



GEOLOGICAL SCIENCES  
UNIVERSITY OF COLORADO BOULDER

# Geology News

Members of the Alps field course observe  
Triassic limestone beneath Chenaillet, May 2024

Editors:  
Anne Sheehan  
Dan Mitchell

2024 - 2025



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# Letter from the Chair

Anne Sheehan

As I conclude my first year as Department Chair, I am grateful to past Chair Bob Anderson for his leadership and to the department staff and colleagues for ensuring a seamless transition. I also want to extend my appreciation to our dedicated faculty, staff, and alumni, as well as to our incredible students and researchers, whose enthusiasm and hard work inspire me daily.

We were delighted to welcome new Assistant Professor Kathryn Materna to the faculty in January 2024. Kathryn is a tectonic geodesist who brings expertise in interferometric synthetic aperture radar (InSAR), global navigation satellite systems (GNSS), and other geophysical tools to our program.

Our department remains highly ranked, and our faculty, staff, and students have garnered recent awards. A few highlights from the past year: Professor Shemin Ge was bestowed with the honor of University Distinguished Professorship, CU's highest honor given to faculty. Professor Karen Chin received the Geological Society of America Randolph and Cecile Bromery Award, and Rebecca Flowers was named a fellow of the Geological Society of America. Graduate Program Administrator Kara Bajdas received the prestigious CU Staff Council "Staff Excellence Award" in October 2023. Student awards include a National Science Foundation Graduate Research Fellowship to Connor Antonio Diaz, the van Ek Scholar Award to Simon Bantugan, and the Neal J. Harr Rocky Mountain Association of Geologists Award to Sydney Ciechanowicz.

Several faculty members successfully went through promotion steps this past year. Lizzy Trower and Sebastian Kopf were both promoted to Associate Professor with Tenure. Lizzy Trower is a sedimentologist, and her research combines insights from geomicrobiology, geochemistry, and geomorphology. She investigates how ancient Earth ecosystems responded and how modern systems react to environmental change. Her interdisciplinary approach includes numerical modeling, lab experiments, fieldwork, and applications to rock record interpretation. Sebastian Kopf combines biology, chemistry, and geosciences to better understand the role of microorganisms in modern Earth systems and throughout Earth's long history. His work has provided important constraints on soil metabolisms, and he has developed new ways to harness geomicrobiology to extract information on past environments. Assistant Professor Alisha Clark (planetary materials science) successfully

completed her pre-tenure comprehensive review and reappointment. Alisha studies the physical properties of materials that make up the interiors of planets by conducting experiments at high pressures. Dr. Aaron Bell (petrology) was promoted from Research Associate to Assistant Research Professor. The Research Professor Track is designed for those who have a strong record of generating independent research funding, conducting research, and contributing to the educational mission of the department.

After a distinguished career of 34 years at CU Boulder, Prof. Paul Weimer was promoted to Professor Emeritus in January 2024. Paul, who served as the Bruce Benson Endowed Chair followed by the Paul M. Rady Endowed Chair in Geological Sciences, made important contributions over his career to the understanding of petroleum systems of deep-water continental margin systems and developed innovative educational animations in geology.

We were saddened by the loss of Emeritus Professor Bill Bradley in 2023 and Emeritus Professor Ed Larson in 2024. I was lucky enough to co-teach undergraduate geophysics and tectonics with Ed Larson in the 1990s and benefited from his guidance and advice as I was starting out at CU. Just last summer, in June 2023, several of us joined Bill Bradley for lunch with current and former chairs of the department.

Community-building events flourished in the department this past year. Our weekly coffee hours and post-colloquium socials have provided a relaxed environment for students, faculty, and researchers to connect and catch up. New events this year included a "Night at the Museum" for department members and their families, an "Earth Mysteries and Histories" outreach event for the Boulder community, and a first-ever (we think) department spring formal and awards ceremony. The Geology Club and the Geological Sciences Graduate Association were very active this year, with events including field trips, camping, a bowling night, and a retreat. The Geology Advisory Board is also flourishing and provides valuable professional connections to our students.

Field offerings continue to be a central part of our curriculum. The department offered an international field course in the Galapagos (Summer 2023), a course in the French Alps (May 2024), and a field class in Hawaii (Fall 2024). Additional field courses explored the Rio Grande Rift in New Mexico, snow hydrology in Crested Butte, geophysics and geohydrology in the Colorado Front Range, and, of course, many excursions to Six Mile Fold north of Boulder.



In closing, I extend heartfelt thanks to our alumni and donors. In my first year of chair, I have witnessed the profound positive impact that our alumni and donors can have on our program. Donations enable us to provide student scholarships, travel awards, research funds, and support for geologic field trips. We hope to see many of you at our department reception during the AGU meeting in Washington DC in December 2024 and at other activities throughout the year. We are always eager to hear from you, so please stay in touch!



Department Chair Anne Sheehan (lower left) at Empire, Colorado GNSS site with Assistant Professor Kathryn Materna and RECESS undergraduate interns James Genero and Louisa Kaplan.

**Brett Bertok** joined the department staff as Undergraduate Program Administrator in May 2024 and is quickly getting up to speed on course scheduling, vehicle reservations, and the many administrative tasks associated with the undergraduate program. Anne Marie Summers, Marilyn Bender, and Kara Bajdas round out the front office team who provide support for the department.

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Benson Earth Sciences Building, Summer, 2024



New Geological Sciences Undergraduate Program Administrator Brett Bertok





# Greetings from the Alumni Advisory Board

by Penny Patterson

Greetings from the Department of Geological Sciences Advisory Board. It has been my pleasure to serve as Chair of the Advisory Board over the last year, a year filled with many exciting events and changes. In June, Dr. Bob Anderson stepped down as Chair of the Department. The Advisory Board extends our sincere thanks to Bob for his service and dedication in guiding the Department through the many trials and tribulations that arose during his tenure. Despite the challenges, the Department flourished under Bob's leadership and continued to be ranked highly in the world in geosciences. In July, Dr. Anne Sheehan took over the reins as Department Chair. Within her first month of taking on her new role, Anne and I met to discuss the Advisory Board and its mission to strengthen bonds between the Department, alumni, friends, and the geoscience community, and to guide and assist the Department with curriculum and academic excellence. Anne is fully engaged with the Advisory Board and embraces its contributions to the Department. We look forward to working with Anne and supporting her leadership and goals for the Department.

Another exciting event for the Geology Department was the November 2023 announcement of Dr. Shemin Ge being named a University of Colorado Distinguished Professor. This revered title is the highest honor awarded to tenured faculty members across the four CU campuses and recognizes professors who demonstrate excellence in research and education, as well as excellence in service to the university. Shemin is recognized for her research as a hydrogeologist focusing on groundwater flow interactions, hydrogeologic response to subsurface fluid injections, and basin-scale hydrogeology. The Advisory Board extends our whole-hearted congratulations to Shemin on this well-deserved title.

We have had several changes in the Advisory Board and Emeritus Advisory Board. This past year, Advisory Board members Shannon O'Dunn, Charlie Wilson, and Tim Farnham elected to rotate off the Board.

We sincerely appreciate their valuable service and contributions to the Board and the Department during their tenure. In addition, Patricia Corbetta elected to rotate off the Advisory Board and join the Emeritus Board with current Emeritus Members Dawn Kaback and Houston Kempton. The Advisory Board continues to benefit from the Emeritus Board Member's insights and energies.

At the Fall 2023 semester Board meeting, we welcomed two new Board Members; Jacob Bauer (B.A. 2005) and Mason Dykstra (MS 1999). Jacob is a hydrogeologist and Project Manager at LRE Water in Denver, Colorado. His work focuses on groundwater modeling and analyses, assessment of water rights applications, and optimization of hydrogeological problems. Mason is a co-founder and Chief Technology Officer of MinersAI, which is a new start-up company that focuses on geological data platforms for mineral exploration. Mason began his career as a geologist in the oil and gas industry and throughout his career, he has held a variety of positions including those in research, academia, software development, and mineral resources. At the Spring 2024 semester Board meeting, we welcomed Clara Chew (PhD 2015) and Mario Guzman (B.A. 2012). Clara is a Senior Scientist at Muon Space, where she is currently working on the development of next-generation remote sensing products to better understand the hydrologic cycle. Mario is an Economic Geologist at the U.S. Geological Survey's Geology, Geophysics, and Geochemistry Science Center in Denver, Colorado. His current research focuses on understanding the ore-forming processes of critical minerals within porphyry and epithermal deposits. In summary, the Advisory Board continues to maintain a balance in diversity of careers, diversity of earth science studies, and diversity of experience.

In April the Advisory Board held a Career Night event for geology department undergraduate and graduate students. Advisory Board Member Joe Zamudio took the lead again this year and did an

## Geological Sciences Advisory Board Members

**Eric Anderson**  
USGS

**Jacob Bauer**  
LRE Water

**Lisa Campbell**  
Anschutz Exploration Company

**Clara Chew**  
Muon Space

**Mason Dykstra**  
MinersAI

**Mario Guzman**  
USGS

**Michael Leibovitz**  
Caerus Oil and Gas LLC

**Harold Miller**  
Subsurface Consultants & Associates, LLC

**Connor Newman**  
USGS

**Penny Patterson - Chair**  
Retired, ExxonMobil Exploration Company

**Nadine Reitman**  
USGS

**Sean Sundermann**  
Kilduff Underground Engineering

**Joe Zamudio**  
Mineral exploration and remote sensing consultant



outstanding job organizing the event and promoting informative discussions. Emeritus Board Member Houston Kempton compiled information on new career pathways in earth sciences, which fostered excellent discussions on the various career path opportunities. Career Night was enormously successful and the Department is in the process of incorporating the new career paths information on the website for students to review as they plan their curriculum.

The website for the geology department contains a wealth of information including overviews of the many research programs in the Department as well as links to recent faculty publications. I highly recommend visiting the website; the address is <http://www.colorado.edu/geologicalsciences/>.

In closing, I am sad to say that we lost three dear friends of the Department. Sue Birkeland, beloved wife of Professor Emeritus Pete Birkeland, passed away in July 2023. Pete and Sue were an amazing and loving couple skiing, biking, and traveling the world together. Professor Emeritus Bill Bradley passed away in September 2023. Bill was an outstanding teacher, mentor, and inspirational leader to many of us. Professor Emeritus Ed Larson passed away in March 2024. Ed was an exceptional teacher and a compassionate scientist working to unravel geoscience enigmas rather than follow the current paradigms. They are dearly missed.

Sincerely,  
Penny Patterson

## New Faculty

### Kathryn Materna: Exploring the Subtle Movements of the Earth Using Geodesy

by Halina Dingo

One week after Prof. Kathryn Materna started her PhD in Earth and Planetary Science at the University of California, Berkeley, the 2014 Napa earthquake struck Northern California. This magnitude 6.0 earthquake was the largest earthquake in the San Francisco Bay Area since the 1989 Loma Prieta earthquake. Promptly switching to response mode, Materna and her lab went into the field to set up GPS stations, allowing her to immediately gather data on ground displacements resulting from the earthquake.

Even though the shaking from the earthquake only lasted 10-20 seconds, Materna knew that displacements from the earthquake would continue for weeks or months afterward in processes imperceptible to humans. Though your body cannot perceive it, the whole world is constantly shifting and changing. Tectonic plates pull apart and collide together, magma and fluids rise, and the ground is ever-moving, eroding, and shifting. Geodesists measure the shape and area of the Earth and how it changes over time with these processes. Kathryn Materna, an expert in geodesy and newly appointed assistant professor in CU Boulder's Department of Geological Sciences, and CIRES has dedicated her career to studying these processes.

One process that Materna studies is called aseismic slip. "During aseismic slip," said Materna, "two tectonic plates are slowly displaced across a fault. This process happens without measurable earthquakes, but it can still impact infrastructure that crosses the fault. It can take place after an earthquake in the form of an after-slip. It can take place in geothermal areas, and it's thought to be part of the process of triggering more earthquakes. I use the tools of GPS and satellite radar to study ground movements related to aseismic slip."

Prof. Materna has always been fascinated by the world around her. As a child, she grew up in New Jersey where the rich natural landscapes around her

Materna next to a geodetic survey benchmark in California. These markers are used for topographic and GPS surveys.





inspired her to work in Earth science. During trips to the Delaware Water Gap, Pine Barrens, and summer camps, she cultivated an appreciation of and curiosity about the natural world.

In middle school, an Earth science teacher gave Materna the book “The Control of Nature” by John McPhee, which exposed her to geophysics and its applications. “The book had a section on debris flows and landslides in Southern California and a section on flood control in the Atchafalaya and Mississippi River basins,” said Materna.

