GEOLOGICAL SCIENCES
UNIVERSITY OF COLORADO BOULDER

Geology News

Linking River Ice to Bank Erosion in Arctic Rivers. page 16.
Cover photo: The Canning river and its bank erosion.

Editors:
Anne Sheehan
Dan Mitchell

Summer 2025

Letter from the Chair

Anne Sheehan

Dear Alumni, Friends, and Colleagues,

Greetings from the Department of Geological Sciences! I'm delighted to share the latest updates from our department.

This fall, we welcome two exceptional new faculty members. Professor Steve Jacobsen, a CU Boulder alumnus, returns to join us as professor of mineralogy. He comes from Northwestern University and brings expertise in mineral physics and materials science. Steve studies Earth and planetary materials under extreme conditions, and he will establish an interdisciplinary spectroscopy lab at CU. Professor Bethany Ehlmann is joining CU as the new Director of the Laboratory for Atmospheric and Space Physics (LASP) and Professor of Geological Sciences. Bethany has been on the faculty at the California Institute of Technology (Caltech) for the past 14 years, where she also directed the Keck Institute for Space Studies. Her research focuses on water in the solar system and planetary surface processes, using remote sensing and spectroscopy, and she has played key roles in numerous NASA missions. We are incredibly fortunate to be welcoming such accomplished scientists from top-tier institutions. Their expertise and leadership will further elevate our department and open up exceptional opportunities for our students.

Our faculty, staff, and students continue to receive well-deserved recognition. Some highlights: Professor Becky Flowers was named a Fellow of the Geological Society of America; Associate Professor Boz Wing received an Outstanding Graduate Mentor Award; Assistant Professor Carolyn Crow received an NSF CAREER Award; and a $1 million Keck Foundation grant was awarded to Associate Professor Lizzy Trower and Assistant Professor Carl Simpson. Carl was also promoted to Associate Professor with tenure this year. Our students continue to excel, with awards including NSF graduate fellowships, NASA FINESST, and multiple outstanding paper, poster, and research awards. See pages 24-29 of this newsletter for a full list of student awards. The number of undergrads involved in research was exceptional this year, with 20 undergrads participating in the Bruce Curtis Mentorship program and 17 students awarded grants or assistantships through the CU Undergraduate Research Opportunities (UROP) program (7 this year, 10 for the upcoming year). This level of undergraduate engagement wouldn't be possible without the dedicated research mentors and the invaluable guidance from Lon Abbott and Jen Stempien—thank you!

We are saddened to share the news of the passing of two of our emeritus professors this year, Don Eicher and Alex Goetz. Don Eicher started as an undergraduate transfer student at CU in 1952, received a PhD at Yale, and returned to CU to serve on the faculty from 1958-1995, including 5 years as department chair. Don's career focused on paleontology, stratigraphy, and geologic history, and he was known as a generous and supportive colleague. Alex Goetz joined CU in 1985 to establish the Center for the Study of Earth from Space (now ESOC) in CIRES. A pioneer in hyperspectral remote sensing, Alex worked previously at NASA, Bell Labs, and JPL. His contributions to the remote sensing of Earth and planetary surfaces continue to shape the field today.

This year saw a new department event - the "New Frontiers in Translational Geoscience" research conference, held in fall 2024. The event brought together students, faculty, alumni, and professionals for a day of posters and networking. Organized by a cross-departmental committee led by Associate Professor Leilani Arthurs, the event drew over 100 attendees, including 39 external geoscience professionals from a wide range of industries. Also under Dr. Arthur's leadership, the department held its second annual 'Earth Mysteries and Histories' Earth Day outreach event in April 2025. Over 200 visitors attended, and 57 volunteers pitched in to make this a great community event.

Our department continues to be supported by an exceptional team. Anne Marie Summers, Marilynn Bender, Kara Bajdas, and Brett Bertok keep the front office running smoothly, with help from undergraduate assistants Paige Herbert, Geneva Oestreich, and Ella Evans.

Looking ahead, I'm excited to announce that in Fall 2026, we will become the Department of Earth Science. This name change, unanimously approved by faculty, reflects the breadth of our research and teaching, aligning us with peer institutions across the country. The change is timed with the conversion at long last of our Bachelor of Arts to a Bachelor of Science degree. The new department name also fits perfectly with our home on campus, the Benson Earth Sciences Building.

In closing, I would like to send a heartfelt thanks to all our alumni and donors. Your support makes possible scholarships, field courses, student research, and the kinds of opportunities that define the CU experience. Especially now, your help connecting students with career paths and professional networks is more valuable than ever. We hope to connect with many of you at upcoming conferences, including IMAGE in Houston (August 2025), GSA in San Antonio (October 2025), and AGU in New Orleans (December 2025).

We love hearing from you—please stay in touch!

Warm regards,
Anne Sheehan
Chair, Department of Geological Sciences

The Front Office

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L-R: Marilynn Bender, Brett Bertok, Anne Marie Summers, and Kara Bajdas.

Greetings from the Alumni Advisory Board

by Penny Patterson

Geology Advisory Board Chair Penny Patterson.

June has arrived, signaling the close of CU Boulder's 2024 – 2025 academic year. I am honored to have served as Chair of the Advisory Board for the Department of Geological Sciences during this past academic year. And over this year, the Advisory Board has been working with the Geology Department, primarily focusing on student career opportunities and fundraising initiatives.

With the fluctuations in the job market and turmoil in government funding, our geology students have expressed keen interest in learning more specifically about various career opportunities in the field of geoscience. In response to this request for career information, the Advisory Board developed an easy-to-follow spreadsheet of High-Impact Careers (HIC) in geoscience, including a broad range of careers, such as enhanced groundwater recharge, remote sensing, economic geology of critical minerals, and engineering geology. The HIC spreadsheet includes additional information such as social impact, economic value, and a list of CU Geology Department professors conducting research in this career area. The spreadsheet also has links to pertinent websites for more information. Jennifer Stempien, Department of Geological Sciences Associate Chair for Undergraduate Studies, expanded the HIC spreadsheet to include relevant courses offered in the Geology Department for each career pathway. At the Spring 2025 Advisory Board meeting, Jennifer remarked that the HIC spreadsheet was a really great tool helping students assess their potential careers in geoscience.

A parallel effort with the Advisory Board's HIC spreadsheet was the Career Night event that was held by the Advisory Board in April 2025 for Geology Department undergraduate and graduate students. Joe Zamudio, Advisory Board member, did an outstanding job organizing the event. Joe presented the HIC spreadsheet to the students, which prompted lively and informative discussions on geoscience careers and also initiated post-meeting gatherings with students and Advisory Board members to further explain the various career options and opportunities.

Another Advisory Board initiative undertaken over this past academic year focused on fundraising strategies for the Geology Department. Patty Corbetta, Advisory Board member, worked with Bruce Geller, Geology Department alumnus, Anne Sheehan, Department Chair, and CU Advancement staff to develop a new Graduate Student Fellowship Fund in the Department of Geological Sciences honoring Professor Emeritus Bill Atkinson. The Bill Atkinson Fellowship Fund is accessible on the Geology Department website and has a wonderful video of Bill's former graduate students from around the world. It is extremely touching to hear the wonderful comments by the CU department alumni expressing their gratitude for Bill's teaching and mentoring excellence, and how Bill made such a positive impact on their lives. In addition, Bruce wrote a nice summary about Bill and the purpose of the fund. Please visit the website and see this wonderful and highly deserved tribute to Bill. The link to the website is: https://giveto.colorado.edu/bill-atkinson-graduate-fellowship-fund

Geological Sciences Advisory Board Members

Eric Anderson
USGS

Jacob Bauer
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Lisa Campbell
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Clara Chew
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Connor Newman
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Penny Patterson - Chair
Retired, ExxonMobil Exploration Company

Nadine Reitman
USGS

Sean Sundermann
Golden Geotechnics, Inc.

Joe Zamudio
Mineral exploration and remote sensing consultant

There are several other Endowed scholarships and Fellowship Funds for past professors in the CU Department of Geological Sciences. I hope that you will consider contributing to one or more of these wonderful giving opportunities to honor our CU Geology Department past professors and to support our CU geology students. For a list of gift opportunities. Please see https://www.colorado.edu/geologicalsciences/alumni/make-gift

This past year, Advisory Board members Hal Miller and Houston Kempton have elected to rotate off the Board. Hal and Houston have contributed greatly to the Advisory Board and the numerous geology department initiatives. We sincerely appreciate their valuable service and contributions to the Advisory Board and the CU Department of Geological Sciences during their tenure.

With much sadness, I must relay to you the news that the CU Geology Department has lost two great past professors this year. Professor Emeritus Don Eicher passed away in November 2024. For many years, Don led the stratigraphy and micropaleontology programs in the department. Professor Emeritus Alex Goetz passed away April 2025. Alex was a pioneer in remote sensing. He also served as a Fellow at CIRES and a Professor in the CU Geology Department. Both Don and Alex had profound impacts on the lives of many of our students, and they will be warmly remembered.

