an NSF proposal currently pending, plans to apply state-of-the-art in artificial intelligence with new algorithms that enhance the large language models capacity to understand text and numerical information. This technology has the potential to dramatically impact the process and pace of conducting scientific research in Geosciences by enabling the rapid and accurate verification of complex hypotheses.

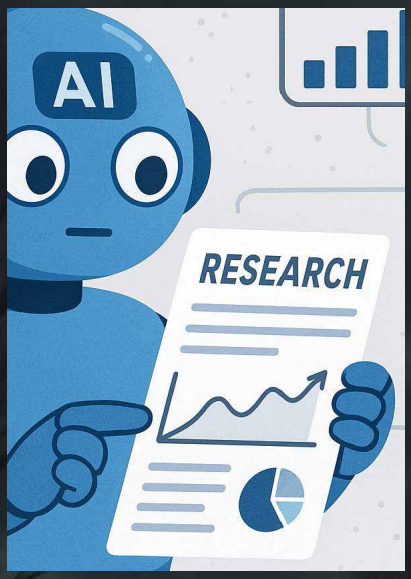


FIGURE 1: ChatGPT-generated image showing the power of AI to distill data from the literature

Update on the Undergraduate Program

From Associate Professor of Practice and Senior Undergraduate Advisor Jess Kapp

The Undergraduate Program is thriving! With close to 200 majors and three degrees to choose from, our students are involved in a diverse array of courses, research, and activities. Our newest degree – BS in Planetary Geosciences – is taking off like a rocket! This spring saw our first two students graduate with this degree, and the number pursuing the degree grows each semester. With emphasis options in Geology, Geophysics, Gem Science, and Climate, our Geosciences BS degree continues to provide hundreds of students with strong scientific training and depth of geologic experiences that will serve them well in the future. Job growth in the geologic sector holds steady, and UA Geosciences students will graduate ready to make an impact in our ever-changing world.

Our club, the Society of Earth Science Students (SESS), is the largest and most active it has been in over a decade. Thanks to great leadership by the club officers, and our students' interest in connecting with each other and the community, they continue to provide outreach around Tucson and build a strong network of support for undergraduates. Here they are on their annual spring break trip to Utah in March 2025.

Advising was shaken with unavoidable and difficult changes in fall 2024, but in January 2025, I stepped in as Senior Undergraduate Advisor, and I am loving the job. With over 20 years of experience in the department focused on teaching undergraduates, I have been able to jump right in and help our students navigate the program. I extend endless thanks to the entire Geosciences staff who have helped me in so many ways, especially Rocina Garcia, the Graduate Program Coordinator, who took over all undergraduate advising in addition to her usual duties until I came on. Rocina has spent countless hours getting me up to speed. We have built a strong advising team and continue to work together to provide high quality advising tailored to our Geosciences students. If you are a Geosciences student, drop by and see one of us for all of your advising needs.

Scholarships & Donations

The Department of Geosciences disbursed over $150,000 in both scholarship and non-scholarship student support over AY24-25 and summer 2025. Below you will find a list of all scholarship and non-scholarship award recipients as well as a highlight of donor support.

Firstly, thank you to Montgomery & Associates for their sponsorship of the Montgomery Associates Best Overall Talk winner and graduate student **Madison Tuohy**. Another thank you to individual donor John Wilder, who sponsors the Nicea Wilder Best Graduate Talk - winner and graduate student **Jim Bradford**.

UNDERGRADUATE PROGRAM

SCHOLARSHIP AWARDS

Kenneth Lovstrom Memorial Scholarship
Alexus Wuertemburg

Geosciences General Scholarship
Kay Poonawala
Jacob Stevens
Bridgett Holman
Angela Tatsch
Julia Zingray

David L. Moore Memorial Scholarship
Alma Reasoner

Winslow-Ruben-Myron Shared Scholarship
Devin Maroney
Danna Nichols Alcala

Evans B. Mayo Scholarship
Alma Reasoner

Zoback Family Scholarship
Kayla Campbell
Katleho Ramotso
Jacob Steven

George H. Davis Research Fund
Ainsley Carling
Mehgan McKenna
Soren Miller
Angela Tatsch
Max Mudgett
Erika Perez

Marie S. Pearthree Scholarship
Alma Reasoner

Chernoff Family Geosciences Field Experience
Nathaniel Hale
Brett Bodine
Alma Reasoner