“The third chapter was about Iceland, where engineers were building levees to prevent lava from flowing into towns. Interestingly, in early 2024 the geothermal field that I now study in Iceland experienced four volcanic eruptions where levees had been built to control lava flows and protect a fishing village. I still remember the impact that book had on me. I was fascinated by the applications of geophysics and understanding the natural hazards that we face.”

Materna attended the Massachusetts Institute of Technology and earned her B.S. degree in Earth, Atmospheric, and Planetary Science. In 2019, she earned her PhD in Earth and Planetary Science from the University of California Berkeley.

After graduate school, Materna became a

postdoctoral researcher with the U.S. Geological Survey (USGS), where she studied induced seismicity and aseismic slip in geothermal settings. She focused her research on the Salton Sea, a small body of water in Southern California that is close to an area rich in geothermal energy resources.

“It’s sort of a playground for geophysicists,” said Materna, “There are swarms of natural and induced earthquakes that take place in the same domains as geothermal fluid injection and production. My work involves trying to determine the relationship between fluid injection/production and seismicity.”

At CU, Materna hopes to expand her research areas and seek to answer the many scientific questions that interest her. She is excited to bring in new graduate students and become a mentor to new scientists. During the Spring semester, Materna co-taught an undergraduate geophysics class and enjoyed working with other geodesy researchers to explore new and exciting research questions.

“It’s really important to have a group of people that support you in your workplace,” said Materna. “In terms of geodesy, CU is a special place to be. Here at CU, we have quite a few researchers doing this type of work right now. It is exciting to join a community of great people to work with, learn from, and bounce ideas off of.”

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## Department Activities, Research & Lab Reports

### Leilani Arthurs - GRASCE LAB

AY 2023-2024 was an eventful time for the GRASCE Lab. In fall 2023, we welcomed the arrival of our newest member, Stephanie Plaza Torres. As Project Assistant, Stephanie worked closely with PI Leilani Arthurs on two NSF-funded projects (COURAGE and PRIMERS). Among other things, they coordinated the department’s inaugural “Earth Mysteries and Histories” outreach event in April and hosted the “Active Learning Symposium” in May. The former was made possible with the dedication of over 60 volunteers and attracted over 140 visitors from surrounding local communities; the latter brought together about 40 instructors of undergraduate STEM courses at three institutions (CU Boulder, Front Range Community College, and the University of Texas - Rio Grande Valley) to recognize and celebrate their implementation of active learning strategies in their teaching. This year, Holly Fortener continued her research under the PRIMERS project, successfully advanced another year toward earning her PhD, and completed her first experience serving as a Teaching Assistant. The academic year, for the GRASCE

Lab, culminated with Collette Wilfong’s attainment of a PhD, her graduation, and her acceptance of a postdoctoral position at Weber State University!



Collette Wilfong and Leilani Arthurs celebrate at the departmental Spring graduation ceremony.



## Shemin Ge

The hydrogeology research continues the pursuits along two fronts: climate change impact on water resources and water-induced seismicity. MS student Corrine Liu joined the research in the fall to initiate an NSF-funded project that examines glacier melt recharge to groundwater. Two undergraduate mentees graduated in the spring: Nick Ayres and Andrew Carter. Both Nick and Andrew will be presenting their results at the 2024 GSA annual meeting.

Nick's honors thesis was about groundwater level inferred stream baseflow, using the Roaring Fork River in southwestern Colorado as an example. Baseflow is a proxy for groundwater discharge to streams. Nick's work focused on the question of how important the role of groundwater in sustaining streamflow. He gathered and analyzed hundreds of groundwater level data in the Roaring Fork watershed and zoomed in on a subset of data from more than 150 shallower wells to elucidate the hydraulic gradients near the Roaring Fork River. Graduate student Corrine Liu worked with Nick to use a complementary graphical baseflow separation method that yielded a similar magnitude of baseflow. Nick's study, for the first time, demonstrates the potential of utilizing existing publicly available groundwater level data to supplement the study of baseflow, a cost-effective method in quantifying baseflow contribution. Nick's work won the best student poster presentation at CU's 2024 Hydrologic Sciences Student Symposium. Corrie also helped guide Nick's research.

Andrew worked with Shemin and Civil Engineering Professor Roseanna Neupauer on the potential impacts of geothermal energy extraction on hot springs. Geothermal energy, a sustainable resource that can supply heat continuously from deep subsurface, is an attractive alternative for future energy. Most existing and promising geothermal resources in the US coexist with hot springs and often in the arid American West. There is little study on whether and how geothermal energy development may impact hot springs. For example, how will geothermal fluid extraction affect hot spring flow rate or temperature? Andrew used groundwater flow modeling to evaluate the potential impacts of geothermal energy production on hot springs at a hypothetical site that is based on the geologic and geothermal settings near a thermal spring in central Colorado. The hot spring at the foothill of a mountain range is modeled as water flows upwards to the land surface from a high permeability fault. One extraction well and one injection well are placed downstream from the fault. Andrew's model results suggest that

to minimize the negative impact of heat extraction on the hot spring, it is best to locate the injection well between the hot spring fault and the extraction well. While the actual impact at a particular site depends on the specific hydrostratigraphy and geothermal conditions at that site, modeling a hypothetical site helps identify well parameters and design features of the geothermal extraction infrastructure that minimize negative impacts on hot springs.



Shemin Ge and Nick Ayres pose for a picture after the Geological Sciences Graduation Ceremony.

Shemin Ge and Andrew Carter at the Geological Sciences Graduation Ceremony.





## Freshwater in the American West by Adele Preusser

Freshwater -- dwindling, finite, and vital. Prof. Shemin Ge is a hydrogeologist who studies many processes affecting freshwater, and groundwater is her specialty. When asked what interested her first in groundwater flows, she said that she just happened to have some outstanding teachers in hydrogeology throughout graduate school. "Groundwater is unique." Prof. Ge says, "Once I was in the field I thought 'Oh, this is wonderful!'" She first studied paleohydrogeology in sedimentary basins and how they often reveal mineral and ore deposits, as well as the migration of oil and gas. Freshwater is an increasingly important and often tense subject, especially in western North America. Prof. Ge likes to study groundwater because it is a socially relevant topic in geologic science.

Growing up in China during the Cultural Revolution, Prof. Ge worked at a brick factory after high school until the government announced that the universities would be opening to the general public again. However, the only way to get into one of these universities was to take a national exam, and only 5% of the people who took the exam received marks good enough to attend college. Prof. Ge passed, and embarked on an impressive career attending undergraduate school in China and then graduate school at the University of British Columbia and John Hopkins University. She is now a full professor at CU and a former chair of the Department of Geological Sciences.

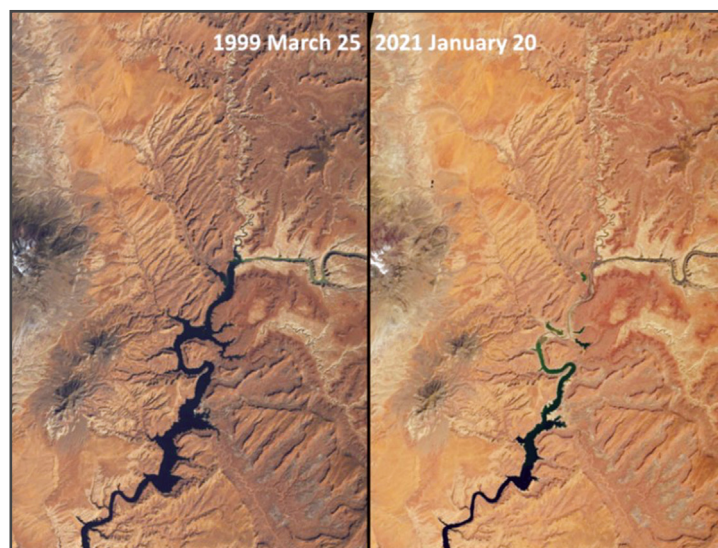
When I met with Prof. Ge, we chatted about her recent article concerning the Colorado River Compact of 1922. The Colorado River Compact was a piece of legislation that has vast impacts on life today. Through the Colorado River Compact, seven states were granted water allocations from the Colorado River that drains a mighty watershed in the Southwestern U.S. In writing the article, Prof. Ge collaborated with people from many backgrounds, including a lawyer, a civil engineer, and a historian, all people with different but important perspectives on what the Colorado River Compact meant and means today.

The Ge et al. article explains that "the terms of the compact...were largely the product of development aspirations and political deal-making, and they relied on optimistic estimations of the amount of water the river could supply that was not supported by existing surveys or science." Today, the Colorado River provides water and hydropower for around 40 million people but reduced precipitation and population growth in the region strain the water resources provided by the Colorado River. The long-term consequences of climate change and flawed hydrogeological information have resulted in lower

than ever reservoir levels during recent droughts in the lower part of the Colorado River Basin. The water in Lake Powell reservoir that provides hydroelectric power came dangerously close to a very low water level in 2022 which would have rendered the dam machinery unusable.

In 2026, the Colorado River Compact will be up for renegotiation. Hopefully, scientists will play a larger role in determining this round of allocations. "It's frustrating sometimes. In general, the policies should be informed by science, but it's usually not the case. Scientists want to stay where they are comfortable, not Capitol Hill to testify," says Prof. Ge.

Another fascinating area of research that Prof. Ge has investigated with former PhD student Claudia Corona and CU Professor Suzanne Anderson is exploring water-table responses to extreme precipitation events. The research team found that these large events lead to water table fluctuation and ultimately result in groundwater going deeper underground. When floodwater is driven deeper, it could become a form of water storage that humans could utilize. One application from this research is to



This comparison of satellite images of the Glen Canyon-Lake Powell region on the Colorado River shows the dramatic change in water level between 1999 and 2021. Credit: Modified from NASA images. From "Fixing the Colorado River Compact" By Shemin Ge, Joann Silverstein, James Eklund, Patricia Limerick and David Stewart. 16 June 2023.

create infrastructure to channel floodwater and reduce flood damage while simultaneously saving water and helping to guard against future droughts.

A better understanding of our freshwater systems can inspire creative ways to use and manage water while we adjust to our changing environment. We depend upon hydrologists like Prof. Ge to decipher how groundwater systems work, and this information can help policymakers make more informed decisions.



# Pamela Stephens: Tiny Marine Superheroes: Benthic Foraminifera in the Modern and Beyond

by Haley Brumberger



Life-long micropaleontologist Professor Pamela Stephens studies modern benthic foraminifera in estuaries to investigate their ecological resilience and understand their long-term evolutionary success.

Professor Pamela Stephens' micropaleontology career started far earlier than most. By the time she was 12 years old, she was spending her summers in the Smithsonian Museum of Natural History picking foraminifera for her father, the late Curator of Foraminifera in the Smithsonian's Department of Paleobiology, Dr. Martin A. Buzas.

Trying not to follow in her father's footsteps, Prof. Stephens went to college to study English. However, her rebellion was short-lived: Prof. Stephens soon found her way back to geology. Today, in addition to pursuing her research, Prof. Stephens is a lecturer in the Department of Geological Sciences, associated with the University of Colorado Museum of Natural History, and serves on the Board of Directors of Cushman Foundation for Foraminiferal Research.

Foraminifera, or "forams" for short, are microscopic (mm- to  $\mu\text{m}$ -scale) protists that are unicellular eukaryotes (organisms with nuclei and other organelles in their cells); you might think of them as "amoebas with shells." They are found living today in most marine environments, from estuaries to the open ocean to the deep sea. Some float in the water column like plankton, but most species are benthic, which means they live in the sediment.

Staples of the environment, benthic forams have helped feed larger organisms since the Cambrian (500+ million years ago). They have made it through all five mass extinction events and continue to flourish

today. In part, this long-term resilience is what drew Prof. Stephens to these "benthic superheroes" in the first place, and studying modern estuarine foraminifera has allowed her to piece together why and how they have been so successful throughout geologic time. This field of research is known as macroevolution and examines how long-term processes of evolution can result in speciation or extinction. Some of her findings, published in a 2018 paper titled "Benthic Superheroes: Living Foraminifera from Three Bays in the Mission-Aransas National Estuarine Research Reserve, USA" suggest that benthic foraminifera can survive in conditions that are inhospitable to other organisms.

Because they are so resilient, forams can also be used for environmental monitoring. Generally, their presence indicates good water circulation, but different species of forams thrive in specific conditions. For example, pyrite incorporated into certain foram tests is a good clue for a low oxygen environment. With food and circulation, forams can survive (and even thrive) in pretty much any environmental conditions—including conditions of low oxygen, high pollution, and even elevated heavy metal concentrations. This resilience is unique: many organisms cannot survive in such conditions, let alone thrive.