In closing, I am truly honored and humbled to share with you that in September, I received the 2024 University of Colorado Boulder Alumni Recognition Award. This is an extremely prestigious award that recognizes CU alumni for their "… dedication and service to the advancement of the university." I sincerely thank Professor Shemin Ge for nominating me for this prestigious award, and I extend a sincere thank you to the Geology Department and to all of you for your support over the years.

Sincerely, Penny Patterson

New Faculty

Steve Jacobsen

Steve joins the department in the fall of 2025 as our new professor of mineralogy. He blends materials science and physical chemistry to study Earth and planetary materials in extreme environments of pressure, temperature, radiation, redox, and other conditions found throughout the solar system. He is particularly interested in the role of minerals in cycling biocritical elements like H, C, and N, but also brings to the department futuristic applications of mineral sciences.

Jacobsen joins us from Northwestern University, where he has been on the faculty since 2006. He grew up in Denver, attending Arapahoe High School and going to the same University where his dad studied architecture ('71), CU Boulder. Steve's undergraduate in Geological Sciences ('95) was followed by a PhD in Geophysics ('01) with advisors and now faculty emeriti, Joe Smyth and Hartmut Spetzler.

At CU, Jacobsen will develop an interdisciplinary spectroscopy laboratory to study Earth and astromaterials, while also harnessing extreme conditions to develop functional materials with technological applications. His recent work has included electrodeposition of carbonates from seawater for coastline restoration, diamond semiconductors, co-discovery of a new rare earth mineral, goldschmidtite, and partnerships with industry and NASA to develop methods for construction on the lunar surface using regolith. Jacobsen will collaborate extensively with colleagues in LASP, especially the IMPACT laboratory, to explore new ways of simulating space weathering in minerals, essential to developing in situ resource utilization (IRSU) for offworld construction technology.

New Faculty ...cont.

LASP Director and Geological Sciences Professor Bethany Ehlmann

Dr. Bethany Ehlmann will join CU in Fall 2025 as the new Director of the Laboratory for Atmospheric and Space Physics (LASP) and Professor of Geological Sciences. Bethany joins us from Caltech, where she has been on the faculty since 2011. Bethany's research focuses on water in the solar system, the evolution of habitable worlds, and geologic and environmental processes using remote sensing techniques and instruments. She is particularly interested in chemical weathering and hydrothermal alteration and how infrared spectroscopic signatures at all scales from orbital to micrometer, inform processes and guide exploration.

When possible, Bethany gets into the field to study processes observed with remote sensing, and favors mafic to ultramafic or terrains that are planetary analogs (e.g., Iceland, Oman, Channeled Scablands, brine lakes of the Yilgarn Craton, Haughton Crater). She is a science team member of multiple space missions, including the Earth-orbiting EMIT imaging spectrometer, the Jupiter-bound Europa Clipper, the Mars Science Laboratory Curiosity rover, the Mars 2020 Perseverance rover, and the upcoming ExoMars rover. She is the principal investigator of Lunar Trailblazer, a NASA small satellite mission to study water on the Moon that launched earlier this year. Previously, she made key contributions as part of the science team for the Mars Reconnaissance Orbiter CRISM instrument, the Dawn mission exploration of the asteroid Ceres, and the Mars Exploration Rovers Spirit and Opportunity.

Bethany earned a bachelor's degree from Washington University in St. Louis, followed by two master's degrees from Oxford where she attended as a Rhodes Scholar. After returning to the U.S. for Sc. M. and Ph.D degrees in Geological Sciences from Brown University, she was a postdoc at the Institute d'Astrophysique Spatial in France before being hired at Caltech, where she spent 14 years on the faculty and 2 years as director for Caltech's Keck Institute for Space Studies.

This Fall, in addition to her appointment as Professor of Geological Sciences, Bethany becomes the director of the Laboratory for Atmospheric and Space Physics (LASP) and affiliate Professor of Astrophysical and Planetary Sciences. She looks forward to continuing her research and will have a lab focused on IR spectroscopy, including field-portable point and imaging spectrometers.

LASP Space Technology Building from above.

Faculty Activities, Research & Lab Reports

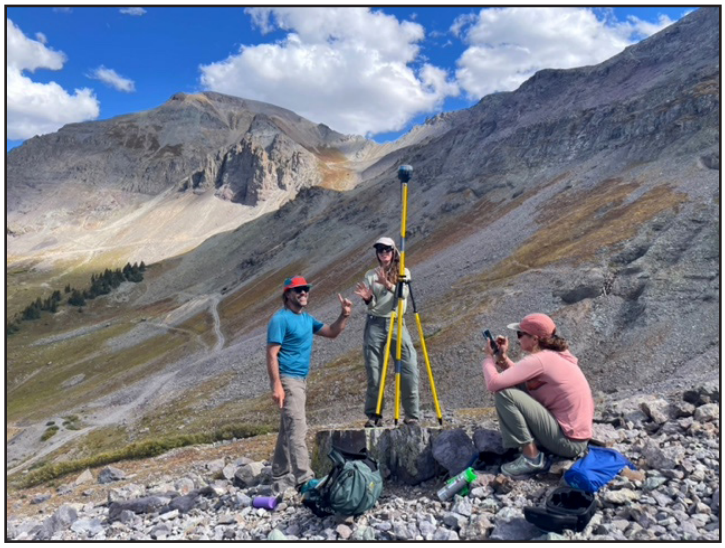
Dr. Robert Anderson and Dr. Suzanne Anderson

Team Rock Glacier, funded by an NSF grant to Bob Anderson and Suzanne Anderson, is beginning to solve some of the mysteries of rock glaciers. These boulder-covered bodies of ice dot our state's high alpine valleys as the main representatives of today's cryosphere. Looking like talus on the move, rock glaciers are short, rarely more than a kilometer long, and slow-moving, typically less than a meter per year. Pahoehoe-like transverse ridges and treacherous over-steepened margins are evidence of active flow. They live beneath tall rocky headwall cliffs that deliver necessary ingredients of snow avalanches and rockfall that allow these cryospheric bodies to form below the glacial equilibrium line altitude.

Focusing on Imogene rock glacier in the San Juan Mountains near Ouray (photo), grad students Juliana Ruef and Maya McDonough and undergrad Misha Toor have deployed cameras and temperature loggers and established GPS sites to document the thermal state and velocity field of the rock glacier. They plan to monitor local streams to document the fraction of water that comes from the rock glacier's ice core and are assessing its chemistry for further clues. Misha and Maya both presented their findings at the Cordilleran Section meeting of the GSA in Provo this summer. Misha's findings were also the root of her summa cum laude senior honors thesis, in which she argued that the odd and unique nitrogen isotopic chemistry of rock glacier derived water reflected its multiple phase changes between liquid water and ice. Maya's 14C-based dating of water showed that late summer seepage from Imogene rock glacier was thousands of years old.

Juliana took on the problem of "how to kill a rock glacier" for her Master's thesis, completed this May under the co-supervision of Brad Markle and Bob. Using a numerical model for heat transport in a column of snow, rocks, and ice, she asked what rock layer thickness is required to prevent ice melt, a condition necessary to the survival of the rock glacier. The annual cycle is complex, with snow that comes and goes, and the possibility of variable moisture levels in the rocky carapace. If the rock layer is too thin, the rock glacier will eventually die. If it is thick enough, the rock glacier can live for a long time.

So how do these rock glaciers work? Two new papers from the group tell some of the tale. The first, in JGR-Earth Surface, reports recent work on one of the Mt Sopris rock glaciers. Bob and postdoc Ben Lehmann brought modern tools to a question originally treated in the 1970s by the late CU Geology professor Pete Birkeland of the age of the rock glacier. Using 10Be on rocks on the surface to obtain the age structure, an approach Ben had first employed in the Alps, they showed that it has been operative since the early Holocene. They used feature tracking from satellite imagery to document the modern speed structure (maximum of 2 meters/year), and employed a numerical model of the rock glacier to match both of these constraints. Honed at Sopris, Team Rock Glacier is now employing the same toolkit on Imogene.



Part of Team Rock Glacier on Imogene rock glacier, San Juan Mountains. Left to right: Brad Markle, Misha Toor, and Juliana Ruef. Using RTK GPS to document cm-precision location of boulders in summer 2024, to be reoccupied in summer 2025 to obtain annual mean speed. The equipment was purchased with a generous donation from alumnus Bruce Manchon (Geol '79). (Photo by Suzanne Anderson)

The second paper out this year attempts to answer some fundamental questions about where and when rock glaciers form. In a paper published in Geology, Bob and Suzanne asked what is the recipe for making a rock glacier? (Side note: this is the first Anderson & Anderson journal article since 1990!) The title of the piece reveals the answer: "Lingering beneath crumbling cliffs: the origin of Holocene rock glaciers". Based on Juliana's results that a rocky layer about 2 m thick will suffice to protect the underlying ice core from melt, the question turns to the conditions required to generate a rocky layer that thick. The answer involves "just right" delivery rates of both rock and ice. Not surprisingly, the higher the erosion rate and the taller the headwall cliff, the greater the source of debris. And the slower the ice moves away from the cliff, the longer it will spend accumulating rock. Often, glaciers completely disappear before the sweet spot

in rock and snow delivery for a rock glacier is met. The required slow speeds combined with the ten thousand or so years since the rock glaciers formed explain the thin, short geometry of rock glaciers in Colorado's mountains.