NON-SCHOLARSHIP AWARDS DISTRIBUTED BY GEOSCIENCES

GeoDaze Winners
Kay Poonawala
Caitlin Salanga
Malath Alyousef

GRADUATE PROGRAM

SCHOLARSHIP AWARDS

Kenneth Lovstrom Memorial Scholarship
Amanda Manoogian

David J. Lowell Graduate Scholarship
Nitzan Yanay
Anca Barla
Guido Merino
Michaela Schnell

John and Nancy Sumner Scholarship
Daniel Alberts
Caden Howlett
Sankha Mahanti
Jim Bradford
Priscilla Martinez
Rebecca Beers
Tumaini Kamulali
Anca Barla
Chance Ronemus
Aniket Dhar
Madison Tuohy
Alexandra O'Keefe
WeiWei Ma
Parker Comisac
Amanda Manoogian

Peter J. Coney Scholarship
Michael Padilla
Luke Basler
Sankha Mahanti

Bert S. Butler Scholarship
Holly Thomas
Mudith Weerabaddanage
Madison Tuohy

Sulzer Earth Science Scholarship
Rebecca Beers
Timaini Kamulali
Michael Padilla
Asiya Badarunnisa Sainudeen
Mudith Weerabaddanage
Alexandra O'Keefe
Corey Crowder

Mark and Mary Lou Zoback Scholarship
Jordan Wang

Spencer R. Titley Grad Fellowship
Isaiah Spring
Pratik Santra
Madison Tuohy

Cranwell Smith Scholarship
Aniket Dhar

Marie S. Pearthree Scholarship
Asiya Badarunnisa Sainudeen
Priscilla Martinez

Kartchner Caverns Scholarship
Amanda Manoogian

Wesley Pierce Graduate Scholarship
William McCraine
WeiWei Ma

Paul E. Damon Scholarship
Anca Barla

Lundin Family Scholarship
Jonothan Chappell

NON-SCHOLARSHIP AWARDS DISTRIBUTED BY GEOSCIENCES

GeoDaze Winners
Asiya Badarunnisa Sainudeen
Sankha Mahanti
Jim Bradford
Isaiah Spring
Lucas Brown
Luke Basler
Alexandra O'Keefe
Joaris Del Mar Hernandez-Morales

GeoDaze Chairs
Caden Howlett
Priscilla Martinez

Upcoming Events

ACADEMIC YEAR 2025-2026

Department of Geosciences Fall 2025 Colloquium Series Starts
Professor Susan Beck
Thursday August 28th, 2025

Department of Geosciences Welcome Back Meet and Greet
August 29, 2025

Geology Society of America (GSA) Connects 2025
San Antonio, Texas
October 19-22, 2025
connects.geosociety.org

Department of Geosciences Winter Potluck
December 2025

American Geophysical Union (AGU) Annual Meeting
New Orleans, Louisiana
December 15-19, 2025
agu.org/annual-meeting

Department of Geosciences Faculty Retreat
January 2026

Department of Geosciences Graduate Admissions Visit
February 2026

Department of Geosciences Annual Advisory Board Meeting
March 25, 2026

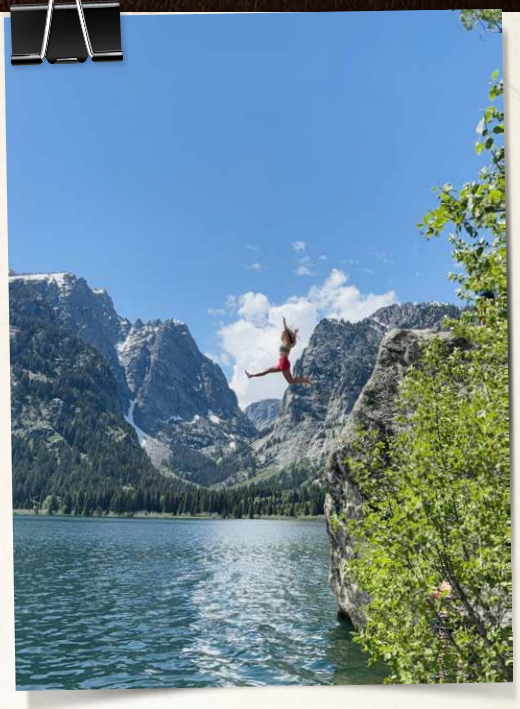
GeoDaze 2026
March 26-27, 2026
geodaze.com

Celebration of Professor Andy Cohen's Life
March 28, 2026

Geosciences Graduates Open House
May 15, 2026

Graduate student Guido Merino field mapping the Diamond Joe pluton in NW Arizona.