So, if you ever come across a marine (or marine-adjacent) environment with no forams to be found? "Something bad happened," Dr. Stephens jokes. "Get out!"

Prof. Pamela Stephens (right) with her father, Dr. Martin A. Buzas (left). Dr. Buzas was awarded the Micropaleontological Society's highest award, the Brady Medal, in 2015. Image source: Pamela Stephens.





## Paul Weimer

Paul's retirement started on 1 January 2024. He finally reached his career peak- i. e. his retirement party at the St Julien on the 18th of November, 2023. It was a memorable, magical evening-- a time when Paul had the opportunity to thank everybody one last time for the ride. Eighty-five people attended-- ~50 % of his graduate students and 10% of research scientists. Most traveled long distances. Shu Jiang traveled the longest distance (7035 miles from Wuhan, China). Mihaela Ryer was second (3246 miles from Hilo), and Jennifer Crews was third (2370 Miles from Anchorage). Paul expresses his deepest thanks and gratitude to everyone who attended.

Paul officially now has a new title – 'recovering academic.'



**@cu\_boulder\_geology** Check us out on Instagram  
[instagram.com/cu\\_boulder\\_geology/](https://www.instagram.com/cu_boulder_geology/)

**SAVE  
THE  
DATE!**

**AGU24**  
Washington, D.C. | 9–13 December 2024

**WHAT'S NEXT FOR  
SCIENCE**

The CU Department of Geological Sciences will host a reception at the Fall 2024 American Geophysical Union meeting in Washington, DC

Tuesday, December 10, 6-8 pm

At

**Clyde's**  
*An American Bar*

Clyde's of Gallery Place  
707 7th Street, NW  
Washington, DC 20001

The reception is open to CU Geological Sciences alumni in the Washington DC area as well as department alumni and current department members attending the AGU meeting.

A group photo at Paul Weimers retirement party.





## Faculty and Staff Awards 2023-2024

**Kara Bajdas**, CU Staff Council  
Staff Excellence Award, 2023

**Karen Chin**, Geological Society of America  
Randolph and Cecile Bromery Award, 2023

**Carolyn Crow**, RIO Faculty Fellow, 2024

**Rebecca Flowers**, Geological Society of  
America Fellow, 2024

**Shemin Ge**, University of Colorado  
Distinguished Professor, 2023  
American Geophysical Union Fellow, 2023

**Thomas Marchitto**, College Scholar Award, 2024

**Karl Mueller**, Arts and Sciences  
Fund for Excellence, 2024

**Lizzy Trower and BAJEDI Committee**,  
Dean's Innovation Fund, 2024

We are thrilled to announce the establishment of the **Lucas J. Kimes Postdoctoral Fellowship in Geological Sciences**, generously funded by the family of Lucas J. Kimes. This prestigious fellowship aims to support early-career researchers in advancing their scholarly pursuits within our department. We believe this fellowship will attract top talent and foster innovative research, further enhancing our department's academic excellence. The inaugural Lucas J. Kimes fellowship was awarded to **Dr. Liannie Velázquez Santana** in the Spring of 2024.



**Karen Chin**  
Geological Society of America (GSA) Randolph and Cecile  
Bromery Award, October 2023

For significant contributions to geological sciences, specifically multidisciplinary paleobiology, as well as opening the geosciences to underrepresented communities through her extensive outreach.



**Kara Bajdas**  
CU Staff Council Staff Excellence Award,  
September 2023

CU staff members – two from each campus and system administration – received the honors, which annually recognize those who go above and beyond their job duties and consistently surpass expectations.

**Shemin Ge** was named a fellow of the American Geophysical Union in 2023 for innovative and societally relevant contributions illuminating the role of fluid flow in basin scale hydrogeology, induced seismicity, and hydrogeologic response to a warming climate. Pictured at left: Shemin Ge with former graduate students Nadine Reitman, Matt Weingarten, and Sarah Evans at the AGU Honors Banquet, Dec 2023.





## In The Field



### Principles of Geophysics

Students in the Principles of Geophysics class GEOL3330 working with seismic and resistivity field equipment on Benson quad. In the students' words: "I thoroughly enjoyed the hands-on experience with different pieces of geophysical equipment" and "I loved the field days". This year, the course was team-taught by new assistant professor Kathryn Materna and associate research professor Vera Schulte-Pelkum.

**Field Course on Geomorphological Methods**, Professor Irina Overeem and TA Abigail Eckland organized a new field class along the Rio Grande River in New Mexico. During Spring break 2024, the class traveled from the headwaters along the incised bedrock gorge to the depositional delta in the Elephant Butte Reservoir. The course taught methods of data collection for geomorphology, with work on debris flow deposits, tributary incision, measuring modern discharge, and depositional stratigraphy.



Describing flood plain stratigraphy on the Rio Grande.  
photo credit: Irina Overeem



Students collecting data near the San Lorenzo tributary to the Rio Grande. photo credit: Irina Overeem



## Galapagos Global Seminar, 2023

Global Seminar: International Field Geology (Guayaquil & the Galapagos Islands, Ecuador) in the summer of 2023. This was a joint course with ESPOL (La Escuela Superior Politécnica del Litoral) in Guayaquil, Ecuador. Professors Lang Farmer and Lon Abbott coordinated this amazing field course.



CU students (Jazmin Schwab, Sarah Leather) performing a field exercise near Puerto Villamil, on Isla Isabela in the Galapagos. photo credit: Lang Farmer

The Galapagos field class conducting field exercises along the mainland Ecuador coast, at Ballenita (Lon Abbott is in the middle of the picture). photo credit: Lang Farmer



## Spring 2024 GEOL 2005 - Earth Materials

taught by Dr. Kevin Mahan and TA Tyler Wickland were fortunate to take a field trip to the Dowe Flats limestone quarry in Lyons, CO owned and operated by Cemex USA. Special thanks to Michael Clausen (left) and Cita Cisse (bottom right) whose vast knowledge of mining and quarry operations led the class down into an active pit to get up close and personal with a rare and unique exposure of the Niobrara Formation!



Michael Clausen talks about land use in Boulder County and the importance of this site in cement production that ultimately supports the infrastructure of the Colorado Front Range community. Dowe Flats seen in the background are mined for the shallow exposures of the Fort Hays Limestone, the lower unit of the late Cretaceous (87-82 Ma) Niobrara Formation.



## Field Tectonics in the French Alps, 2024

This year's GEOL 4719/5719 field tectonics course (8 students and instructor Kevin Mahan) conducted a classic transect across the western Alps in France. From May 13-22, the CU group joined 5 students from Kansas State University (KSU; and 1 instructor, Dr. Brice Lacroix) and 12 French students from the Université de Franche-Comté (UFC; and 2 instructors Drs. Philippe Goncalves and Pierre Trap). The course began with 2 days introduction to the Jura Fold and Thrust belt (type area for the Jurassic period), based out of Besançon, and then moved on to the foothills of the Alps near Grenoble (Chartreuse Mtns) before culminating with several days in the high Alps based out of Briançon (France's highest elevation city). Students learned about thin versus thick-skinned styles of deformation, Jurassic rift basins inverted as Alpine thrust faults, subduction complexes and blueschist-facies metamorphism, obducted ophiolites, and active extensional faulting and seismicity in the Alps. The opportunity for cultural exchange was a huge hit, and it included final oral presentations to the group by teams of American and French students.



This sketch by Kevin Mahan matches the skyline view of Chenaillet ophiolite.



All 30 participants of the GEOL 4719/5719 field tectonics course at Col du L'Isard (famous pass for Tour de France)

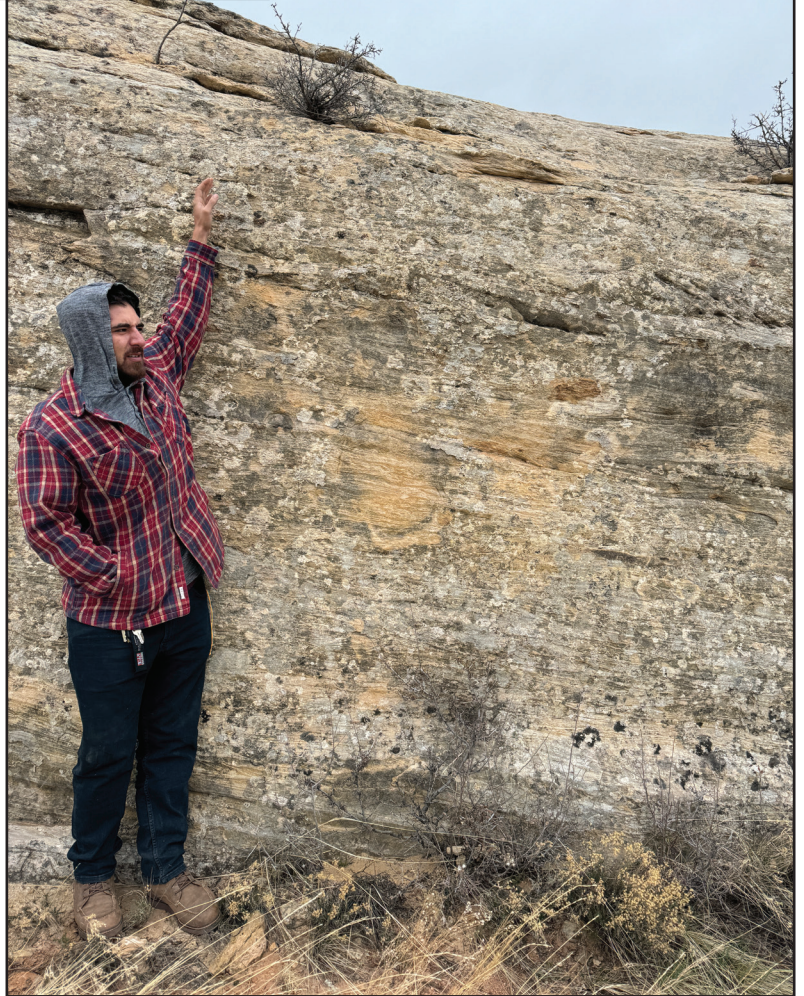




GEOL 4719/5719 students Corey and Jacob touching the paleo-Moho at Chenaillet ophiolite

Geology student Erik Perez examining an outcrop of the Lyons Sandstone north of Fort Collins on GEOL 3540 field trip, Spring 2024. The Lyons is the source of flagstone for CU's buildings in addition to hosting conventional hydrocarbon reservoirs and potential CO<sub>2</sub> sequestration targets in the Denver-Julesburg Basin.  
photo credit Max Pommer

Dr. Max Pommer and GEOL 3540 Petroleum Geology class at Red Mountain anticline north of Fort Collins. The rocks in the background are part of the Permian Ingleside Formation and are comprised of cyclically-interbedded eolian/tidal sandstones (red) and shallow-marine carbonates (grey/tan). Anticlines like this comprise historical oil fields along the Front Range, and lateral equivalents to this strata contain hydrocarbon reservoirs across the Powder River and Bighorn basins in Wyoming.



Dr. Max Pommer and GEOL 3540 Petroleum Geology class exploring sedimentary section in the Colorado Front Range.

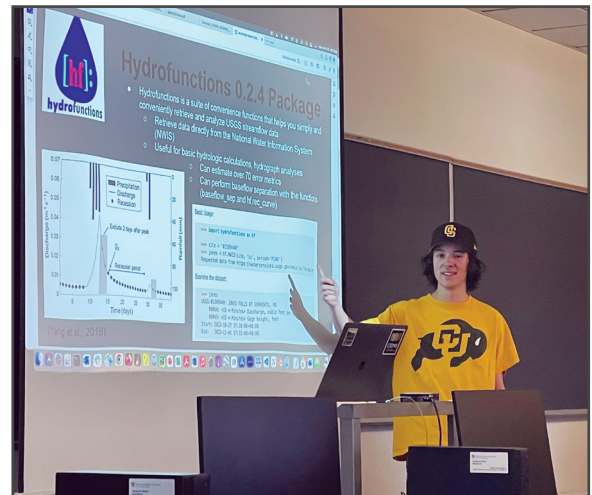




## Introduction of GEOL3600: Python for Earth Sciences by Greg Tucker and Irina Overeem

Geoscience in the 21st century demands a wide range of skills. Increasingly important among these are computing-oriented skills. In the Fall semester of 2023 Prof. Greg Tucker and Prof. Irina Overeem launched a new course: Introduction of Python for Earth Sciences (GEOL 3600). This new class aims to expose students to programming, data science, and numerical modeling, with specific applications to earth science problems. It turned out this topic was in demand with undergraduate as well as incoming graduate students. The classes were organized around hands-on computing exercises, with students working on topics like Earth's heat budget, river dynamics, geological units of Colorado, and visualization of grain-size data. Students shared their interests by presenting tips on specialized programming libraries. Once everyone had learned the fundamentals of computing and programming skills, students worked on their programming projects and pulled off interesting applications and mini-research projects. The inaugural run of the course seems to have been appreciated, with students commenting that “this course has been one of my favorite classes that I have taken at CU” and a “hands-on, project-based learning style is perfect for such a course”. Attention

to basic computing and programming was evaluated positively: “I enjoyed how we started from the ground such as learning how computer memory and hard drives work and went up from there with variables, loops, functions, and then packages”. The course will continue to be offered over the coming few years and will incorporate student feedback from this first run.