Dr. Leilani Arthurs (GRASCE) Lab

In AY 2024-2025, the Geocognition Research for Advancing Science Education (GRASCE) Lab continued its efforts to advance geoscience faculty success and student success through its research, capacity-building, and community-building activities.

Six manuscripts were completed and submitted, one of which has been published, and the others are currently in different stages of review. These manuscripts were made possible with National Science Foundation (NSF) funding for the Promoting Research-based Instructional Methods to Enhance and Reform STEM Education (PRIMERS) Project (ended Sept. 2024). PhD candidate Holly Fortener worked on the PRIMERS Project and saw the publication of her first peer-reviewed journal article in Higher Education Studies. Having earned her doctorate, Holly graduated in May. She is currently on the market for positions involving teaching, curriculum development, and/or professional development in higher education.

L-R: Leilani Arthurs and Holly Fortener at the Spring, 2025 graduation celebration.

Much of the GRASCE Lab's efforts during this academic year revolved around the NSF-funded Connecting Our Unit through Relationships and Allyships in GEoscience (COURAGE) Project. Among other things, this project aimed to strengthen the GEOL Department's sense of community by developing and piloting annual events that members of the department would have a stake in, look forward to participating in each year, and help build a stronger departmental community that welcomes and supports all its members. These activities included the GEOL-Graduate-Program Informational Sessions for undergraduate students at nearby Coloradoan institutions of higher education, a campus-wide geoscience research conference, and a near-Earth-Day geoscience education and public outreach event.

The Informational Sessions attracted 30 participants from undergraduate programs at the University of Colorado Colorado Springs, the University of Denver, Colorado Mesa University, and Metropolitan State University of Denver. These informational sessions took place over Zoom in October and were made possible with the generous volunteerism of graduate student facilitators and faculty facilitators. One of the undergraduate students who attended an informational session also attended the geoscience research conference!

The geoscience research conference took place on November 9th, 2024. It was attended by 105 individuals, including 22 poster presenters and 39 geoscience professionals outside of CU Boulder. It was made possible by a volunteer team of 12 individuals who represented all member groups of the GEOL Department. Many presenters mentioned they appreciated the on-campus aspect of the conference, and more than one faculty member indicated they thought the conference provided excellent preparation for the upcoming AGU conference. Almost all who provided feedback about the conference thought it should be an annual event.

The near-Earth-Day geoscience education and public outreach event took place on April 26th, 2025. It was attended by at least 203 adults and children from nearby communities. It was made possible by 57 volunteers, who were members of the GEOL

Department, the CU Museum of Natural History, and also other departments (e.g., Physics). Many of these volunteers hosted one or more of the 10 interactive stations developed by GEOL Department members to target various geoscience concepts and phenomena, from ice cores to volcanoes to meteorites. Volunteers also hosted the Registration Desk and served as ushers and runners to help ensure visitors and volunteers were supported throughout the event. Many of the visitors and volunteers provided positive feedback about their experiences at the event, and almost all who provided feedback thought it should be an annual event.

The COURAGE Project, in AY 2024-2015, also helped support several CU Boulder geoscientists' efforts to build their capacity for conducting community-based climate-change-related research. Those who participated in a semester-long professional development program in fall 2024 and/or were awarded microgrants in spring 2025 to help fund their capacity-building efforts are included. The award recipients have until the end of July 2025 to utilize their awards.

The October informational sessions and November research conference were also made possible by the GRASCE Lab's intrepid Project Assistant Stephanie Plaza-Torres. After a year of working as our Project Assistant, she accepted a full-time position at the NSF in December 2024!

Dr. Jaelyn Eberle shares with participants at the Earth Mysteries and Histories Outreach Event hosted by the CU Museum of Natural History on April 26, 2025.

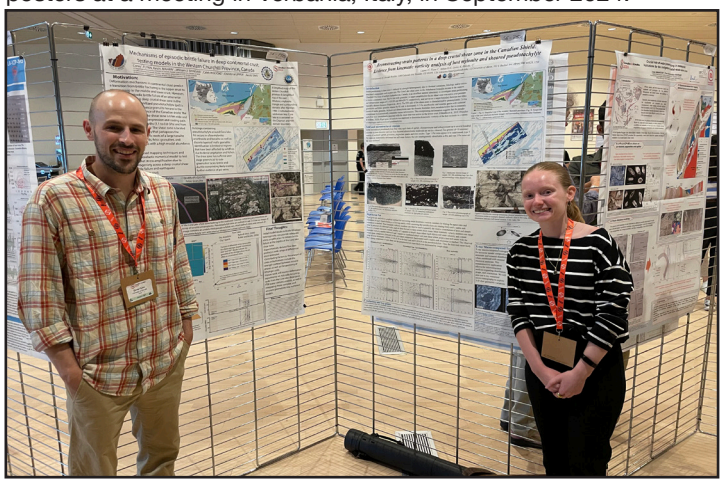
Dr. Jaelyn Eberle

Professor Eberle, also a curator at the University of Colorado Museum of Natural History, was awarded a Fulbright U.S. Scholar Award to conduct research at the Institute of Paleobiology, Polish Academy of Sciences in Warsaw this fall. Eberle will study the Cretaceous Mongolian mammal collection housed at the Institute of Paleobiology and compare it with coeval fossil mammals that she and her colleagues discovered on the North Slope of Alaska, in the hopes of identifying some of the earliest mammals to cross from Asia into North America via Beringia. Eberle will also team-teach with Professor Lucja Fostowicz-Frelik a graduate seminar on the Cretaceous-Paleogene boundary for the BioPlanet Doctoral School in Poland.

Dr. Kevin Mahan

Kevin Mahan's group continues to work on tectonics and deformation, and magmatic processes in continental crust, with ongoing projects in Saskatchewan, Canada, the Colorado Plateau and surrounding areas, Puerto Rico, and the Colorado Rockies. The Canada project is investigating the mechanisms responsible for earthquake nucleation in lower continental crust (Corey Flynn-2nd yr PhD student; Christina Lipper and Emma Marble-undergraduate students). The field site is in a remote part of northernmost Saskatchewan, where 2024 saw the first of two seasons of fieldwork (Corey and Jacob). Corey and Christina both presented their work on this project at the biennial Granulites and Granulites conference in Verbania, Italy in September 2024. Colorado Plateau projects are using xenoliths and shallow intrusions to address the effects of low-angle subduction on the overlying crust during the late Cretaceous to Eocene (Jacob Sims-2nd yr PhD; Tyler

Corey Flynn (PhD) and Christina Lipper (undergrad) presenting posters at a meeting in Verbania, Italy, in September 2024.



Undergraduate Lark Jones doing field work in Walker Ranch Open Space, Boulder County, CO in May 2025.

Wickland-5th yr PhD; Holly McCrory-undergraduate). Tyler presented his progress at a workshop in Flagstaff, AZ in Jul 2024 and Jacob presented at the annual AGU meeting in Washington, D.C., in Dec 2024. Work by postdoc Liannie Valasquez Santana (and undergraduate Julia Patascil) in Puerto Rico aims to better understand the construction of island arc crust by establishing petrogenetic connections between granitoid intrusions and hosted mafic enclave cargoes. Liannie and Julia presented their work at the annual GSA meeting in September 2024 in Anaheim, CA. Active projects in Colorado include an undergraduate Honors thesis by Lark Jones to explore possible connections between inherited Proterozoic structures and Laramide faulting in the Front Range.

Shaily Rahman and Claire Purananda field work on the R/V Pelican in the Gulf of Mexico, January, 2025.

Dr. Shaily Rahman

Dr. Shaily Rahman and grad student Claire Purananda sailed on the R/V Pelican in January 2025 to study the effects of Hurricane Francine on nutrient dynamics in the Gulf of Mexico. They conducted water column sampling and sediment coring to understand how extreme storm events affect macronutrient supply and sources. The photos show the Niskin rosette in action (collects water column samples from different depths), Claire drawing water column samples to analyze for nitrate concentrations and isotope signatures, and the team working on a sediment core. Storm-driven seabed resuspension and terrestrial runoff can shift nutrient biogeochemistry, potentially favoring harmful algal blooms (HABs) over the phytoplankton crucial for a healthy marine food web.

Shaily Rahman is handling the Niskin rosette during field work on the R/V Pelican in the Gulf of Mexico, January, 2025.

Dr. Kristy Tiampo

Dr. Tiampo currently has two undergrad research students working in her lab. Atticus Baker and Ryan Silknitter.

Atticus is developing a synthetic dataset of geodetic time series for volcanic regions, using both actual time series from Hawaii and computational volcanic models. This research project uses Python-based computer programs, high-performance computing, and statistical analysis. The initial time series are being constructed from existing GNSS (Global Navigation Satellite System) and InSAR (Interferometric Synthetic Aperture Radar) data sets, augmented by known deformation patterns produced from numerical models of volcanic processes. This synthetic dataset will be used as training data for machine learning algorithms (MLAs) for forecasting processes and eruptions in active volcanic regions.