Phelp's Lake Jumping Rock in Grand Teton National Park Wyoming. Photo taken of Lindsey Frenia by fellow classmate Aurora Bertoldo. →



From the Field

Hannah Howe, and David Luffman from the 2024 Summer Field Camp. ←

Alma Reasoner and Jacob Stevens in Green River Lakes, WY for field camp (GEOS 414) →

Banana Canyon, central Idaho from ISU geology field camp 2025. This photo shows Raghad Jaddua (University of Arizona) and Landi Morgan (University of Hawaii)

Professor Diane Thompson walking toward the boat with a 70+ lb backpack after a long and exhausting day of fieldwork, collecting lake sediment samples from the remote crater lake on Isla Genovesa — a secluded volcanic island in the Galápagos, known for its dramatic landscapes and unique biodiversity.

In May, Instructors Barbara Carrapa, Jonny Wu and TAs and preceptors Priscilla Martinez, James Aidala, Alma Reasoner and Mitchell Baird led a field trip to the Grand Canyon for Geos 255, Historical Geology. Students had the opportunity to camp out at the south rim of the Grand Canyon and hike all the way down to Havasupai Gardens and explore ~2 million years of geological history. From supercontinent assembly and break up to orogeneses, sea level change and paleoenvironments, Laramide tectonics and Grand Canyon incision. An incredible hands-on geological tour de force and one of the many unforgettable experiences we offer to our undergraduate students.

Profs. Barbara Carrapa and Peter DeCelles, together with collaborators (Brian Horton, UT Austin; Brian Hampton, New Mexico State; Robert Gillis, Alvaro Rodrigo Iriarte Ibañez and Rodrigo Fernandez, Universidad Major de San Andres in La Paz) and with logistical help from Dr. Amanda Calle and drivers Lucio and Alcides, conducted fieldwork in Bolivia to collect samples from the Eastern Cordillera and Altiplano for thermochronology and geochronology with the goal to resolve the tectonic history of the Central Andes and understand along strike variations in fold and thrust belt and foreland basin development. This study is part of a larger and multi-disciplinary NSF funded project (TANGO: TransAndean Great Orogeny) to understand subduction and the relationships between deep scale processes and the surface in shaping Cordillera type orogenic systems.

GEOS 255 Historical Geology field trip to the Grand Canyon. "It was my first time there. It's crazy! Like your eyes cannot hold that much," shared graduate student Guido Merino.

Volcanology PhD student Madison Tuohy doing field work in Iceland.

Associate Professor of Practice Amanda Hughes along with TAs Parker Comisac and Will McCraine led students from GEOS 304, Introduction to Structural Geology, through the Arrastre Wash, Tanque Verde Falls, and Pyeatt Ranch, to map and observe brittle and ductile deformation fabrics, folds, and faults in both extensional and contractional settings.

Between a Rock and a Field Place

The 2025 rendition of GEOS Summer Fieldcamp was another successful experience. 15 students were accompanied by faculty members Paul Kapp, Barbara Carrapa and Peter DeCelles, TAs Luke Basler and Priscilla Martinez, guest faculty Wang Xin, and cook extraordinaire Parker Comisac (who doubles as a graduate student). Students this year came from the University of Arizona, Middlebury, Lamar University, Dennison, Bucknell, Grand Valley State, Syracuse University, and Lanzhou University (China).
The group traveled from Tucson to southern Utah, Wyoming, and Nevada, studying the development and history of the North American Cordillera from the Archean to present. Our purpose is to develop an integrated understanding of orogenic processes from outcrop to mantle scale. We camped in gorgeous wilderness settings, had wonderful weather, and outran the forest fires. In the words of one student:

See more photos at the bottom of page 26.

"I can't express how awesome of an opportunity this was, ...[it] helped me grow as a geologist in a number of ways".