Nick Ayers sharing the niftiness of the Hydrofunctions Python Package.

photo credit: Irina Overeem.

## BAJEDI Update! by Jaelyn Eberle

This spring was a busy one for the Belonging, Accessibility, Justice, Equity, Diversity, and Inclusivity (BAJEDI) Committee! In February, the committee hosted over 70 Geological Sciences students, staff, faculty, and their families for a community-building Night At the Museum at the CU Museum of Natural History (<https://www.colorado.edu/cumuseum/>). The committee also organized two field gear swaps – a BIG thank you to all who donated jackets, fleece, backpacks, sleeping pads, and many other items!

Night At the Museum at the CU Museum of Natural History.



photo credit: Suzanne Anderson

Topping off a fine semester, the BAJEDI committee organized the department's inaugural spring formal entitled 'Party like it's 66 (million years ago)!' held April 26th. Over 100 members of our Geological Sciences community danced the night away in a tropical, Late Cretaceous-themed atrium in Benson Earth Sciences. Thanks to all for helping to build and strengthen our geological sciences community!



## Geological Sciences Community Outreach Event by Leilani Arthurs

The Geological Sciences Department hosted its inaugural “Earth Histories and Mysteries” public education and outreach event on Saturday, April 27, 2024. The event would not have been possible without the 60-plus volunteers from the GEOL Department, enrolled in GEOL courses, from the CU Museum of Natural History, and friends and family members of GEOL students and faculty members. These volunteers created and/or hosted 11 interactive stations, which represented the types of Earth phenomena and processes studied in the Department. The interactive stations addressed phenomena such as ocean acidification, fossils, meteorites, buildings and earthquakes, microbes, geologic time, groundwater, carbonates, landscapes and geophotography, and volcanoes. Also included was a GEOL Department informational table with a spin-the-wheel game.

Over 140 visitors attended the event, which was open to the public from 9:00 AM to 3:30 PM in the Biotechnology Building on the East Campus. Verbal feedback from visitors and volunteers on the day of the event as well as feedback after the event through an online visitor program evaluation form, online volunteer feedback form, and unsolicited email messages indicated volunteers and visitors alike tremendously enjoyed the outreach event and many said they hoped the event would run again next year. All in all, the inaugural event was a great success!



Undergrads Alyss and Sedi hosting the Volcanoes station.  
photo credit: Leilani Arthurs

Postdoc Jessica Hankins hosting the Ocean station.  
photo credit: Gianna Sullivan



Graduate student Harry Brodsky and faculty member Kevin Mahan help spread the word about what we study in the GEOL Department and attract possible future majors :)  
photo credit: Stephanie Plaza Torres





## Geological Sciences Graduate Student Association (GSGA) Activities

by Harry Brodsky, GSGA Coordinator

If you've roamed the second floor of the Benson Earth Sciences Building around noon on a Friday, you're probably familiar with the sight: Grad students emerging from their offices to gather in the hydrogeology classroom, beckoned by the tantalizing aroma of lunch. If you peeked in, you'd see dozens of grad students listening to student talks or staff presentations over a large plate of Chinese food — or empanadas or sushi, you name it. What have we been up to in there, and how did we snag such good eats? Grad Talk - a weekly self-organized grad student meeting. The department has supported this program for many years, but this year we also obtained funds from CU's student government, which supports student programs. The extra funding enabled us to increase the quality of food we can provide. But the student government didn't give us the money simply because we're foodies: We convinced them that the quality of food was key to engaging members of our community who might otherwise not attend. Indeed, the first time we served something other than pizza, I saw faces at Grad Talk that I had never seen there before.

Grad Talk is just one success of many that we've won this past year by carefully planning and allocating our resources and tenaciously pursuing student government funds.

It started in August 2023 with a survey that revealed grad students' top priorities. Since many students wanted to attend AGU but couldn't secure the funding, GSGA petitioned to send them on the student government's dime. They awarded us the maximum amount — over \$3,000. Another priority indicated by the survey was the department community. GSGA organized an evening social event with a lecture given by India Wood, a local writer who hiked a unique "X" path across Colorado. We also sponsored a department bowling night at the UMC. These were rare opportunities for faculty and students to connect in a non-work setting. To me, GSGA's most exciting accomplishment was the establishment of a grad student retreat. A handful of us drove to the YMCA of the Rockies and stayed in one of their beautiful cabins for a weekend — all paid for by the student government. We hiked, played sports, cooked meals and just hung out. In future years, the grad student retreat will be an essential step in grad student bonding, and integrating new students.

I am thrilled with the progress we made this year and am deeply grateful to the faculty and staff



Graduate students enjoying the good life during a grad retreat.

members without whom this work could not have occurred. Teamwork was key to GSGA's success, which reflects our exceptionally supportive community. I must thank our chair, Anne Sheehan, as well as Anne Marie Summers and Kara Bajdas for being exemplary advocates for grad students. With GSGA's momentum and strong allies in the faculty and front office, GSGA is positioned to continue its work and do incredible things in the future. I can't wait to see what the next generation of student leaders has in store for us!

**Your generous support  
helps to fund many  
of our graduate and  
undergraduate field trips.  
Thank you!**

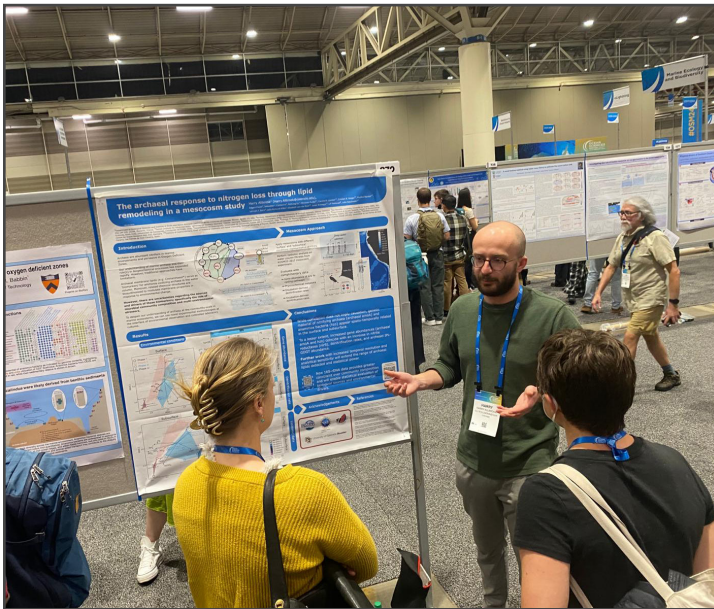


Graduate students getting ready to enjoy another GradTalk.



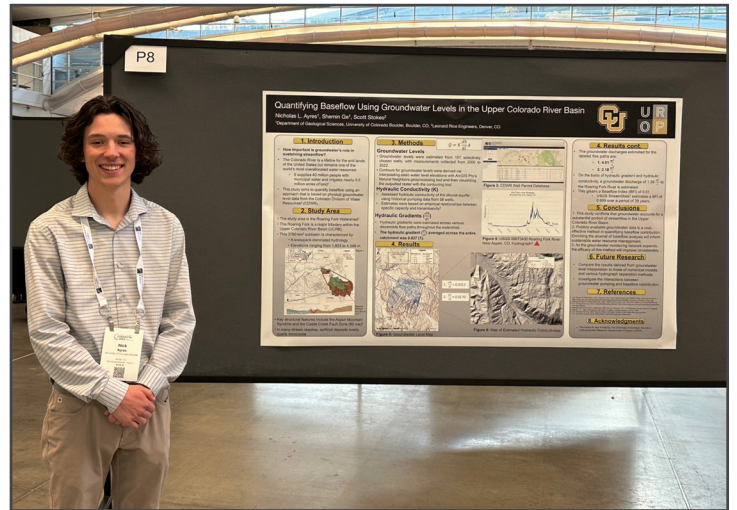
## Student Activities/Awards

**Harry Allbrook** was a recipient of travel funds to attend Ocean Sciences Meeting 2024 in New Orleans, Louisiana, to present his research poster titled, 'The archaeal response to nitrogen loss through lipid remodeling in a mesocosm study'. It marked his first time attending a conference of this scale (>5,000 attendees), representing a new and exciting milestone. The opening plenary session 'Water Tells Stories Through People in Louisiana' set the tone of the week- one of purpose, community, social justice, and connection. It brought voices of the local community to the forefront of the conference, emphasizing the real lives and communities that are impacted by decision-makers, and how attendees can become more aware advocates. The session was powerful and moving, shedding light on the way water shaped geopolitics in the South and the prevailing injustices that continue to disproportionately impact minority communities today. Throughout the week, individual sessions provided opportunities for Harry to connect with new potential collaborators with complementary research interests. He had the chance to engage with international collaborators from Europe for the first time, as well as colleagues from Chile, all against the vibrant backdrop of New Orleans.



Harry Allbrook, at OSM24, in discussion with attendees regarding the need for more studies of marine Archaea

**Nick Ayers** was awarded funds from the Kenneth Allen Johnston Memorial Scholarship which allowed him the privilege of traveling to the Geological Society of America (GSA) Connects conference in Pittsburgh to present his undergraduate research on quantifying baseflow in the Upper Colorado River Basin. Attending



Nick Ayers presenting his poster at GSA

the conference greatly bolstered Nick's research and provided valuable practice in developing effective scientific communication skills. The experience of meeting other young professionals and learning about the frontiers of geoscience research was inspiring and helped him develop insight into career paths.

**Cole Cochran** visited AGU23 thanks to the assistance of the Geology Department's fall travel grant. He took full advantage of the conference, arriving early each day to absorb as many scientific talks and posters as he could. As a first-time attendee of AGU, Cole was pretty shocked by the sheer volume of scientists, students, and educators around him. It was a wonderful flurry of activity. Cole enjoyed learning more about the active research happening within his field, geomorphology, as well as diving into everything from reconstructing past beaver populations using sedimentary DNA to the carbon balance of boreal peatlands. Attending AGU also helped him establish meaningful connections with the scientific community beyond Boulder. Cole was given the opportunity to meet peers at other universities and exchange ideas with people with whom he hopes to stay connected with in the future. He was also able to introduce himself to potential employers, which provided helpful insight as a soon-to-graduate master's student.

Cole was also inspired by the sites of San Francisco and is grateful to have explored some of the city's landmarks via its old-timey cable cars. Given the cost of AGU and the expense of traveling to San Francisco, Cole states that he would not have been able to take this opportunity without the Geology Department's travel award. Funds were put towards conference fees, lodging, meals, and public transit.



The experience has left a long-lasting impression on him, and it has been a highlight of his graduate school experience.



Photo by Cole Cochran

In the Summer of 2023 **Naomi Ochwat** and collaborator Yoram Terleth (PhD student U. Idaho) led a team of eight to the Gilkey Glacier, Alaska where they deployed instruments to study the formation of ogives (topographic waves in glacier ice that form at the bottom of “icefalls” - see photo). This was in collaboration with the Juneau Icefield Research Program (JIRP) and funded by the CIRES Innovative Research Proposal (IRP), led by Naomi and Yoram.

Naomi Ochwat (GEOL/CIRES), Ted Scambos (CIRES), and Liliana Margonari (PhD student at the University of Buenos Aires, Argentina) went to Crane Glacier, Antarctic Peninsula, Antarctica, in February 2024 to install timelapse cameras, GPSs, and a weather station to monitor the retreat of this large tidewater glacier.