Ryan began working with postdoctoral fellow Dr. Brie Corsa to learn high-resolution InSAR (Interferometric Synthetic Aperture Radar) processing

and has been working on image analysis for Hawaii and Niwot Ridge. His efforts are designed to better understand and quantify the effects of snow and precipitation on the data and results. He has processed additional InSAR data for several snow-covered regions, with the ultimate goal of characterizing that snow and its snow-water equivalent (SWE). This will include testing snow/SWE models to derive more accurate InSAR data and compare those with GNSS (Global Navigation Satellite System) data.

Dr. Greg Tucker

Greg Tucker was on sabbatical during 2024, devoting part of the year to academic visits and conferences in Europe (plus a visit to the famous K-Pg site near Gubbio, Italy), as well as a writing retreat in the Pacific Northwest. Nonetheless, the Computational Geomorphology Lab had a busy year. Last summer, PhD student Vanessa Gabel (now alumna—congratulations, Dr. Gabel!) published a journal article exploring some of the fascinating consequences of a long-recognized geologic process: the wear of cobbles as they are carried downstream along a mountain river (Gabel et al., 2024). Working with a mathematical model of river-profile evolution that she developed, Vanessa found that the rate of cobble abrasion has a surprisingly powerful influence on stream profile shape and landscape relief.

Working on a smaller space-time scale, postdoctoral researcher Yuval Shmilovitz published new work that explores how the frequency magnitude of rainstorms can influence soil erosion and landform evolution in dryland environments (Shmilovitz et al., 2025). It turns out that fluctuations in the relative frequency of rare but powerful convective storms can have a big influence on soil erosion rates, potentially driving rapid gully formation in settings like the Colorado High Plains.

Meanwhile, Greg continued to oversee the Community Surface Dynamics Modeling System (CSDMS; https://csdms.colorado.edu), together with Irina Overeem and colleagues in INSTAAR and CIRES. CSDMS is an NSF-supported facility that provides software, computing tools, educational resources, and engagement opportunities for the earth-surface geoscience community. The 2025 CSDMS Annual Meeting, on the theme of "Exploring Earth's Surface with Models, Data, and AI", took place on east

Monument to Nicolas Steno, a.k.a. Niels Steensen, Copenhagen. (Photo by Greg Tucker)

campus last May, attended by about 150 participants from around the world. The CSDMS Landlab package, developed at CU Boulder by the Computational Geomorphology group, reached a new milestone: the software has been used in over 100 published studies to date. CSDMS is always looking for contributions to its activities and resources—please contact Greg or Irina if you're interested in getting involved or learning more.

Publications:

Gabel, V., Tucker, G. E., & Campforts, B. (2024). A mathematical model for bedrock incision in near-threshold gravel-bed rivers. Earth Surface Processes and Landforms, 49(13), 4168-4186.

Shmilovitz, Y., Rossi, M. W., & Tucker, G. E. (2025). Multi-century erosion and landscape evolution of ephemeral catchments in response to sub-daily rainfall distribution changes. Geophysical Research Letters, 52(5), e2024GL113179.

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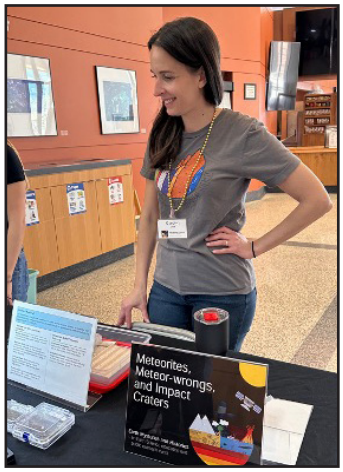
instagram.com/cubouldergeology/

Faculty Awards

Fulbright U.S. scholar award
Dr. Eberle will be spending Fall 2025 at the Institute of Paleobiology, Polish Academy of Sciences in Warsaw as a Fulbright scholar.

Promoted to Research Assistant Professor
Aaron Bell



NSF CAREER Award, 2024
Carolyn Crow

Geological Society of America Fellow, 2024
Awarded to Rebecca Flowers for her groundbreaking work linking geology and thermochronology, which has deepened our understanding of the geologic history of continental regions

American Federation of Mineralogical Societies Honoree
Kevin Mahan

Received tenure and promotion to Associate Professor
Carl Simpson

Keck Foundation Grant
Awarded to Lizzy Trower and Carl Simpson for research in testing the role of extreme climate in early animal evolution

CU Graduate School 2024-2025 Exceptional Graduate Faculty Mentor Award
Boz Wing

Undergraduate research (UROP) mentor awards:
Alta Howells
Kevin Mahan
Kathryn Materna
Lizzy Trower

Introducing the Hal and Jenifer Miller Endowed Fund for Geology

The Department of Geological Sciences is proud to announce that the first awards from the new Hal and Jenifer Miller Scholarship were made this year, marking the beginning of a meaningful legacy of student support. Created by CU Boulder alumnus Hal Miller (MS '79) and his wife Jenifer, the scholarship reflects their deep commitment to education and the geosciences. Hal earned his master's degree in geology at CU and has remained actively involved with the department through the advisory board. After a distinguished career at ConocoPhillips, he became president and principal owner of Subsurface Consultants & Associates, LLC.

The scholarship provides support for undergraduate and graduate students in the department, with a preference for first-generation college students. Awards may include scholarships, stipends, or research opportunities, and are renewable based on university criteria. The department is deeply grateful to the Millers for their generosity and vision in helping shape the future of geoscience education.

Book Signing Honors Bruce and Marcy Benson

The photo below was taken at the March 19, 2025, reception at the Denver Country Club celebrating the launch of the biography *Bruce Benson: Oilfield Roughneck to University President* by Ken McConnellogue.

The new book chronicles Bruce's upbringing on a World War II–era farm outside Chicago, his time working on drilling rigs in Wyoming, the founding of his own oil and gas company, and his 11-year tenure as president of the University of Colorado. Bruce Benson (Geol '64), an esteemed alumnus of our department, and his wife Marcy, a highly respected civic leader and advocate for education, have been instrumental in advancing the department's mission. Their generous support includes the Benson Earth Sciences Building and the Marcy H. and Bruce D. Benson Graduate Fellowship Fund, which helps us recruit top graduate students and sustain our global excellence in the geosciences.

Front row (L to R): Suzanne Anderson, Bruce Benson, Marcy Benson. Back row: Anne Sheehan, Bob Anderson, Shemin Ge.

Save the Date(s)

for CU alumni events at Geoscience Conferences this year!

IMAGE 2025 (SEG/AAPG), Houston, TX
Wednesday, August 27, 2025.
All-alumni reception, 5:30-7:30 pm
Marriott Marquis Hotel in Houston, Houston Ballroom 3 on level two
near the George R. Brown Convention Center.
Please reach out to geoloffice@colorado.edu to be put on our contact list for this event.
The reception is open to CU Geological Sciences alumni in the Houston area as well as department alumni and current department members attending the IMAGE conference. You do not need to be registered for the IMAGE conference to attend the alumni reception.

GSA Conference, San Antonio, TX
Monday, October 20, 2025, 7-9:30 pm. Alumni group reception. Grand Hyatt San Antonio River Walk.
Please email geoloffice@colorado.edu to be put on our contact list for GSA.
The reception is open to CU Geological Sciences alumni in the San Antonio area as well as department alumni and current department members attending the GSA conference.

AGU, New Orleans, December 15-19, 2025.
CU Alumni event is TBD.
Please email geoloffice@colorado.edu to be put on our contact list for AGU.

In The Field

GEOL 4725 was primarily focused on mapping mass movements and flood deposits in response to extreme events. Students were collecting channel geometry data, setting up timelapse cameras, performing infiltration experiments, collecting stratigraphic pit data, and bathymetric data in one of the gravel pits that Boulder Creek had breached.

Corey Flynn and Jacob Sims building the boat.

Dr. Kevin Mahan's research group spent the season "in the field" far north in Saskatchewan in an exhumed lower crustal shear zone. The shear zone is part of a vast exposure of the lower crust known as the Athabasca granulite terrane and is located in the western Churchill province of the Canadian Shield. Within the field area, there is evidence that earthquakes were occurring at roughly 35-25 km paleodepths in the form of a solidified frictional melt-related rock called pseudotachylyte. Earthquakes are typically not observed at these depths, and so they would like to know why. The goal of their fieldwork was to document pseudotachylyte occurrence, map lithologic variation in the shear zone, and collect samples for analysis, such as rock deformation experiments. Data collected from fieldwork will be used to model stress amplification in the lower crust due to lithologic heterogeneity as well as to estimate earthquake source parameters.

Pseudotachylyte "fossil earthquake".

Kevin Mahan, Corey Flynn, and Jacob Sims collecting samples.

GEOL-4716/5716 Environmental Field Geochemistry.