Updates on the Lowell Program in Economic Geology

From Professor Mark Barton

In the Lowell Program in Economic Geology, the last academic year has seen many new students, new offerings, expanded labs, successful short courses, and staff changes. Building on major support from Freeport and several large grants, student numbers have increased by 9 to 19 masters (9 PSM, 5 MS) and doctoral (5) candidates. This year five have graduated and 3 new students join us this fall.

An overview of the district and eastern Nevada. Eric Seedorff led the Robinson district (Ely, NV) day of ore deposit mapping course.

Principally through the efforts of Dr. Marta Codeço (now Asst. Prof. of Practice) we have a graduate certificate in Mineral Resource Geology aimed at short course participants and others who would like U of A course credit, and perhaps apply those credits in the long run toward a degree. Marta also led the creation of an accelerated masters program in economic geology which will allow our undergraduates to combine their BS and MS degrees in a 5 year program aimed at industry jobs. Later this summer, Dr. Jason (JD) Mizer (PSM 2013, PhD 2017) will return to LPEG to fill Marta's former role as Program Manager. Among other things, JD will help us rebuild LPEG's technical and alumni advisory group. We are hopeful that we can fill both the Lowell and Lundin Chairs with experienced people this coming academic year.

In addition, we've improved other courses and facilities. Dr. Dean Riley (MGE) added a new short course on hyperspectral applications to mining to our existing 10-day short courses (ore deposit mapping, porphyry-IOCG-alkaline, structure for mining and exploration). These courses continue to be well subscribed; their income is critical in supporting our program. Emeritus Professor Eric Seedorff continues to play a key role in all three courses.

In a handoff from Isabel Barton, Marta has taken on coordinating the 3 "Inputs to Integrated Mine Planning" (geological, mining engineering, metallurgical) and is converting them to fully online with lectures from industry and U of A experts. In collaboration with others, Dr. Frank Mazdab has developed his modular graduate courses in mineralogy, petrology and geochemistry for resource geology. They provide basic background/review that most incoming students need. Frank's classes and a new ore microscopy class (led by Marta and Hervé) use our new ore microscopy lab. The interdisciplinary Lowell Mineral Characterization facility combines multiple labs with expanded LA-ICPMS, spectroscopy, and other tools to support a plethora of minerals-related projects.◆

Alumni News

In January, this group of U of A Geoscience graduates met at the Exploration Roundup conference in Vancouver to talk shop and recount old times. These amazing alumni all have important positions in the mining and exploration industry, governments and universities. Such a great example of the careers that U of A has had an integral part in launching!

Front Row L to R: *Brooke Clements (MSc 91), John-Mark Staude (PhD 95), William McLelland (PhD 90), Lance Miller (PhD 94), Jennifer Roskowski (MSc 07), Tom McCandless (PhD 94), James Lang (PhD 91)*
Back Row L to R: *Wolfram Schuh (PhD 93), Doug Kreiner (PhD 11), Eric Jensen (PhD 03), David Johnson (PhD 00), Stephen Enders (PhD 00), Matthew Gray (MSc 88), Doug Silver (MSc 80), David Maher (PhD 08), Kate Gregory (PhD 92), Roy Grieg (PhD 21), Wojtek Wodzicki (PhD 95), David Lajack (94-96)*

Stacey Gibbons, member of the Geosciences Advisory Board, was awarded this year's GeoDaze Outstanding Alumni Award.

Kathleen "Kleo" Pullin (BS 2014) is working as a lab technician and electron microscopist at a startup, USA Rare Earth, Inc. (Nasdaq: USAR), helping to build an analytical lab in the magnet factory in Stillwater, Oklahoma. "It's a great company and challenging work, with a long future," Kathleen shared, "I also have a certificate in materials electron microscopy and a strong interest in developing new sample preparation methods for materials. I've used my geosciences education for this, as geological materials are more complex than metals when imaging and characterizing in electron microscopes." This work was also featured in the Oklahoma news.

Since graduating in 2013, **Artie Wickham** has completed a Masters in Hydrologic Science and Engineering from Colorado School of Mines, married and started a family (my wife is also a UA Geosciences alumni, 2013) and has been applying their degree as a contaminant hydrogeologist offering environmental site assessment and remediation consulting services, most recently specializing in emerging contaminants (PFAS) investigations at Department of Defense installations nationwide. Of note, as a Project Manager at BEM Systems, Inc., I led a team that recently completed the nation's first PFAS Remedial Investigation and Human Health and Ecological Risk Assessments for the US Air Force. These investigations set procedural and technical precedent industry-wide and are critical to the Government's mission to protect human health and the environment from PFAS 'forever chemicals'. The project also won a Project Merit award from the Environmental Business Journal (EBJ).