Ted Scambos, Liliana Margonari, and Naomi Ochwat at Crane Glacier, Antarctic Peninsula, Antarctica



Naomi Ochwat received the Fall 2023 geology travel award to attend the AGU conference. This attendance allowed Naomi to present her recent research and attend a press conference on the fate of Antarctic ice shelves and glaciers. This was only possible due to the help of the department. Article featured here: <https://www.sciencenews.org/article/3-antarctic-glaciers-rapid-loss-climate-change>,



Gilkey Glacier and Vaughan Lewis Icefall, Juneau Icefield, Alaska

Naomi’s research was published in The Cryosphere in April 2024. Her research evaluated the drivers of the loss of the Larsen B fast ice in the Antarctic Peninsula and documented the initial retreat of the glaciers.

**Our graduate students  
are thankful for  
your continued support.**

**Juliana Olsen-Valdez** is a 5th year PhD student studying the sedimentology and stable isotope geochemistry of ancient lake carbonates and microbialites that formed in Nevada 60 Million years ago. She received a 2023-2024 Stephan Evans Research award to help fund her participation in the International Geobiology Course hosted at Pennsylvania State University in the summer of 2023. The course included two weeks of geobiology field work in east-central Italy, as well as hands-on experience in DNA extraction, metagenomics, organic geochemistry, pigments, and petrography on the Penn State campus. This course was invaluable for Juliana and left her with new scientific collaborations and a desire to continue studying the geobiology





Group photo from the International Geobiology Course during the summer of 2023 in east-central Italy.

of microbialites after her PhD. The Stephan Evans Research Award also allowed Juliana to investigate the micro-fabrics of ancient microbialite samples using microscopy and microspectroscopy techniques not often applied to microbialite samples.

PhD Candidate **Helle Leth Skjetne** received the Department of Geological Sciences Travel Funds Award. Her doctoral dissertation research is focused on impact and ejecta physics across the solar system. She studies secondary craters formed from fragments ejected during the excavation of a primary crater (on the Moon, Mars, and beyond) to enhance our understanding of how any given impact event facilitates the redistribution of material and, in turn, the development of planetary surfaces across the solar system.

Helle is very grateful to have received the Department of Geological Sciences Travel Funds Award to present her research progress during the 55th Lunar and Planetary Science Conference (LPSC) in the Woodlands, Texas between March 11–15, 2024—thank you for the contributions that supported the existence of this award! The Travel Funds Award enabled her first oral LPSC presentation, focused on the analytical model she is developing to describe the movement of material on the Moon through impact ejecta. In addition to the many aspects of learning and growth preparing for the presentation provided, which accelerated the progress of her dissertation research, the experience provided an invaluable opportunity to increase the visibility of her work to an international audience of researchers, network with workers in the field and potential future collaborators, and also promote the diversity of cutting-edge research students and faculty in the department engage in.

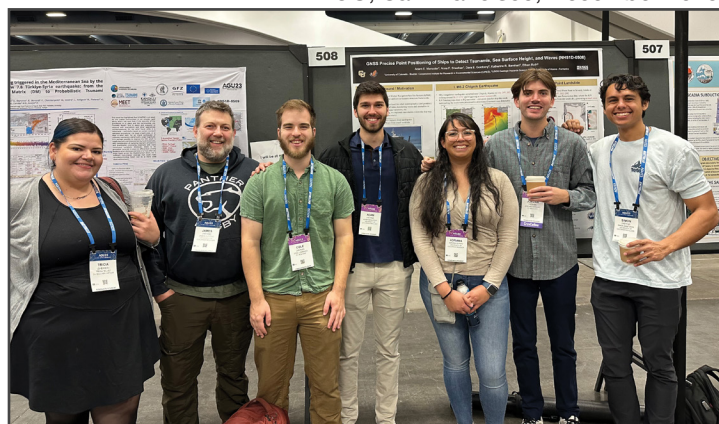


PhD Candidate Helle Leth Skjetne

Helle would like to provide a huge thanks to the administrative staff that enabled the logistics of this travel—especially Marilynn Bender and Ann Marie Summers.

**Liza Wernicke** traveled to Honolulu, Hawaii to present a poster at the AGU Chapman Conference: Remoting Sensing of the Water Cycle. She also completed her doctoral research, which included the creation and validation of the 3km SMAP/CYGNSS soil moisture dataset. This dataset is the first satellite soil moisture dataset with both fine spatial and temporal resolution and could benefit many hydrologic and climatic applications. The 3km SMAP/CYGNSS soil moisture dataset is currently awaiting final approval for publication at the NSIDC. Liza's manuscript regarding 3km SMAP/CYGNSS soil moisture is also under review for publication.

CU Geological Sciences graduate students (and one undergrad) at AGU, San Francisco, December 2023





Senior undergraduate student **Grant Peterson** joined the Templeton Lab as a lab assistant to research associate Eric Ellison. Grant works on experiments measuring hydrogen production during serpentinization reactions, which are under investigation as a potential new geologic hydrogen energy resource. He assists with cutting and pulverizing rock samples in the Rock Shop, assembling experiments in Parr reactors (pictured), and running the new Multiple Reactor System, and measuring hydrogen concentrations using gas chromatography. The results of Grant's experiments have been critical to meeting the science objectives necessary for triggering additional funding for an upcoming field pilot program in Oman. Grant was initially supported by the department's Bruce Curtis Mentorship Program and has continued with support from the Grantham Foundation for the Protection of the Environment. "I've witnessed firsthand how research requires adaptation and creativity, and Eric has modeled problem-solving techniques that



Lab assistant Grant Peterson performing his tasks in the lab.

I will take with me as I progress as a geosciences researcher," Grant says of his experience.

by Eric Ellison

## Bruce Curtis Mentorship Program

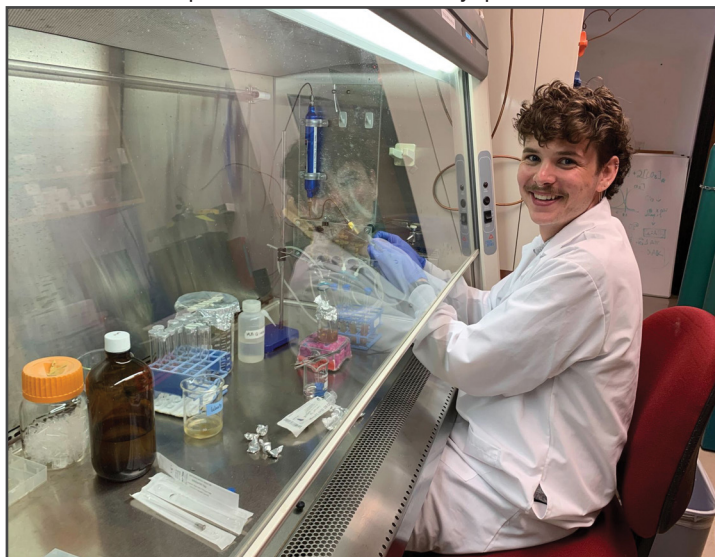
In Fall 2023, Carson Cucarola, a senior undergraduate student double majoring in atmospheric and oceanic sciences and biochemistry, joined the Templeton Geomicrobiology and Geochemistry group as an undergraduate research assistant. Working closely with Dr. Srishti Kashyap, a postdoctoral researcher in the group, he actively engaged in a project focused on mineral-based microbial metabolisms in serpentinizing environments. This project was initiated thanks to the generous support of the Bruce Curtis Mentorship Program. As part of the project, Carson conducted targeted microbial enrichments to assess if Fe(II/III) bearing phases found in serpentinites could serve as potential oxidants and/or reductants needed to support their metabolisms.

Carson arrived in the group with no prior lab-based research experience, particularly in geochemistry and geomicrobiology, but grew to love it for this past year. He quickly immersed himself in the complexities of synthesizing minerals, creating media for anaerobic cultures, and mastering anaerobic sampling using needles, and syringes, and has now become an expert microbial culture curator. Over the past year, Carson's cultures expanded from 12 to over 100, a true testament to his dedication, and excitement about discriminating the specific metabolisms and traits represented in his experiments. His work identified several microbial consortia capable of intriguing mineral-based metabolisms, of which many represent

hydrogen consumption-based metabolisms. He will be joining the group this upcoming year as a full-time Professional Research Assistant, and applying these microbial consortia to understand microbial hydrogen consumption rates in subsurface fractured-rock ecosystems. Quantifying such rates of hydrogen consumption is essential to understanding subsurface biosphere functioning, particularly as efforts ramp up to stimulate hydrogen production in such systems. He looks forward to contributing to these impactful research pursuits while growing both professionally and as an academic researcher.

by Srishti Kashyap

Carson working in the biosafety hood getting ready to set up his first cultures. photo credit: Srishti Kashyap





## Learning to Mentor by Harry Brodsky

Thinking about the skills I would gain through grad school, I decided that learning to be a good mentor was a priority. I was eager to take on an undergraduate geology student and guide them through a project of their own, which is why I applied for funding through the Bruce Curtis Undergraduate Mentorship Program. With the Bruce Curtis program's support, I was able to hire Lucianna Baright (GEOL '24) to take on a research project that I was interested in but didn't have the bandwidth to tackle.

Lucianna hit the ground running. On the first day of her research assistantship, Lucianna and I talked for hours about the aqueous geochemistry topics that would be relevant to her study of reactive mineral surfaces. First, we discussed how a mineral called brucite reacts with water to produce hydrogen. Then we devised an experiment to test whether dissolved phosphate could adsorb or "stick" to the surfaces of brucite, blocking water from reacting with the mineral. I knew instantly that we would work well together when Lucianna stopped me to clarify certain theoretical details, challenging me to reconsider the boundaries of my own knowledge on the subject.

Over the course of her senior year, Lucianna and I learned a ton. Lucianna conducted experiment after experiment and overcame challenge after challenge, gaining in the process a deep understanding of experimental aqueous geochemistry, gas- and liquid-phase chromatography, and the research project lifecycle. For my part, I gained experience guiding a mentee's project to completion without too heavy or light a hand. And together, we showed how "sticky" chemicals like phosphate could affect how much hydrogen brucite can produce.



Lucianna Baright performing experiments in the lab.  
photo credit: Harry Brodsky

The Bruce Curtis program allowed two geology students to develop research and mentorship skills through the execution of a cutting-edge research project. Lucianna, who graduated this year, is off to pursue a career in geochemistry research, and I'm excited to use my new mentorship skills to guide students in the future. Our department is lucky to have such a cool and helpful program to support student research. I highly recommend any grad students who are interested in mentorship apply today!

Photo of Long's Peak by Karl Mueller





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# Student Awards

## Department Travel Awards

Harry Allbrook, 23  
Nicholas Ayres, 23  
Harpreet Batther, 23-24  
Laurel Bayless, 24  
Samuel Cartwright, 23  
Cole Cochran, 23  
Jennifer Davis, 24  
Connor Antonio Diaz, 24  
Halina Dingo, 24  
Abby Eckland, 23

Corey Flynn, 23  
Catherine Fontana, 24  
Liam Friar, 24  
Fabiana Fuentes Arias, 24  
Vanessa Gabel, 23  
Andrea Halling, 24  
Lindsay Harrison, 24  
Brianna Hibner, 24  
Robert Kelleher, 23  
Melia Kendall, 23-24

Rhys-Jasper León, 24  
Sarah Leventhal, 23-24  
Tyler Lincoln, 23  
Cole Lombardi, 23  
Wolfgang Lopez, 23  
Adam Manaster, 23  
Jo Martin, 24  
Nicole Mizrahi, 24  
Lena Nyblade, 23  
Naomi Ochwat, 23-24

Juliana Olsen-Valdez, 24  
Helle Leth Skjetne, 23  
Trisia Tellez, 23  
Stephanie Tkacik, 24  
Liza Wernicke, 23  
Tyler Wickland, 23  
Collette Wilfong, 23  
Spencer Zeigler, 24

## Best Poster Award 2024 CU Boulder Hydrological Student Science Symposium

Nick Ayres

## AWG Laramide Chapter 2023 Geoid Scholarship Award

Fabiana Fuentes Arias

## AWG Laramide Chapter Outstanding Student Award

Skye Fernandez  
Sedinam Biassi-Bogart

## Marcy and Bruce Benson Distinguished Graduate Fellow AY 2023-2028

Jacob Simms

## Marcy and Bruce Benson Distinguished Graduate Fellow AY 2022-2027

Jordan Herbert

## Benson Graduate Fellows: AY 2023-2024

Jim Gutowski  
Holly Fortner  
Ethan Pierce  
Amanda Steckel

## Benson Graduate Fellows: AY 2024-2025

Lindsay Harrison  
Catherine Fontana

## Spetzler Research Awards

Harry Allbrook  
Connor Antonio Diaz  
Robert Kelleher  
Juliana Ruef  
Amy Vodopyanov  
Tyler Wickland