Field Tectonics in the Sierras

On The Cover: Linking River Ice to Bank Erosion in Arctic Rivers

by Irina Overeem

We were just dropped off by the helicopter along the banks of the Canning River. The pilot has shut down the machine, and it sits bright red in the flat and soggy tundra. We are far north in Alaska, in the vast Arctic National Wildlife Refuge. For a long way, it is just us, in the territory of a huge caribou herd, some Arctic foxes, wetland birds, and perhaps a traveling wolf pack? We are in one of the main distributary channels in the Canning delta, only 15 km from the Arctic Ocean. It is a cold, misty day, even now in August 2024.

By now, we have seen the Canning River up and down. The first summer fieldwork in 2022, our research team rafted downstream from the Brooks Range and sampled along the entire gravely river corridor to the coast. That summer, we followed the main flow through the larger distributary channel branch, the Staines River. We found icy riverbanks being melted and undercut by river water. This time in 2024, we landed on the other important deltaic distributary channel, the original Canning River branch.

Rafting down the Canning River, Marisa Repasch and Josie Arcuri handle the front paddling. The rafts carry us and our research equipment and are our sampling vessel at the same time (Photo: I. Overeem).

This NSF-funded project involves three professors of our department, Bob Anderson and Suzanne Anderson, and I, studying the geomorphology, carbon dynamics and sedimentary processes. Dr. Marisa Repasch is quantifying the geochemical cycles, and two graduate students, Josie Arcuri and Cole Cochran, work on river ice and soil carbon, respectively. The project aims to assess how Arctic River corridors in the continuous permafrost zone are changing. Measurements over recent decades

Taking measurements of peaty and icy riverbanks being thermally eroded in the Canning delta (photos Overeem and Repasch).

show Arctic River flow has increased and permafrost is slowly thawing. But how exactly these changes impact the geomorphological and geochemical processes is less clear –Is there increased sediment and carbon transport? Is riverbank erosion faster? Is more old organic matter mobilized and transported through the river corridor?

We ask these questions because scientists are recognizing that thawing permafrost and a deepening active layer expose long-frozen organic matter to microbial decay. Microbes release carbon dioxide and methane, greenhouse gases to the atmosphere, which then in turn cause more permafrost thaw. This is called the permafrost-carbon feedback mechanism. The estimated stock of carbon stored in permafrost is huge; ~1400-1600 Pg of carbon, roughly twice as much as currently contained in the atmosphere. Arctic River corridors, wetlands and deltas, just like elsewhere in the world, are often thought of as hotspots of carbon production, release, and sequestration. Here, we set out to get a better quantitative understanding of these dynamics in a river and delta in the northernmost region of Alaska, the Arctic National Wildlife Refuge. One aspect of the project looks at rapid bank erosion. Bank erosion is considered ‘abrupt thaw’, it exposes carbon along the entire depth of the bank, which would potentially release even more carbon than just slow permafrost thaw from heat conduction into the subsurface

At our drop-off site, Bob collects data on the freezing front in the soil. We measure this by poking a temperature probe into the soil; it typically hits frozen soil within 50-60 cm. And we collect sediment samples from the floodplain to analyze grain size and organic carbon content back in the labs at CU.

Marisa and I measure the river velocity and depth by paddling an Acoustic Doppler Current Profiler across the channel. Even from looking at the channel from the bank, we already know, the volume of water is very low on this day. But the heaps of sticks perched high on the riverbank (see the cover photo) indicate floodwater level has been much higher previously in the season.

Over earlier measurement campaigns, we found that riverbanks in the Canning delta are locally rich in ice, up to 60% ice. Graduate student Josie Arcuri developed a numerical model that uses meteorological and hydrological data to calculate river water level and temperature, to then quantitatively predict how permafrost riverbanks are thermally eroded and collapse into the main delta distributary channel. However, we noted that predicted erosion seemed to be faster than observed bank erosion from remote-sensing mapping. This discrepancy highlighted that river ice was an important additional part of the story.

Maybe we should not have been surprised – we were awed in our first year by the vast expanses of river ice. River ice forms over the entire winter from small seepages and can accumulate to as thick as 3m. Time-lapse cameras and pressure sensors indicate this river ice takes months to melt and break up in May-June. Its presence in one part of the delta channel network steers snow melt floodwater into the other main distributaries. That is why the sticks are perched on the bank in the 'abandoned' Canning channel; it was really floodwater-filled when ice was blocking the other channel.

Our numerical model now incorporates this river ice effect. Model results suggest that the persistence of river ice in distributary channels nonlinearly impacts permafrost bank erosion by blocking river discharge to certain branches, heightening water level across the delta, and locally limiting river water warming.

Raft traveling through vast river ice accumulations in Late June 2022 (photo I.Overeem).

Bruce Manchon Equipment Gift

GEOL 4716 Environmental Field Geochemistry students test water quality and pH of H2O discharging from a rock glacier near the Continental Divide in Handcart Gulch, CO, in October 2024.

Thanks to alumnus Bruce Manchon (Geol '79) for his generous donation of advanced field equipment now being used in several of our Geological Sciences field classes. The equipment includes an RTK GPS system used in the Field Geophysics class taught by Craig Jones, and also supporting a wide range of field research (see photo on p. 7 of the RTK GPS gear in action on a rock glacier near Ouray), two Hach DR900 Colorimeters for the Environmental Field Geochemistry class taught by Alexis Templeton, and a Geotech Geosub2 pump for use in the Field Geohydrology class taught by Gordon McCurry. Access to this state-of-the-art equipment significantly enhances our students' hands-on learning experiences in the field.

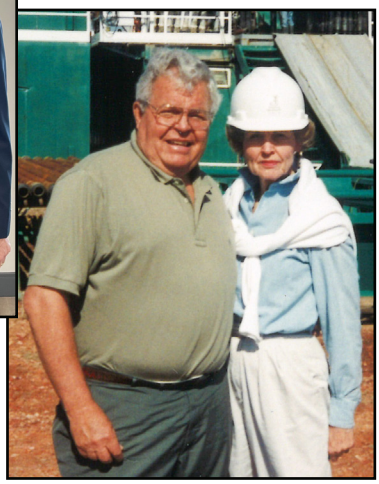
Field Geohydrology class conducting aquifer pumping test at East Campus wellfield. The measurements of water level decline (drawdown) in wells during the aquifer pumping test are used to determine hydraulic properties of the aquifer.

Celebrating 50 Years of the T. Keith Marks Scholarship

This year marks the 50th anniversary of the T. Keith Marks Scholarship, a fund that has profoundly shaped the lives and careers of students in the Department of Geological Sciences. Established in 1975 by T. Keith Marks, a CU Boulder alumnus (CU '56) and pioneering petroleum geologist, the scholarship has since grown into a vital source of support for both undergraduate and graduate students. Keith's passion for geology and exploration was matched by his deep connection to the university, where he earned degrees in Architectural Engineering and Business before pursuing graduate studies in geology. After his passing in 2002, his wife Patty Marks, and later their children Steve and Stacey, and daughter-in-law Mara, continue to grow the fund and steward its mission. Today, the Marks family works closely with the department to support students whose academic interests align with the oil and gas industry, and whose personal stories reflect resilience, curiosity, and commitment.

Over the decades, the Marks Scholarship has become more than financial support—it has become a lifeline and a launchpad. Undergraduate recipients often balance rigorous coursework with jobs and family responsibilities, while graduate students pursue cutting-edge research in fields ranging from sedimentology and isotope geochemistry to tectonics and paleontology. Many recipients have expressed how the scholarship eased financial burdens, allowing them to focus on their research, complete their degrees, and take the next steps in their careers. Whether commuting long distances to campus,

Steve Marks and Stacey Lemcke at the Marks Oil 50th anniversary celebration, October 2024.



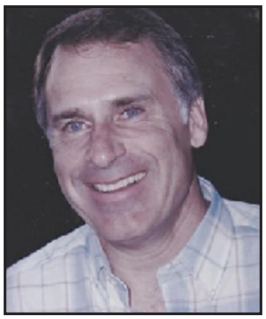
Keith and Patty Marks at a North Dakota drilling site in the early 1990's.

Keith and son Steve Marks at a Denver Basin drilling site circa 1980.

conducting fieldwork in Death Valley or Montana, or preparing for postdoctoral fellowships, these students carry forward the legacy of Keith Marks: a belief in the transformative power of education, and a passion for discovery.

As we celebrate this milestone, we honor not only the generosity of the Marks family but also the enduring impact of their vision. The scholarship continues to support students whose work contributes to our understanding of Earth's processes and resources, just as Keith did throughout his career. The Department of Geological Sciences is deeply grateful for this partnership and looks forward to the next 50 years of empowering future geoscientists.

Craig Canon Memorial Endowed Field Work Support Fund



The Craig Canon Memorial Fund was established to honor the beloved memory of Craig Canon (Geol '61). Craig attended CU and received his degree in Geology before going on to have a successful career in finance and entrepreneurship. Craig valued giving back to his community and improved the lives of many. In commemorating his inspirational life and passions through this memorial fund, the Donor's hope is to support future students pursuing Geological field work. By supporting these students and their futures, this gift celebrates Craig's remarkable spirit and profound legacy.