Aryn K. Hoge (M.S. 2014) has been fortunate to spend the last ten years working in mineral exploration and mining, which has taken her to amazing places such as 8700' below ground in Colorado's front range, south central Louisiana's salt domes, the lesser Caucasus in Georgia, Nevada's high country, and Guyana's rainforest (among many, many others). After two years of greenfields gold exploration in the Guiana Shield she now works as a member of Barrick Mining's North American business development team and is responsible for technical evaluation of third-party copper and gold opportunities in the US and Canada. Inexplicably, she lives on Alabama's gulf coast...where there are no rocks at all (but where the fishing, kayaking, birding, and eating are top-notch).

In Memoriam

Dr. Andrew Scott Cohen (1954-2025)

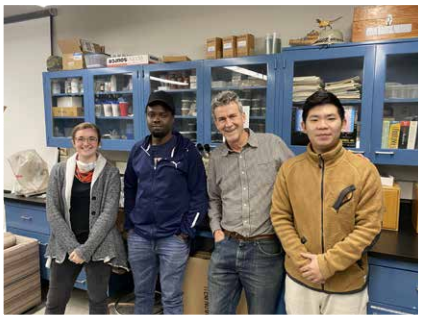
See the full memorial webpage, including more photos, and learn more about the "Andy Cohen Memorial Fund for Broadening Access in Geosciences" at geo.arizona.edu/andy-cohen-memorial.

It is with a heavy heart that we report that Andrew S. Cohen passed away in Tucson on February 5, 2025 at the age of 70, surrounded by his family—wife Debbie, sons Alexander and Zachary, and his brother Steve.

Andy earned his B.S. in 1976 at Middlebury College, where he first learned about lakes, and his Ph.D. at UC Davis in 1982 doing ground-breaking work on Lake Turkana in East Africa. His initial publications included the seminal Cohen et al. (1983) Lacustrine Paleochemical Interpretations Based on Ostracodes, Paleogeog., Paleoclim., Paleoecol. 43: 129-151. He spent the rest of his career focusing on paleoenvironments of the East African rift.

Andy's first academic job was as an Assistant Professor at Colorado College (1982-1986). He left to join the faculty at UA, where he spent the next 39 years as a Distinguished Professor in Geosciences, with a joint appointment in Ecology and Evolutionary Biology. At UA, he advised 14 PhD, 11 MS, and numerous undergraduate students. He was recognized as a UA Galileo Circle Fellow, AGU Fellow, GSA Fellow, as well as with the International Limnogeology Association Wilmot Bradley Medal, the GSA Limnogeology Division Israel Russell Award, and the UA Foundation Leicester and Kathryn Sherrill Award for Creative Teaching. Andy published >185 papers (~14,00 citations and h-index of 61), and a seminal book on Paleolimnology. History and Evolution of Lake Systems, as well as numerous white papers on continental drilling, human evolution, and biodiversity in Lake Tanganyika.

Andy was a cornerstone in the development of scientific lake drilling and the discipline's most vocal champion. He led three major drilling projects: GLAD at Great Salt Lake, Lake Malawi, and the Hominin Sites and Paleolakes in Africa. Through those projects, he coordinated and trained hundreds of scientists, influencing the careers and lives of many and bringing together researchers from multiple disciplines and countries.



Andy and his lab students in the paleolimnology lab.

Andy was awarded 25 US NSF research grants. In 1997, his Research Experience for Undergraduates award led to the creation of the Nyanza Project on Lake Tanganyika, which initiated a decade-long training program of over 100 students from both the U.S. and Africa, many of whom have gone on to make significant contributions to limnological and paleolimnological research.

Andy's work in Africa and around the world has been fundamental to advancing understanding of the interactions among climate, ecosystems, and humans. He was a leader in lake management and conservation. Even in 2024, while battling cancer, Andy continued to work diligently, with his latest research focusing on circulation in Lake Tanganyika and how a warming world might affect this vital food source for millions of Africans. He worked indefatigably to advance projects still in the mill, and ensure his samples were curated in a manner to enable others to continue the work.