## Peter Molnar Memorial Scholarship

Mark Irby-Gill

## NSF GRFP

Connor Antonio Diaz

## Neal J. Harr Award, RMAG Foundation

Sydney Ciechanowicz

## Jacob Van Ek Award, CU Boulder College of Arts and Science

Simon Bantugan

## Nordic International Glaciological Society Best Student Presentation Award

Naomi Ochwat

## CIRES - Armstrong Memorial Scholarship

Naomi Ochwat

## National Science Foundation Travel Award

Naomi Ochwat

## Graduate School Chancellor's Fellow

Jo Martin 2023-2028

## Geological Sciences Award for Excellence (GSAFE)

Rhys-Jasper Leon 2023-2025

## NASA FINESST Fellow

Harry Brodsky AY 2022-2025  
Liam Friar AY 2023-2026

## College of Arts and Sciences Amazing Grads 2024

Sedinam Biassey-Bogart



## Undergraduate Student Awards

### Marco J. DeMarco Scholarship

Desiree Dsouza, 23-24  
Soren Rollin, 24-25

### Donald L. and Marilyn R. Gustafson Scholarship

Grant Peterson

### Kenneth Allen Johnston Memorial Scholarship

Rachel Abel, 23-24  
Grant Peterson, 24-25

### Marc and Doris Kolber Scholarship

Leo Zook, 23-24  
Ryan Flat, 24-25

### Stephen Evans Scholarship

Haikal Abu Bakar, 23-24  
Sydney Ciechanowicz, 24-25  
Isaac Leb, 24-25

### T. Keith Marks Scholarship

Andres Reyes, 23-24  
Faria Khan, 24-25  
Zuri Rose, 24-25  
Karim Brhili, 24-25

### Philip George Worcester Scholarship

Reilly Kaczmarek, 23-24  
Anyia Keena, 24-25



## Graduate Student Awards & Fellowships

Spring 2024 Department Graduation Ceremony

### Bruce Curtis Scholarship

Halina Dingo, 23-25  
Fabiana Fuentes Arias, 23-24  
Wolfgang Lopez, 24-25  
Lena Nyblade, 24-25  
Juliana Ruef, 23-25

### Dr. John D. Edwards Scholarship

Brianna Hibner, 23-24  
Rhys-Jasper Leon, 23-24  
Vanessa Gabel, 23-24  
Harpreet Batther, 24-25  
Catherine Fontana, 24-25  
Abigail Eckland, 24-25

### Stephen H. Evans Scholarship

Connor Antonio Diaz, 23-24  
Catherine Fontana, 23-24  
Joel Johnson, 24-25

### T. Keith Marks Scholarship

Barra Peak, 23-24  
James Gutoski, 24-25  
Haley Brumberger, 24-25  
Juliana Olsen-Valdez, 24-25

### Timothy William Stanton Scholarship

Jo Martin, 23-24  
Harpreet Batther, 23-24  
Harry Allbrook, 24-25  
Connor Anionio Diaz, 24-25

### Henry A. Waldrop Scholarship

Joel Johnson, 23-24  
Laurel Bayless, 23-24  
Rhys-Jasper Leon, 24-25  
Amanda Steckel, 24-25

### Longley, Wahlstrom & Warner Fellowship

Harry Brodsky, 23-25  
Juliana Olsen-Valdez, 23-24

### Chancellors Postdoctoral Fellowship

Liannie Velazquez-Santana, 24-25

### Lucas J. Kimes Postdoctoral Fellowship

Liannie Velazquez-Santana, 24-26



## Degrees Awarded

(Fall 2023- Spring 2024)

### BA Geology Majors

Lucas Albertoni  
Nicholas Ayres  
Simon Artemio Bantugan  
Lucianna Baright  
Sedinam Bogart  
Andrew Carter  
Mason Cato  
Kate Droblich  
Skye Fernandez  
Breno Goldenberg Araujo  
Isla Griston

Patrick Harper  
Coen Hines  
Jeremiah Klinkerman  
Andres Reyes  
Jaxon Robinson  
Amir Akmal B Romly  
Jonathan Rosenstrach  
Jazmin Schwab  
Nicholas Syah  
Bryan Troast  
Leo Kent Zook

### Graduating with honors

Nicholas Ayres  
*magna cum laude*

Simon Artemio Bantugan  
*magna cum laude*

Sedinam Biassey-Bogart  
*cum laude*

Kate Droblich  
*cum laude*

Andres Reyes  
*magna cum laude*

Amir Akmal B Romly  
*summa cum laude*

#### Advisor(s)

Dr. Shemin Ge

Dr. Lang Farmer

Dr. Shijie Zhong

Dr. Lizzy Trower

Dr. Thomas Marchitto

Dr. Lizzy Trower

#### Thesis

Quantifying baseflow using groundwater levels in the Upper Colorado River Basin.

The significance of crystalline material in basalts at the Granillo Rojo scoria cone in the Galapagos archipelago.

Constraining the asthenospheric viscosity using observations of relative sea level change associated with the glacial isostatic adjustment process.

The American Pika: An agent of chemical weathering.

Tracking rare earth elements in an acid mine drainage stream: Lion Creek, Empire, Colorado.

A proposed formation of unique crystallographic ikaite as a key proxy for identifying frigid ancient climates in Creede, Colorado during the Late Oligocene.

Spring 2024 Department Graduation Ceremony





## MS Candidates Graduating with Degrees

	Advisor(s)	Thesis
Adriana Nicole Alfaro	Dr. Kristy Tiampo Dr. Mike Willis	Water Level and Sea Ice Applications for Global Navigation Satellite Systems Interferometric Reflectometry in Greenland and the United States.
Cole Cochran	Dr. Suzanne Anderson	Floodplain carbon storage: soil organic carbon, surface age, and vegetation in an icy river corridor.
Fabiana Fuentes Arias	Dr. Anne Sheehan Dr. Shemin Ge	Pore Pressure Effect on Coulomb Stress Change and Earthquake Triggering in the Raton Basin, Colorado – New Mexico Region.
Adam Manaster	Dr. Anne Sheehan	Feasibility of GNSS Precise Point Positioning of Ships to Detect Tsunamis, Landslide-Generated Waves, and Other Anomalies in Sea Surface Height.
Stephanie M. Plaza-Torres	Dr. Boswell Wing	New applications of carbon stable isotope geochemistry to coprolites and plant fossils.
Earl J. White Jr.	Dr. Boswell Wing	Does CH <sub>4</sub> -CO <sub>2</sub> photochemistry generate <sup>12</sup> C-enriched organic hazes in Archean analog atmospheres?

## PhD Candidates Graduating with Degrees

Amanda M. Alexander	Dr. Carolyn Crow Dr. Simone Marchi Dr. Stephen Mojzsis	Consequences of impact-induced deformation and fracture: from metal asteroids to the early Earth.
Toby Ann Halamka	Dr. Sebastian Kopf	Investigating the Source Organisms, Physiological Functions, & Paleoenvironmental Applications of branched GDGTs.
Andrea Halling	Dr. Carl Simpson Dr. Boswell Wing Dr. Patrick Kocielek	Evolutionary and ecological significance of multicellularity: Insights from experimental, fitness, and isotopic perspectives.
Ellie Hara	Dr. Alexis Templeton	Cyanide Dynamics in Serpentinizing Systems: Implications for Prebiotic Chemistry.
Sarah Leventhal	Dr. Carl Simpson	The macroevolution of complex colony-level traits in cheilostome bryozoans: origins and impacts.
Barra Augusta Peak	Dr. Becky Flowers	Continental Breakup, Mountain Building, and the Great Unconformity: The Exhumation History of North America's Most Iconic Erosional Surface Using Zircon (U-Th)/He Thermochronology.
Liza Wernicke	Dr. Eric Small Tilton	Planetary water: Quantifying water stored in Martian hydrated minerals and downscaling SMAP soil moisture to 3km using CYGNSS reflectivity.
Collette Wilfong	Dr. Leilani Arthurs	Impact of Teaching-Focused Professional Development on Instructional Decision Making in STEM Education.



# Jerry Crail Johnson Earth Sciences & Map Library

by Ilene Raynes

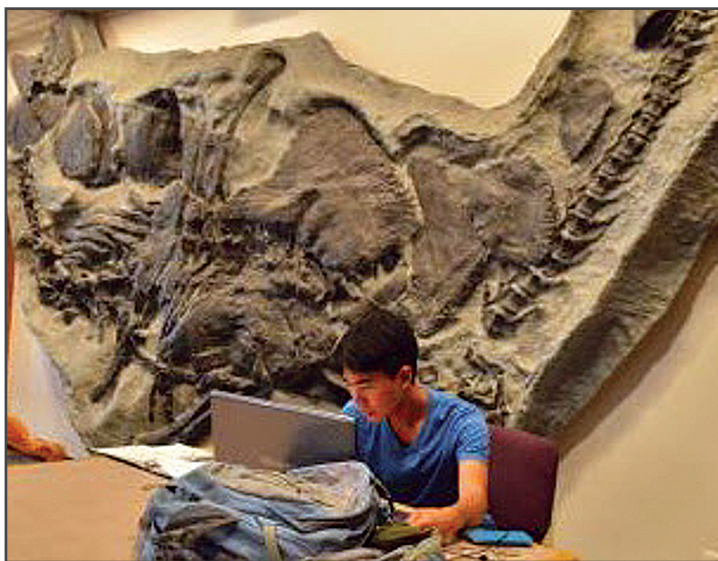
## What the library can offer you:

The Jerry Crail Johnson Earth Sciences & Map Library offers materials in Earth and Environmental Sciences, Geology, and Physical Geography. The library provides maps, geographic information systems (GIS) support, and geospatial data services.

Our Map Collection serves the needs of both sciences and humanities with a collection of over 200,000 maps as well as atlases, geographic reference books, and Colorado historical aerial photographs. <https://www.colorado.edu/libraries/libraries-collections/rare-distinctive/map-collection>

Researchers and students can contact Phil White, your liaison librarian, with questions about Geospatial Data and GIS. <https://www.colorado.edu/libraries/philip-white>

Librarians are happy to help alumni and members of the public with research questions.



Students love to study alongside the cast of a baby stegosaurus in the Jerry Crail Johnson Earth Sciences & Map Library.

## Updated library hours for Fall 2024:

The Earth Sciences & Map Library will offer expanded open hours in Fall 2024. Beginning in August, our hours will be 9 am to 8 pm Monday through Thursday, 9 am to 5 pm on Fridays, and 12 pm to 8 pm on Sundays. The library will be closed on Saturdays.

## Interesting acquisitions:

### eBooks:

We continue to supplement the Earth Sciences collection with Geology and Geosciences ebooks from GeoScienceWorld. contact Phil White (<https://www.colorado.edu/libraries/philip-white>) to learn more about what is available.

## Some notable Map Library purchases:



Oil in America, Standard Oil Company, 1957.

Students are fascinated by this mid-century map which promotes the surprising uses of oil.

## Gifts to the Map Library:

17th-20th century Asian maps: three Chinese hand-painted maps of provinces; two travel guides of Beijing and Shanghai; two Japanese WWII era maps; four Chinese geography school books. Two military exploration maps of the Southwest United States from the early 19th century.

## Instruction and research services:

During the past year, the Map Library hosted more than 40 classes covering subjects such as geology, geography, environmental design, writing, English, Spanish, Art, and Asian Studies. Professors bring students to the Map Library to learn about library resources and to connect maps and geography to topics in class.

## Reference question highlights:

- Finding locations of old mining claims for Geology students.
- Locating early property maps of the Pueblo area.
- Finding aerial photographs for students and public patrons covering areas of interest.
- Researching the name change of a specific peak by using topographic maps over time.
- Assisting a public patron in her quest for detailed geologic maps of Northwestern Colorado.
- Advice for modeling solar energy potential in Sub-Saharan Africa using GIS.
- Technical help conducting object-based image classification for floodplain vegetation using Python.
- Help finding historical Japanese place names and Guidance for integrating Japanese characters into a historical GIS.





Geological Sciences undergraduates use their home library to work on structural geology assignments.

### Highlights from the past year:

- **Culture Crawl 2023:**

In September 2023, the Earth Sciences & Map Library participated in the 3rd Annual CU Boulder Culture Crawl. The library hosted workshops with local artist Charlotte Bassin in which participants made their own watercolor and flower world maps, and an international chocolate tasting. The library collaborated with The Geological Sciences Graduate Association (GSGA) during the tasting event, with graduate students on hand to discuss the conditions needed in various regions for successful cocoa cultivation. These events were highly attended and the chocolate tasting event brought over 100 participants to the Benson Building.