Distributions from the Fund will be used to provide support for field work in the Department of Geological Sciences within the College of Arts and Sciences at the University of Colorado Boulder. The Fund will provide flexible resources for advancing strategic initiatives, strengthening core offerings, and addressing the Department's greatest needs.

Outreach project by the CU TRaIL: SNODASE (Students of Northglenn Date Ancient Snowball Earth)

by Cullen Kortyna

This spring 2025, the CU TRaIL (Thermochronology Research and Instrumentation Lab) launched the first year of SNODASE (Students of Northglenn Date Ancient Snowball Earth), a multi-year educational outreach collaboration between TRaIL and Northglenn High School. SNODASE is a problem-based learning curriculum designed to expose high school students at Northglenn High School to cutting-edge geochronologic and geologic research, including key aspects of the scientific process such as research question/hypothesis development, geochronology methodology, and the application of geochronologic data towards solving geologic problems. The development and execution of SNODASE was spearheaded by TRaIL research associate Dr. Cullen Kortyna and Northglenn High School geology teacher Kent Hups, and it was funded as part of an NSF award to Drs. Becky Flowers and Jim Metcalf.

For the first year of SNODASE, Cullen and the students of Northglenn performed detrital zircon U-Pb dating on the Tava sandstone of Boulder Canyon, an enigmatic metasandstone dike that crosscuts the Boulder Creek granodiorite. Research on other Tava dike localities indicates that the sandstone was originally deposited on the ancient Coloradoan landscape during the Neoproterozoic and was subsequently injected deep into weathered granitic bedrock by fluid overpressure caused by overriding ice sheets during Snowball Earth. Detrital zircon U-Pb dating can constrain the original timing of deposition of the Tava sandstone, as well as tell us the Tava sandstone's sedimentary provenance—which bedrock sources were at the surface and eroding to provide sediment to the rivers that deposited the sandstone.

To perform the problem-based learning, Cullen visited Northglenn High School to introduce the project, Snowball Earth, and detrital zircon U-Pb geochronology. Kent also worked the geology of the Tava sandstone into his high school geology class curriculum. In March, Cullen took Kent and five highly motivated Northglenn juniors and seniors on a field trip to Flagstaff Mountain and Boulder Canyon to learn about the geology of the Front Range and collect a Tava sandstone sample for detrital zircon geochronology. These students then took the Tava sandstone sample to the department's SamPLER (Sample Preparation Lab and Educational Resource) facility and performed the initial mineral separation steps including jaw crushing and disc milling to break the rock sample down into sand, and Wilfley water tabling to separate the denser minerals (including zircon) from the less dense minerals in the sand sample. Cullen then video recorded both the subsequent mineral separation steps and the detrital zircon U-Pb analysis so that the students could follow the process virtually. Cullen visited Northglenn High School again in April to share the detrital zircon U-Pb results and provide initial geologic interpretations of the data.

The Northglenn students then had several weeks to interpret the data and assemble poster presentations on the SNODASE Tava sandstone detrital zircon project. Posters were presented by the students in three sessions to a panel of Northglenn High School teachers and CU Earth Science researchers (Drs. Lon Abbott, Catherine Ross, and Kortyna), who judged the posters and provided feedback. The poster session was a success as students demonstrated their understanding of the project, the methodology, and the geologic implications of the results while learning important presentation skills. Many students expressed their enthusiasm and excitement to have participated in this research collaboration, and two students even expressed their newfound desire to apply to CU Boulder for their undergraduate education.

With the first year of SNODASE in the rear-view mirror, Cullen, Kent, and the rest of TRaIL look forward to expanding the material, scope, and student participation opportunities of year two of SNODASE starting in the fall of 2025!

Northglenn students and Cullen standing on the unconformity between the Permian Fountain Formation and the Boulder Creek granodiorite on the March 2025 field trip.

Inspiration through Geology: Teaching Humanities and Social Sciences with Maps

by Ilene Raynes, Map Library Program Manager, Jerry Crail Johnson Earth Science & Map Library

How can geology students reach their peers in the humanities who do not have much exposure to Earth science? Sam Cartwright, a third-year PhD candidate who studies the geology of Mars' south pole, worked with the Earth Sciences & Map Library to address this gap by being a guest curator for a new exhibition and an instructor for class visits that incorporated its content. The exhibit weaves together three explorations of Topophilia, or the love of place, including work by two Colorado-based artists, Rita Vali and Johanna Mueller.

Nine classes incorporated the exhibit into their instruction sessions during the academic year 2024-2025. As curator, Sam scoured the vast collections of the library to select maps that employ different methods to capture the shape and beauty of landscapes on the printed page. These maps vary from depictions of the mountains surrounding the walled cities of 19th-century China, to meanders of the Mississippi River and even alien landscapes at the final frontier of space exploration. Sam also provided instruction on planetary nomenclature (how map features in space are named) and led a class studying China's exploration of space through an interactive history of planetary cartography. Students in humanities classes such as "Spanish in the United States" and "Visualizing International Affairs" were able to apply familiar concepts such as image analysis and data visualization (which are relevant to their areas of study) to a broader introduction of cartographic techniques and the fundamentals of geology.

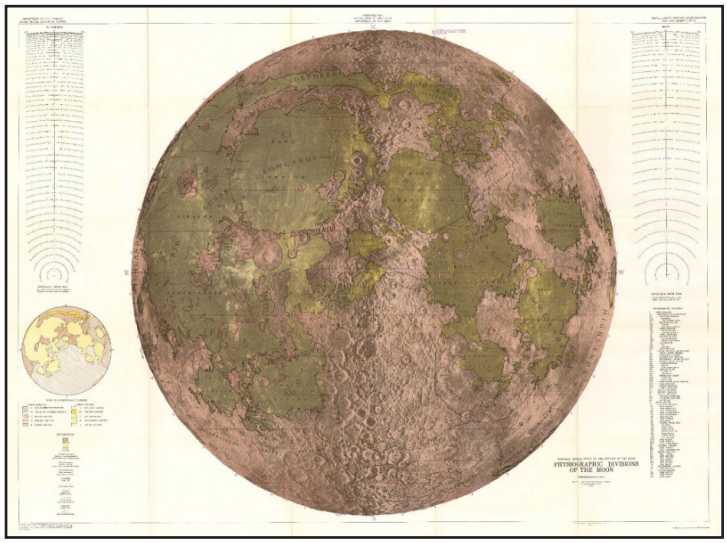
Meeting a graduate student who can speak to cross-disciplinary interests created obvious student enthusiasm for the content of their classes. Perhaps some of these students will even be inspired to investigate geology class offerings!

IN PULL-OUT BOXES:

"It was a fun challenge to find ways to connect each class to the exhibit. For a class on the role of the Spanish language in U.S. society and institutions, we pulled out a selection of maps of the American Southwest and discussed how Spanish place names reflect and shape the identity of that region. It can seem like a big leap to pull space into that discussion, but in that case, I focused on the international organization in charge of setting official names for objects in space. Just like on maps of Earth, these names reflect particular histories or cultures and ultimately shape the connection we feel to distant landscapes." - Sam Cartwright, PhD candidate, co-curator of the Topophilia exhibit

"Sam Cartwright's session with my China's Space Dream class was a true highlight of the semester and an exceptional example of cross-disciplinary teaching. Sam encouraged students to think critically about how landscapes, both real and imagined, shaped scientific ambition and our ideas about the universe beyond Earth. He also worked hands-on with students when we visited the Topophilia exhibit and examined maps at the Map Library." - Dr. Lauren Collins, Program Director and Teaching Assistant Professor, Asian Studies

Topophilia is an art and map exhibition that explores "love of place" and is on view now until August 2025 at the Earth Sciences & Map Library.



This map featured in the Topophilia exhibit is part of the first detailed study of the geology of the Moon, which was published in 1961. Each of the physiographic provinces shown here was assessed for its engineering and exploration potential at a time when the construction of permanent lunar bases felt inevitable. Early maps like this were essential in developing the study of planetary geology and continue to shape the field to this day.

Earth Mysteries and Histories' Earth Day outreach event, April 2025

The Department of Geological Sciences, in collaboration with the CU Natural History Museum, hosted the second annual Earth Mysteries and Histories outreach event on April 26, 2025. The event welcomed over 200 visitors and was made possible by the incredible efforts of 57 volunteers. Guests of all ages enjoyed a variety of interactive stations and engaging earth science activities designed to spark curiosity and celebrate our planet. The photos below highlight some of the hands-on learning and fun that made the day a success.

Student Activities/Awards

Geology club @Benson L-R: Lark, Anya, Jaxon, Atticus, Julia.

Geology club NCAR field trip, Sept. 2024.

Geology club Walstrum Quarry trip, March 2025.

Geology Club Awards - 2024-25

Huge thank you to:

President – Anya Keena

Vice President – Atticus Baker

Secretary – Jaxon Bartell

Treasurer/Social Media Manager – Julia McCutcheon

Trip Planner – Lark Jones

For a wonderful and productive year in the Geology Club.