Andy was a Renaissance scientist and enjoyed applying his insights to various geological and ecological problems, from ancient lake systems in South America to the Bouse Formation of the American Southwest. He explored fossil tracks in Tanzania, mercury contamination in modern lakes, and experimental studies on fossil preservation under acid rain scenarios. Andy's curiosity knew no continental bounds. His scholarship reflected a rare breadth, bridging paleolimnology, tectonics, conservation biology, and human evolution, always with an eye toward how ancient records speak to modern planetary change.

Andy, Pete Decelles, and Barbara Carrapa skiing at Sunrise in the White Mountains of northern AZ.

Beyond his research, Andy was an affable, generous, and committed mentor, devoted to fostering the next generation of geoscientists—especially those from underrepresented

Photos shared by Associate Professor Kaustubh Thirumulai who worked closely with Andy throughout the years

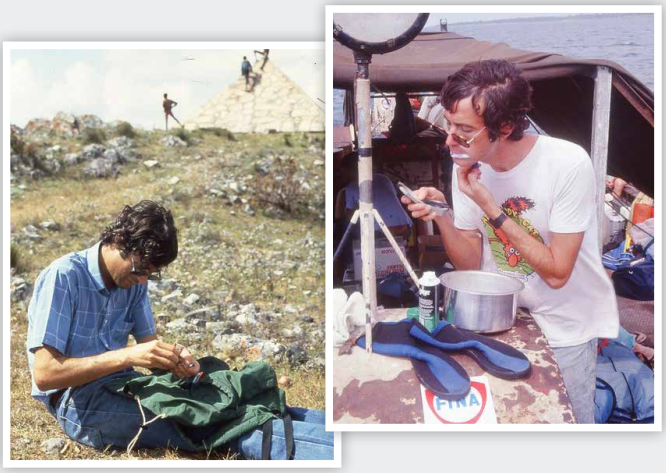
backgrounds. He was proud of leading the aforementioned Nyanza Project. Later in his career, he channeled the same vision into the NSF-funded Clouds to Core (C2C) project that brought community and tribal college students from across Arizona into cutting-edge geoscience research. Whether in the field, lab, or classroom, Andy believed science belonged to everyone. His legacy is not only in the hundreds of papers and paleoclimate reconstructions he leaves behind, but also in the curiosity he kindled and the doors he opened for so many.

Andy was a trailblazer, visionary, and dedicated leader whose legacy will inspire us for years to come. A keen observer of the natural world with an insatiable curiosity, he was a true scientist's scientist—conducting himself with integrity while always sharing a good dose of laughter. He had several species named in his honor: an ostracode Gomphocythere coheni (Park and Martens, 2001) and a diatom Lindavia cohenii (Mohan et al., 2016), with several ostracodes and gastropods on their way. His students, mentees, colleagues, and friends from around the world sadly mourn his loss.

Respectfully Submitted,
Lisa Park Boush (U of A PhD - 1995)
Michael McGlue (U of A PhD - 2011)
Kaustubh Thirumalai (U of A colleague since 2019)

Andy along with Professor Jay Quade at the highest exposure of the Bidhochi Formation, in a remote area of the Navajo Nation on Balakai Mesa. "Andy saw this old sedan backseat that someone put out there a long time ago to enjoy the rising sun. Without blinking an eye, he grabbed Jay and they both sat on this old nasty chair and asked me to take their picture, so great!" - Paradise Valley Community College Professor of Geography John Douglass, who knew Andy for a couple of years.

Champagne bottles in the Paleolimnology Lab commemorated by committees of Andy's past graduate students' graduations



Shared by one of Andy's previous students, Kelly West. Andy shaving using the mirror in his Brunton compass onboard a research vessel. Andy at the Source du Nil in Burundi, Africa.

Wes Bilodeau – 1948-2025 *B.S. in Geology 1971*

Wes became a Research Specialist for Geosciences the same year he graduated. He managed the Geology Department's field and laboratory equipment to support undergraduate field camp training and graduate program field studies. He was especially interested in clay mineralogy and was proud of his contributions to research on buckyballs at the UA. He retired on September 17, 2005, with a joyful celebration attended by staff, students, his neighbors, and former students. For more information visit after.com/obituaries/wesley-keith-bilodeau.