- **Joint Earth Sciences & Map Library/GSGA event:**

In March 2024, the Earth Sciences & Map Library hosted “Hiking the Colorado X,” a talk by Colorado writer India Wood about her walk across the state diagonally in both directions, with advice for students about field work and access to private lands, overcoming personal challenges, and geology along her route.



Geological Sciences Graduate Association members and guests share dinner and discussion with India Wood, as she describes her walk across Colorado.

**There is always a rotating exhibit and permanent materials on display at the Earth Sciences & Map Library.**

### Coming attractions:

- **Culture Crawl 2024:**

The 2024 Culture Crawl will be held on September 25th. The afternoon will feature an international candy tasting event, and the library anticipates involving geology graduate students; this time in discussing environmental conditions needed to grow sugar (cane and beets). For more information on the Culture Crawl including dates and times of event, See <https://www.colorado.edu/libraries/culture-crawl>.



Students enjoying chocolate tasting and map reading at the 2023 Culture Crawl. The Earth Sciences & Map Library looks forward to hosting a candy tasting in 2024.

Geological Sciences Graduate Association members and map librarians create a world map using flowers, along with artist Charlotte Bassin.



## Alumni News

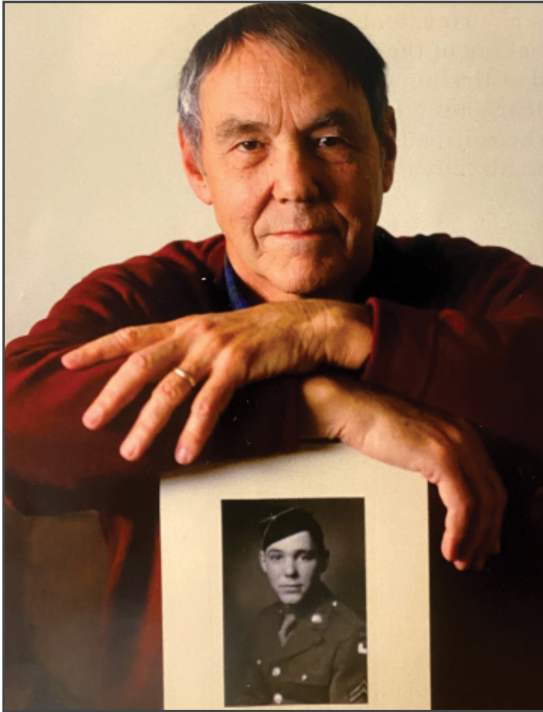
**Greg Markham** - after getting my geology (AS) degree (79) I went to CU law school ('83). Been practicing law in HI for 40 years. I still enjoy geology every where I go. Married my CU girlfriend, now wife of 43 years. Go Buffs!

*We want to hear  
from you too...*



[GeoAlum@Colorado.EDU](mailto:GeoAlum@Colorado.EDU)

## In Remembrance



### **Bill Bradley, Professor Emeritus**

Professor Emeritus Bill Bradley passed away in Boulder, Colorado on September 7, 2023. Bill was a Professor in the CU Department of Geology (now Geological Sciences) from 1955 - 1989 and served as Department Chair from 1968 - 1972. Many of his students, even non-geology majors, remember him as "...the best teacher I ever had". Bill was born in 1925 to Josephine Crane Bradley and Harold C. Bradley and grew up in Madison WI, the youngest of seven sons. Bill's father was a professor of physiological chemistry at the University of Wisconsin, inspiring Bill and four of his brothers to become professors. World War II found Bill, just out of high school, joining his oldest brother at Camp Hale in Colorado as a ski troop instructor for the Army's 10th Mountain Division. Later, as a Second Lieutenant in the 7th Armored Division, he fought at the Battle of the Bulge, for which he received the Silver Star for bravery. In 1947 Bill married Virginia Biart of Madison, WI. They had two daughters, Meredith and Cameron, and later divorced. In 1950, during his senior year at the

University of Wisconsin, Bill contracted polio. After two years of rehab, he regained the ability to walk, with the help of a metal leg brace and cane. Bill always saw the silver lining in this; polio made him ineligible for military service in Korea, for which he had been called up. Bill earned his doctorate in geology from Stanford University, specializing in geomorphology, and began teaching at the University of Colorado - at that time a small teaching-oriented school. Bill was a dedicated teacher, and in 1981 the University awarded him the Boulder Faculty Assembly Teaching Award, based on student recommendations. After Bill's retirement from CU the Geological Society of America named him a recipient of the Distinguished Career Award for his contributions to geomorphology. In retirement, he served as the field geologist on the Cloud Ridge Naturalists' river rafting trips. In 1957 he met Alice Louise Babcock, via a letter of recommendation from his brother Ric; they married a year later and had two children, Melanie and Mark. The family spent most summers traveling the US as Bill pursued geological fieldwork. In addition, there were year-long sabbaticals to Austin TX, Adelaide Australia, and Aberystwyth Wales. Second only to geology was Bill's passion for conservation. In 2002, the Nature Conservancy honored him as the only person to have been a member continuously, since its founding in 1951. Bill is survived by his beloved wife, Louise (Weezie), and three children: Cameron Ray (Jim) of Nashville TN, Melanie Rohrbach (Richard) of Atlanta GA, and Mark Bradley (Shelby Pawlina) of Boulder - as well as one brother, Ric Bradley of Colorado Springs. He is also survived by five grandchildren: Alex Ray (Caroline) of Austin TX, Nicholas Ray (Erminia) of Salt Lake City UT, Emery Shae Bradlina of Boulder CO, Claire Rohrbach of Chicago IL, and William Rohrbach of Atlanta GA.

**In memory of Bill's profound contributions to our community and his dedication to advancing education, his family is proud to establish a new fund in his name. This fund will provide vital support to students, faculty, and initiatives that reflect Bill's commitment to excellence and mentorship. His legacy will continue to inspire and uplift future generations.**





### Donald Allen Coates

Donald Allen Coates (B.A. Geology cum laude 1961, and MS Geology 1964) was born in Sonoma, California, in 1938. After high school, Don spent 1956-57 at Santa Rosa Junior College, where he was introduced to his passion - geology. He then enrolled at C.U. Boulder, writing his 1964 MS thesis on marine terraces near Santa Cruz, CA under the direction of Prof. Bill Bradley.

The period from 1964 to 1975 saw Don in a whirlwind of activities, including four field seasons in Antarctica (where a hill in Victoria Land now bears his name), visits to New Guinea and Argentina, and living in California, Ohio, and Colorado. Don enrolled at UCLA and studied Permian glacial stratigraphy in Argentina for his PhD dissertation, completed in 1969. From 1975, Don was employed by the USGS in Denver, initially in the Coal Branch, where he became an expert on clinkers, formed by fires in coal seams in the Powder River Basin. Later he worked on projects in Costa Rica (coal), and Bangladesh (groundwater). After retiring from the USGS in 1995, he consulted on water issues in Northern California. In 2021, Don returned to Colorado. He died in Wheat Ridge, Colorado, on July 30, 2023. Survivors include a son and two daughters from his first marriage. His first wife, from 1968 to 1994, was Mary-Margaret Hepp Coates (MS Geology 1965), who survived him by several weeks, dying on September 6, 2023. His second wife, Kathryn Norman, pre-deceased him.

by Fred Barnard PhD '68

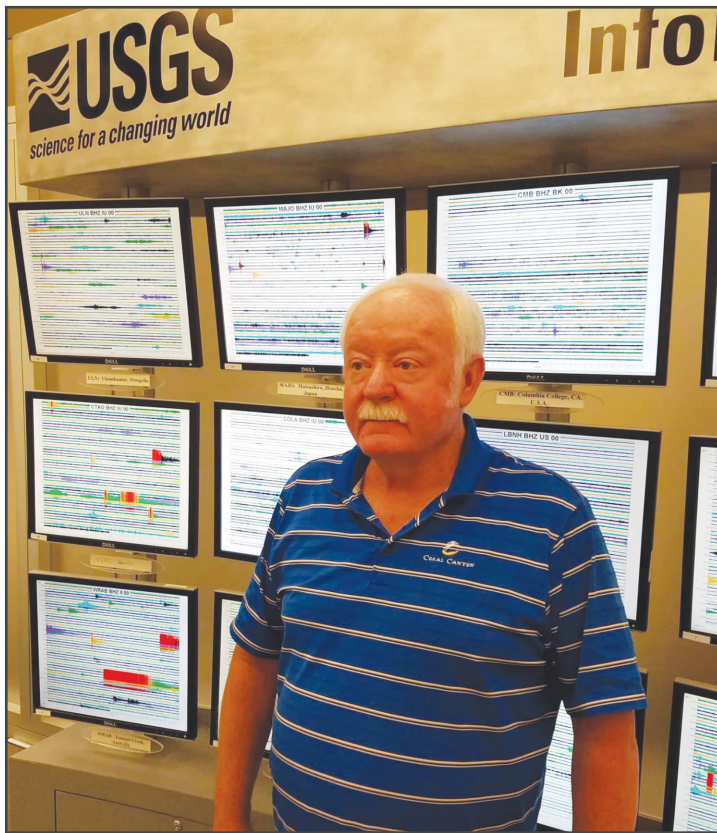
### Mary-Margaret (Hepp) Coates

Mary-Margaret (Hepp) Coates, MS Geology 1965, died in Wheat Ridge, CO on September 6, 2023, at age 83. She was married to the late Donald Coates (MS Geology 1964) from 1968 to 1994 and is survived by her three children and one grandchild. Mary-Margaret ("MM") was born in Bartlesville, OK. She attended Beloit College in Wisconsin, receiving a double BA in Government and Geology in 1962 as a Phi Beta Kappa. She attended C.U. graduate school from 1963-65, receiving her MS based on mapping Precambrian rocks in Big Thompson Canyon under Prof. Bill Braddock. She also did fieldwork during two summers in Montana, as an assistant to USGS geologist Betty Skipp (1928-2023) and was co-author of USGS Map GQ-729 (Hatfield Mountain quadrangle, Montana). In 1966, MM joined the Beloit College Geology faculty but returned to Colorado to teach 1967-68 at the University of Northern Colorado. After marrying, she and Donald Coates lived in Columbus and Cleveland, OH, and in 1975 moved to the Denver area. MM undertook technical editing, principally for the USGS, and taught technical editing at Metro State University and the School of Mines in the 2000's. She volunteered for 25 years at Roxborough State Park, where she designed educational materials and gave talks on local geology. MM was widely traveled, visiting New Zealand, Australia, Oman, India, Chile, Argentina, Peru, and Mexico, plus numerous trips to Europe, especially Spain.

by Fred Barnard PhD '68







**Dale Robert Grant**

Department alumnus and benefactor Dale Grant passed away on December 1, 2023. Dale received his BA in Geology with a Geophysics emphasis from the Department of Geological Sciences in 1979. He took an indirect path to his degree, starting in the early 70s and then taking a break of several years to work as a ski lift operator, whitewater-rafting guide, and surveyor with the state highway department before returning to CU in 1978 to complete his degree. His first job out of college was with a geothermal company, which took him around the western United States conducting gravity and magnetic surveys. He next worked for Geophysical Services Inc. (now Halliburton), with geophysical fieldwork in Oman, China, and Saudi Arabia. Later in his career, he worked at the US Geological Survey, first on the Yucca Mountain Project and later with the National Earthquake Information Center.