Geo Club Awards (Presented at Award Ceremony)

Undergrads

Field Fashionista – Lark Jones

Acid Boy/Girl Award – Hunter Frith

Rock Shop Royalty – Christina Lipper

Grads

GIS Genie – Wolfgang Lopez

Most Magmatic Personality – Bri Hibner

Best Older Sibling – Juliana Ruef

Chillest TA – Tyler Wickland

Faculty

Most Heinous Lab Project – Sedimentology and Stratigraphy Core Project

Most Epic Field Class – Field Seminar in Western Tectonics - Craig Jones

Best Research Highlight – Lon Abbott

Best Chalk Talk – Alisha Clark

Coffee Connoisseur and Bagel Baron – Brett Bertok

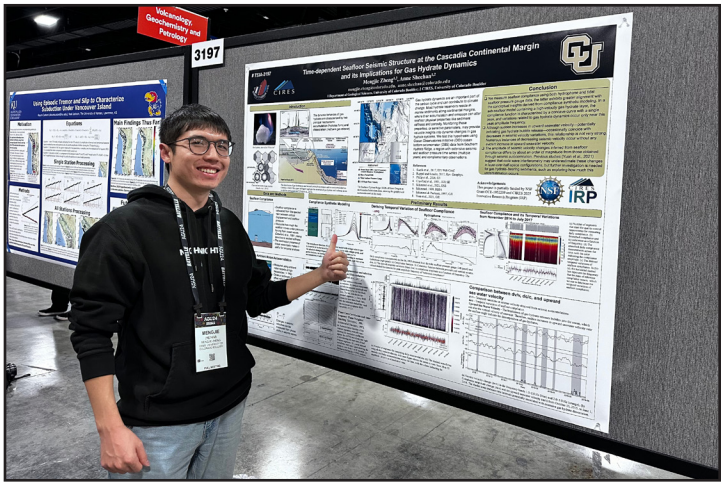
CU students attending the Banff Geobiology conference.

by Jim Gutoski

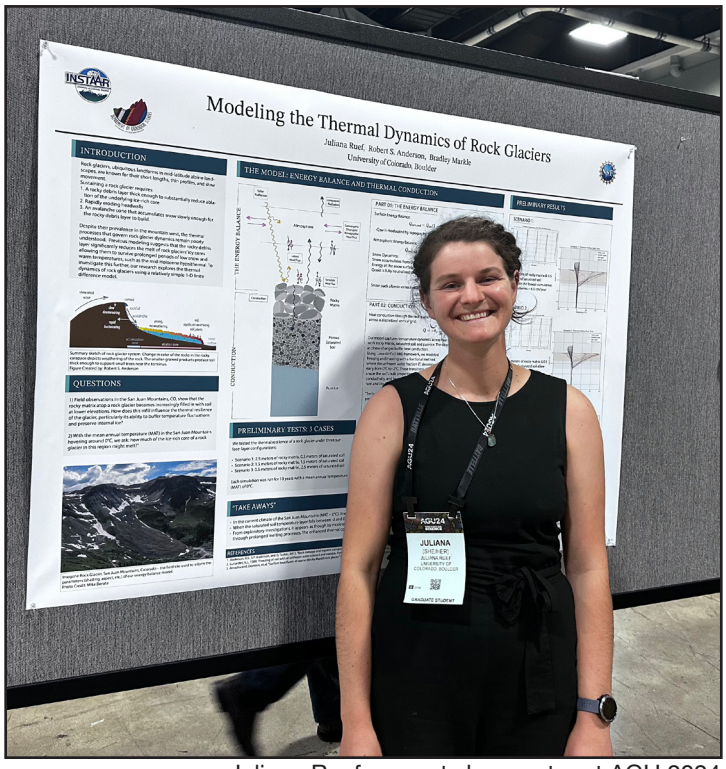
L-R: Elliott Mueller, Liam Friar, James Gutoski, Catherine Fontana, and Andrea Halling in Banff.

In May 2025, CU graduate geology students participated in the 3rd Geobiology Society Conference in Banff, Alberta, themed “Tracing the Biosphere Through Time.” This conference gathered a global community of geobiologists to explore the complex interplay between life and the planet over vast timescales. The University of Colorado Boulder was well-represented, with every CU participant presenting their findings. Remarkably, CU researchers secured two out of the six awards for Best Lightning Talks, an excellent acknowledgment of the significant contributions from CU’s geology department. James Gutoski and Catherine Fontana both received Geological Sciences Graduate Fellowships for their travel, and James was fortunate to be awarded a departmental travel and research grant. This funding significantly impacted the ability to fully participate in the conference, present research, and network with international peers. The conference was truly remarkable, hosted in a stunning location that provided an inspiring backdrop for scientific dialogue and collaboration.

AGU 2024, Washington, D.C.

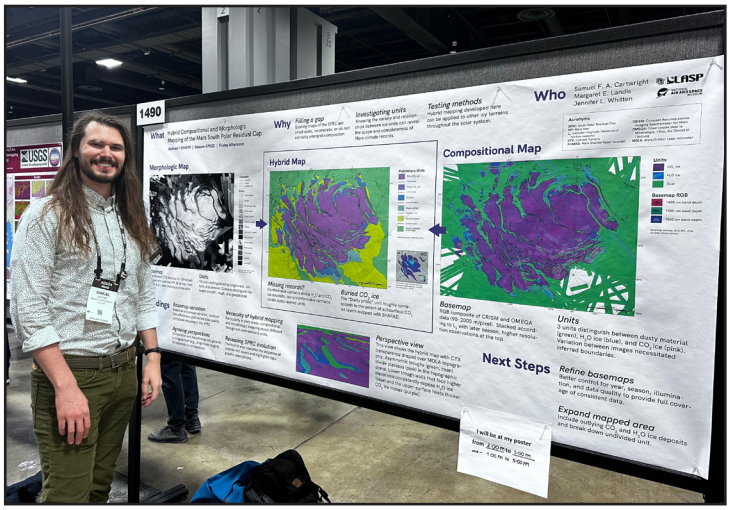


Mengjie Zheng presents his poster at AGU 2024.



Juliana Ruef presents her poster at AGU 2024.

Sam Cartwright presents his poster at AGU 2024.



Your generous support helps support student conference travel. Thank you!

Undergraduate Research Opportunities Program (UROP) Grants 2024-2025

Ryan Flat
Faria Khan
Holly McCory Scott
Julia Patacsil
Grant Peterson
Jill Rinaldi
Misha Toor

Undergraduate Research Opportunities Program (UROP) Grants 2025-2026

Rylan Abel
Ashley Askins
Colleen Ewald
Amelia Fonda
Amelia Gandhi
Lark Jones
Anya Keena
Emma Marble
Kalpana Murugan
Aspasia Vazquez

GSGA Bowling Night - L-R: Anne Sheehan, Kathryn Materna, Vera Schulte-Peckum, Leilani Arthurs, Taran Renfrow, and Israel Carrillo.

Bruce Curtis Mentorship Program

Mentee	Year	Mentor	Research Project
Amelia Fonda	Senior	Tom Marchitto	Stable isotope stratigraphy and paleoceanography of marine sediment core RC8-78, Chatham Rise, New Zealand.
Amelia Gandhi	Senior	Vera Schulte-Pelkum	Mapping volcanotectonic fabric in the Alaskan and Aleutian arc
Ashley Askins	Senior	Halina Dingo	Investigation of Seismic Hazard in Port Angeles, WA, using Vs30 values obtained by DAS
Atticus Baker	Senior	Kristy Tiampo	Development of synthetic training data for volcanic ML applications
Colleen Ewald	Junior	Melia Kendall	Tracking the origin and early evolution of water in rocky planet interiors
Emily Kimball	Sophomore	Paloma Siegel	Re-measuring water isotope ratios on an historic Greenland Ice core
Emma Marble	Junior	Irina Overeem	Disentangling Arctic sediment transport mechanisms from grainsize distributions
Faria Khan	Junior	Ashley Maloney	Carbon and Oxygen Isotopes of Saurischian and Ornithischian Eggshells to Reconstruct Body Temperature and Paleoclimate
Jill Rinaldi	Sophomore	Brad Markle	Expanding the Climate Record of the Juneau Icefield to 1948 through Digitization of Physical Climate Data
Julia Patacsil	Junior	Liannie Velázquez-Santana	Geochemical Analyses of the Utuado Pluton, Puerto Rico
Kaylyn Hughen	Senior	Shaily Rahman	Impacts of extreme storm events on biogeochemical P cycling in deltas
Lark Jones	Senior	Kevin Mahan	The potential for pre-Laramide inheritance in the Livingston fault, Boulder County, CO

Bruce Curtis Mentorship Program ...cont.