Recent Graduate Degree Recipients

MASTER'S DEGREES *Fall/Winter 2024 - Summer 2025*

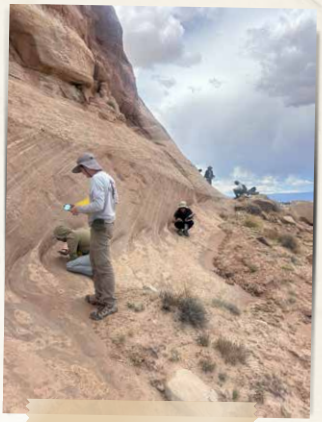
Name	Title	Advisor	Employer	Position
Elijah Mullins	Peralkaline Sodic Metasomatism from the Wilson Ridge Pluton, Northwestern Arizona.	Mark Barton	Haile Gold Mine - OceanGold Corp	Geologist I
Rebecca Fulton	Effect of melt-domain size on the stability of vapor films: Implications for explosive submarine volcanic eruptions.	Pranabendu Moitra	Unknown	Unknown
Alexandra O'Keefe	Calibrating Benthic Individual Foraminifera Analyses (BIFA): Bottom Water Variability or Bioturbation Proxy	Victor Baker	University of Arizona Geosciences	PhD Candidate
Jonothan Chappell	Integrating Geochronology and Ore Mineralogy Constraints to Correlate the Formation of the Diamond Joe Pluton and Big Sandy Porphyry Copper Prospect, NW Arizona, USA	Herve Rezeau	Tamarack Geological Services	Junior Exploration Geologist

PROFESSIONAL SCIENCE MASTER'S *Summer 2025*

Name	Title	Advisor	Employer	Position
Jennifer Weiss		Mark Barton		
Madeline Murtaugh		Mark Barton		
Eyn Phillips		Mark Barton		

More photos from GEOS Summer Fieldcamp

(See "Between a Rock and a Field Place" story on page 22).



DOCTORAL DEGREES *Fall/Winter 2024 - Summer 2025*

Name	Title	Advisor	Employer	Position
Moloud Rahimzadeh	Machine learning and plate tectonic analysis for mantle heterogeneity, paleo-climate, and citical minerals	Jonny Wu	Unknown	Unknown
Tshering Lama Sherpa	Magnitude, architecture, timing and rate of regional deformation and metamor-phism in the Himalayan thrust belt of Nepal	Peter DeCelles	University of Washington	Postdoctoral Scholar
Brandon Levenstein	K-AR Geochronology of Authigenic Clays to Date Paleoweathering	Jay Quade	University of Arizona	Research Professional
Nitzan Yanay	Applications of Carbonate Geochemistry to Orogenic Systems: Examples from the Himalaya and the Hinterland of the North American Cordillera	Jay Quade	Brooks Applied Labs	Research Chemist
Nathan Abramson	Integrating Erosion Model Predictions into Mine Rehabilitation: A Data-Driven Approach to Predicting Rill and Gully Erosion at the Landform Scale	Jon Pelletier	Unknown	Unknown
Guillermo Gastelum-Morales	Insights into the Magmatic and Metallo-genic Evolution of North-Central Mexico from Geochemistry and Geochronology of the Fresnillo, San Julian, and Orisyvo Precious-Metal Districts	Joaquin Ruiz	Fresno PLC	VP Exploration
Jordan Wang	Structural Geology and Geochronology of Cordilleran Forearc Assemblages, Baja California and British Columbia	Paul Kapp	UCLA	PostDoctoral Scholar
Caden Howlett	Behavior of Hybrid Thick-and Thin-Skinned Orogenic Wedges in the Western Interior USA and South-Central Andes	Barbara Carrapa	Utah State University	Postdoctoral Fellow
Chance Ronemus	Cretaceous to Cenozoic evolution of the Southern Central Andes and basins rein”	Peter DeCelles	Idaho State University	PostDoctoral Scholar
Anna Rebaza Morillo		Ananya Mallik		

THE UNIVERSITY OF ARIZONA
COLLEGE OF SCIENCE
Geosciences

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Join Leading Geoscientists on Campus & Online – UA Colloquium Series 2025

This year's colloquium series will consist of a mixture of researchers across the University of Arizona as well as visiting scientists! The colloquium series will kick off on **Thursday, August 28th, 2025**.

Visit geo.arizona.edu/colloquium for the most up-to-date details.