**The Department greatly appreciates Dale's support over the years and his generous endowment through his estate plans. This remarkable contribution has established the Grant Family Geological Sciences Endowed Fellowship Fund, which will significantly benefit future generations of students.**

**James Michael "Jim" Kelly**

James Michael "Jim" Kelly (B.A. Geology, 1964; M.S. Geology, 1967) died September 5, 2023, at his home outside Bellingham, Washington. Jim was born on 4 Sept, 1941 in Bishop, CA, and grew up in Los Alamos, NM. An early interest in geology was inspired by his father's profession in science, and by the environs of Los Alamos. Degrees followed from C.U. Boulder (B.A. in Geology, 1964 and MS in Geology, 1967) and University of Wisconsin, Madison (PhD in Economic Geology with chemistry minor, 1971). His MS thesis involved mapping Precambrian rocks in the Rattlesnake Park area of Larimer County, under Prof. Bill Braddock. While at Boulder, Jim married Susan "Sue" Nielsen in 1970. He fully enjoyed Colorado's outdoors, backpacking on the Flat Tops, hunting elk, and fishing. Jim joined Getty Minerals in Salt Lake City in 1971 and advanced to the leadership of Getty's U.S. metals exploration program. In the early 1980s, he was recruited to the vice-presidency of Atlas Minerals in Denver, overseeing exploration efforts that yielded a gold discovery at Grassy Mountain, Oregon. Later he was Senior Vice President for Viceroy Resources, which explored worldwide and also re-developed the historic Castle Mountain gold mine in southeastern California. Jim moved to Washington State in 1999, eventually retiring there. In 2005 he married Linda Savage, who survives him. He is also survived by his first wife Susan and his son Tyler. His daughter Erica predeceased him in 1995.

by Fred Barnard PhD '68







### **Ed Larson, Professor Emeritus**

Edwin “Ed” Larson was born on January 5, 1931, in Los Angeles, California, and passed away peacefully on March 1, 2024. From a young age, Ed displayed exceptional intellect and athleticism. He excelled in school and sports including track and gymnastics, even qualifying as an alternate for the US Olympic Gymnastics team. Following his service during the Korean War with the US Army, Ed pursued his passion for geology, earning his BA and MA in Geology from UCLA in 1954 and 1958, respectively. He continued his academic journey, attaining his PhD in Geology from the University of Colorado at Boulder in 1965, in addition to several post-doctoral fellowships, including one at MIT and another in Japan. Ed dedicated nearly 30 years to the University of Colorado at Boulder, serving in various roles, including Assistant Professor, Associate Professor, and Full Professor. Throughout his career, Ed’s influence extended beyond his classroom. He co-authored a textbook that served as a cornerstone in geological education for nearly 20 years and volunteered to help local teachers with field trips and curriculum improvements. A true adventurer at heart, Ed loved exploring the great outdoors. He was an accomplished mountaineer, backpacker, and river navigator, having braved the rapids of numerous rivers, including the mighty Colorado in the Grand Canyon. Though Ed never married or had children of his own, he cherished his relationships with his two brothers, Tom Larson and Vern Larson, as well as his many nieces and nephews, all of whom adored him. Additionally, Ed enjoyed a circle of close friends, many of whom were previous colleagues

or students. Eric Miller, a former graduate student, became like a brother to Ed. Ed was a passionate advocate for numerous causes, including animal rights, social justice, and environmental protection. He was gregarious, fun-loving, and always the life of the party. Family and friends fondly remember that any experience with Ed was an opportunity to learn, especially about the natural world. His passion for science was contagious, and he had a unique gift for sparking the love of science in many people. Whether he was sharing fascinating geological facts during a hike, identifying a bird or flower, pointing out constellations on a clear night, or simply discussing the intricacies of nature over a campfire, Ed’s enthusiasm was infectious. He had a knack for making complex concepts accessible and engaging, leaving a lasting impression on all who had the pleasure of learning from him.

## **Thank you Donors**

**The Department of Geological Sciences enjoys the philanthropic support of generous donors. Geological Sciences uses this support to conduct research, teaching, and learning opportunities for students, and faculty members.**

**Gifts given to endowed funds help to underwrite PhD student fellows, undergraduate fellows, visiting scholars, public lectures and events, and other programming. The Department also manages “current use” gift funds which supplement its annual budget.**

**Thank you for your generous support of The Geological Sciences Department!**



## Mark James Robbins

Mark J. Robbins, PhD, 36, passed away in an automobile accident in Jackson Hole, Wyoming on July 21, 2023. Mark was a geologist - specifically a glacial geochemist - and an Earth sciences educator. He earned his undergraduate degree in geology from the University of Colorado Boulder in 2010, where he was elected to Phi Beta Kappa and received the RMAG Outstanding Senior Award. He earned his PhD in geology from the University of Michigan, where he served as a lecturer in the Earth and Environmental Sciences Department. He was in his 'Happy Place' when he died: Camp Davis, the University of Michigan's Rocky Mountain field station, Jackson Hole, WY, where he was the head instructor for two months each summer.

He began teaching while in graduate school and quickly learned he both enjoyed it immensely and had a talent for helping students master difficult concepts. Throughout his years of teaching, both as a graduate student instructor and as a lecturer across multiple different science courses, Mark had an impact on so



many people. He was loved by all his students, many of whom describe him as the best teacher they've ever had. A former student described him as having "a twinkle in his eye" as he was quick to laugh and quicker to smile.

from [obits.masslive.com](https://obits.masslive.com)

## In Memoriam

**William Bradley**

(Geol Prof'55 - '89; Chair'68 - '72)

**Donald A. Coates (Geol'61; MS'64)**

**Doris Wilder Hallgren (Geol'48)**

**Mary-Margaret Hepp Coates (MGeol'66)**

**Dale Grant (Geol'79)**

**Richard C. Hepworth (Geol'59)**

**Travis H. Hughes (PhDGeol'67)**

**James M. Kelly (Geol'64; MS'67)**

**Ed Larson (PhDGeol'65)**  
(Geol Prof'67 - '97)

**Anson Mark (MGeol'58)**

**John R. Matelock (Geol'73)**

**Peter A. Matter (Geol'61)**

**James W. Mulholland (Geol'64)**

**John R. Murphy (Geol'59)**

**Mark J. Robbins (Geol'10)**

**Charles A. Ross (Geol'54)**

**Betty Lindberg Skipp (MGeol'56; PhD'85)**

**Margo I. Toth (MGeol'79; PhD'83)**

**Edward E. WasseMiller (Geol'59)**



# Geological Sciences Faculty and Staff, 2023 - 2024

<https://www.colorado.edu/geologicalsciences/people/>

## Faculty

### Lon Abbott

Teaching Professor of Distinction  
PhD, University of California, 1993  
Earth Science Education

### Robert Anderson

Distinguished Professor  
PhD, University of Washington, 1986  
Geomorphology and Cryosphere

### Suzanne Anderson

Professor  
PhD, University of California, Berkeley, 1995  
Geomorphology and Cryosphere

### Leilani Arthurs

Associate Professor  
PhD, University of Notre Dame, 2007  
Earth Science Education

### Aaron Bell

Assistant Research Professor  
PhD, University of Nevada, Las Vegas, 2010  
Petrology, Microanalytical techniques

### Karen Chin

Professor  
PhD, University of California at Santa Barbara, 1996  
Paleontology and Paleobiology

### Alisha Clark

Assistant Professor  
PhD, University of California, Davis, 2012  
Petrology & Mineralogy

### Carolyn Crow

Assistant Professor  
PhD, University of California, Los Angeles, 2015  
Cosmochemistry & Planetary Geology

### Jaelyn Eberle

Professor  
PhD, University of Wyoming, 1996  
Paleontology and Paleobiology

### G. Lang Farmer

Professor  
PhD, University of California, Los Angeles, 1983  
Isotope geochemistry

### Rebecca Flowers

Professor  
PhD, Massachusetts Institute of Technology, 2005  
Geochronology, Structure and Tectonics

### Shemin Ge

Distinguished Professor  
PhD, The Johns Hopkins University, 1990  
Hydrogeology, Economic and Energy Resources

### Brian Hynek

Professor  
PhD, Washington University, 2003  
Cosmochemistry & Planetary Geology

### Craig Jones

Professor  
PhD, Massachusetts Institute of Technology, 1987  
Tectonics, Geophysics

### Sebastian Kopf

Associate Professor  
PhD, California Institute of Technology, 2014  
Geobiology, Geochemistry

### Kevin Mahan

Professor • Associate Chair of Graduate Studies  
PhD, University of Massachusetts at Amherst, 2005  
Structure and Tectonics

### Tom Marchitto

Professor  
PhD, MIT-Woods Hole Oceanographic Institution  
Joint Program, 1999  
Paleoclimate and Paleoceanography

### Bradley Markle

Assistant Professor  
PhD, The University of Washington, 2017  
Climate Indicators, Cryosphere, Paleoclimate

### Kathryn Materna

Assistant Professor  
PhD, University of California, Berkeley, 2019  
Geodynamics, Geophysics, and Remote Sensing

### Karl Mueller

Professor  
PhD, University of Wyoming, 1992  
Structure & Tectonics, Natural Hazards

### Irina Overeem

Associate Professor  
PhD, Delft University of Technology, 2002  
Geomorphology and Cryosphere

### Shaily Rahman

Assistant Professor  
PhD, Stony Brook University, 2016  
Biogeochemist and chemical oceanographer

### Vera Schulte-Pelkum

Associate Research Professor  
PhD, University of California San Diego, Scripps  
Institution of Oceanography, 2001  
Structure, deformation, rheology

### Julio Sepúlveda

Associate Professor  
PhD, Univ. Bremen, Germany, 2008  
Geochemistry, Paleoclimate and Paleoceanography

### Anne Sheehan

Professor • Department Chair  
PhD, Massachusetts Institute of Technology, 1991  
Geodynamics, Geophysics

### Carl Simpson

Assistant Professor  
PhD, University of Chicago, 2006  
Paleontology and Paleobiology

### Eric Small Tilton

Professor  
PhD, University of California Santa Cruz, 1998  
Hydrology, Geodynamics

### Katie Snell

Associate Professor  
PhD, University of California Santa Cruz, 2011  
Paleoclimate & Paleoceanography

### Jennifer Stempien

Teaching Associate Professor • Associate Chair of  
Undergraduate Studies  
PhD, Virginia Tech, 2006  
Earth Science Education

### Alexis Templeton

Professor  
PhD, Stanford University 2002  
Geobiology & Astrobiology

### Kristy Tiampo

Professor  
PhD, University of Colorado Boulder, 2000  
Geodynamics, Geophysics

### Lizzy Trower

Associate Professor  
PhD, Stanford, 2014  
Sedimentology & Stratigraphy

### Greg Tucker

Professor  
PhD, Penn State University, 1996  
Geomorphology and Cryosphere

### Boswell Wing

Associate Professor  
PhD, Johns Hopkins, 2005  
Geobiology & Astrobiology

## Support Team

### Kara Bajdas

Graduate Program Administrator, 2018-present

### Marilynn Bender

Accounting Technician, 2015-present

### Brett Burtok

Undergraduate Program Administrator, 2024-present

### Dan Mitchell

IT and Building Proctor, 1999-present

### Anne Marie Summers

Finance and Business Manager, 2022-present

## Research Associates, Postdocs and Lecturers

Jeffrey Benowitz, Research Associate

Valentine Combaudon, Postdoctoral Associate

Liam Courtney-Davies, Postdoctoral Associate

Eric Ellison, Senior Research Associate

Edgardo Flores, Postdoctoral Researcher

Ittai Gavriel, Senior Researcher

Daniel Gittins, Visiting Postdoctoral Fellow

Cedric Hagen, Postdoctoral Researcher

Jessica Hankins, Sr. Professional Research Assistant

Annika Horlings, Postdoctoral Scholar

Kristýna Kantnerová, Postdoctoral Researcher

Srishti Kashyap, Postdoctoral Associate

Alan Lester, Lecturer

Ashley Maloney, Research Associate

Lisa Mayhew, Research Associate

Gordon McCurry, Lecturer

Matt Mendoza, Postdoctoral Associate

James Metcalf, Research Associate

Stephanie Plaza-Torres, Geosciences Project Assistant

Catherine (Cat) Ross, NSF Postdoctoral Fellow

Mara Luisa Sanchez-Montes, Postdoctoral Researcher

William Shinevar, Postdoctoral Researcher

Pamela Stephens, Lecturer

Lennart van Maldegem, Lab Manager

Liannie Velázquez-Santana, Postdoctoral Associate

Emily Verplanck, Professional Research Assistant

Adam Younkin, Professional Research Assistant

Mengjie Zheng, Postdoctoral Associate

## Emeritus Professors

John Andrews

William Atkinson, Jr.

Roger Bilham

David Budd

Don Eicher

Alexander Goetz

Bruce Jakosky

Mary Kraus

Giff Miller

Stephen Mojzsis

Don Runnels

Joseph Smyth

Hartmut Spetzler

Charles Stern

Jaia Syvitski

Paul Weimer

James White



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## Peter Birkeland Geol Sciences Graduate Scholarship Fund

To provide graduate students in Geological Sciences at the University of Colorado Boulder funds for research and tuition.

## Bill Bradley Endowed Geology Support Fund

Designed to provide flexible support for the most urgent and impactful needs within the department.

## Bill Braddock Geology in the Field Endowment

To take students in Geological Sciences at the University of Colorado Boulder into the field to teach them field geology.

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Check, Credit Card or Cash

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Peter Birkeland Geological Sciences Graduate Scholarship Fund

Amt: \$ \_\_\_\_\_

Bruce Curtis Graduate Student Fellowship in Geological Sciences

Amt: \$ \_\_\_\_\_

Bill Braddock Geology in the Field Endowment

Amt: \$ \_\_\_\_\_

Bill Bradley Endowed Geology Support Fund

Amt: \$ \_\_\_\_\_

TOTAL: \$ \_\_\_\_\_

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