Mentee	Year	Mentor	Research Project
Mark Irby-Gill	Senior	Shemin Ge	Baseflow contribution to Streamflow in the Upper Colorado River Basin
Misha Toor	Senior	Juliana Ruef	Nitrate Dynamics in Rock Glacier Outflows: A Study from Colorado's San Juan Mountains
Reilly Kaczmarek	Senior	Jordan Herbert	Field validation of machine learning based snow depth and snow water equivalent maps
Rylan Abel	Junior	Rhys-Jasper Leon	Analyzing Water Isotopes in a Greenland Ice Core
Sang Lapinee	Senior	Kathryn Materna	Study of viscoelastic properties of the mantle of Salton Trough after 2010 El Mayor Cucapah earthquake
Shelby Opp	Senior	Brianna Hibner	Sediment stabilization "superpower" of microbial mats: bidirectional flume erosional experiments using microbial mat cultures from Little Ambergris Cay
Sophia Peters	Freshman	Karl Mueller	Structural and Geomorphic Analysis of a Newly Recognized Active Fault System - San Diego, CA
Taran Renfrow	Junior	Lon Abbott	Determining the Cenozoic exhumation history of the Boulder/Lyons area using apatite (U-Th)/He thermochronology

Denver Geophysical Society Student challenge bowl
Rocky Mountain Section Champions

Soren Rollin
Atticus Baker

NSF Graduate Fellowship

Shelby Opp

Rocky Mountain Association of Geologists
Neal J. Harr Award

Juliana Kelley

Undergraduate Scholarships

T. Keith Marks Undergraduate Scholarship

Rylan Abel
Faria Khan
Tanner Premeaux

Phillip George Worcester Endowed Scholarship

Hassan Al Shihab

Kenneth Allen Johnston Memorial Scholarship

Atticus Baker
Amelia Gandhi

Stephen H. Evans Undergraduate Scholarship

Helena Calegari Biscoula

GSGA Bowling Night - L-R: Soren Rollin, Lark Jones, and Tyler Wickland.

Donald L. and Marilyn R. Gustafson Endowed Undergraduate Scholarship

Kayden Couse
Cain Purdy

Marco J. DeMarco Scholarship

Reid Goldstein

Marc & Doris Kolber Scholarship

Anya Keena

Graduate Awards

Jeffrey A. Deen Memorial Scholarship (2023-24)

Amanda Alexander
Robert Kelleher
Ethan Pierce
Tristan Caro
Liam Friar
Harp Batther
Harry Brodsky
Bri Hibner
Harry Allbrook
Haley Brumberger
Catherine Fontana
Trish Tellez
Earl White
Laurel Bayless
Indigo Heine
Amy Vodopyanov

Jeffrey A. Deen Memorial Scholarship (2025-26)

Paige McDowell

American Federation of Mineralogical Societies Scholarship

Amy Vodopyanov
Tyler Wickland

ARCS organization (Achievement Rewards for College Scientists) 3-year scholarship

Laurel Bayless

Colorado Scientific Society student grant award (best MS proposal)

Maya McDonough

Top Student Poster, International Kimberlite Conference

Spencer Ziegler

2024 GSA Structural Geology and Tectonics Outstanding Student Research Award

Corey Flynn

NASA FINESST

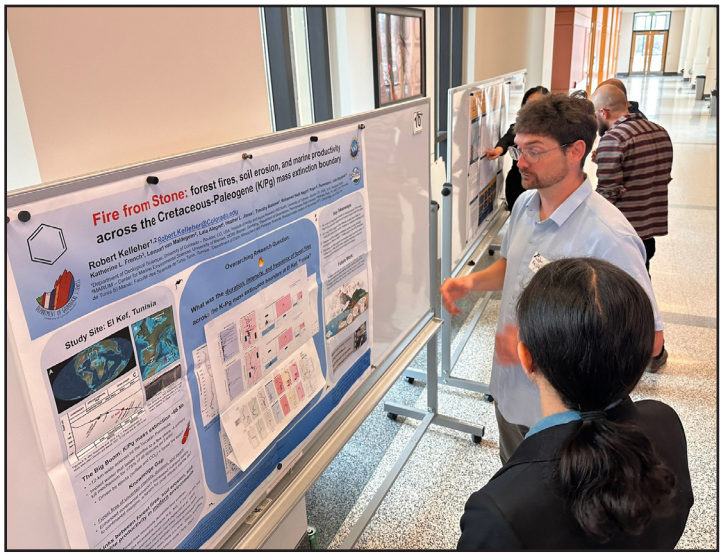
Quelyn Hayes

CIRES Graduate Student Research Award

Joel Johnson

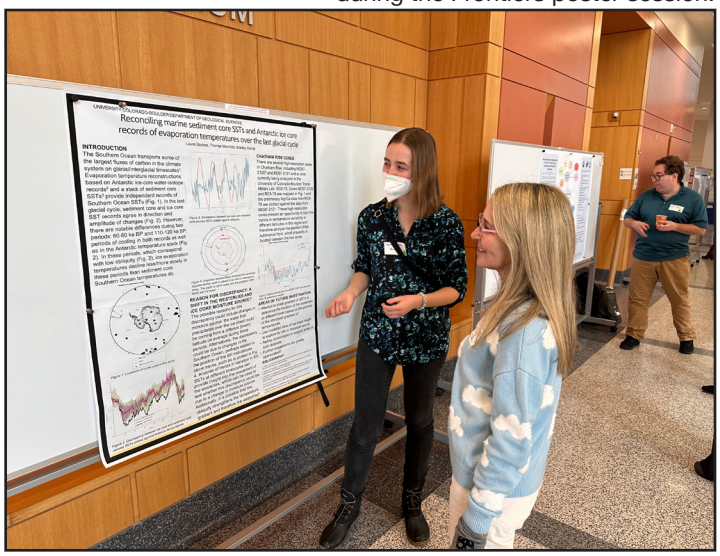
INSTAAR Sarah Crump Graduate Fellowship

Juliana Ruef



Robert Kelleher discusses his poster at the Frontiers poster session.

Lauren Bayless shares details of her work during the Frontiers poster session.



Graduate School Summer Fellowship

Tyler Wickland

National Association of Geoscience Teachers Outstanding TA Award (NAGT)

Wolfgang Lopez

Stephen H. Evans Graduate Scholarship

Harry Allbrook
Haley Brumberger
Connor Antonio-Diaz
Ashlee Stratton
Tricia Tellez

T. Keith Marks Graduate Scholarship

Corey Flynn
Jim Gutoski
Tyler Lincoln

Henry A. Waldrop Scholarship

Catherine Fontana
Jacob Tidwell
Tyler Wickland

Dr. John D. Edwards Geological Sciences Scholarship

Bri Hibner
Olivia Stanley

Timothy William Stanton Scholarship

Leon Rhys-Jasper

Miller Endowed Fund for Geology

Tyler Lincoln

Bruce F. Curtis Scholarship

Maya McDonough
Spencer Shaw
Sierra Weirens

Marcy H. and Bruce D. Benson Graduate Fellowship

Holly Fortener
M. Morrow Tan
Lindsay Harrison
Jacob Sims
Jordan Herbert

Great group of graduate students who participated in the Frontiers poster session.

Night at the Museum.

Penny E. Patterson Graduate Endowed Research Fellowship Fund for Geological Sciences

Juliana Reuf
Corey Flynn
Haley Brumberger

Peter Birkeland Geological Sciences Graduate Scholarship Fund

Sierra Weirens
Harry Allbrook
Robert Kelleher

Marcy H. and Bruce D. Benson Graduate Fellowship, Research Award

Jim Gutoski

Colorado Groundwater Association Harlan Erker Memorial Scholarship

Sierra Weirens

Wallace Rush and Mary Oswald Griffitts Endowed Graduate Memorial Scholarship

Paloma Siegel

Spetzler Family Fund

Laurel Bayless

Graduate Fellowship in Geological Sciences

Tyler Wickland

Spring 2025 Geology Graduation Ceremony.

Fall 2024 Travel Awards

Bri Hibner
Josie Acuri
Holly Fortener
Stephanie Tkacik
Wolfgang Lopez
Corey Flynn
Christina Lipper
Julia Patacsil
Tyler Lincoln
Jordan Herbert
Haley Brumberger
Spencer Ziegler
Juliana Ruef
Jacob Sims
Corrine Liu
Vanessa Gabel
Halina Dingo
Lindsay Harrison
Ethan Pierce
Catherine Fontana
Harry Allbrook
Que Hayes
Rhys-Jasper Leon
Laurel Bayless
Tyler Wickland

Spring 2025 Travel Awards

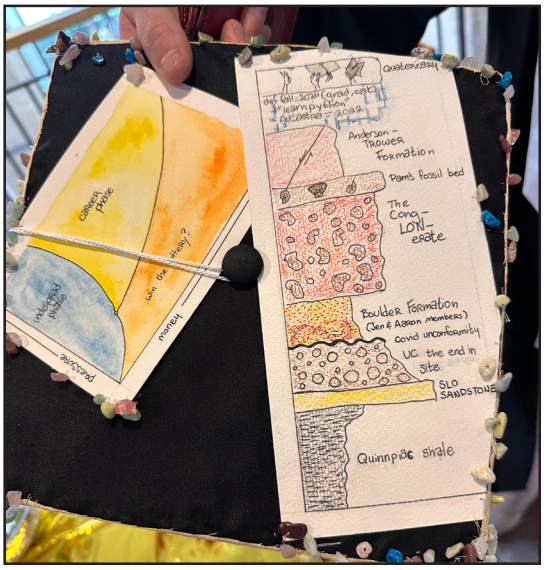
Jim Gutoski
Harp Batther
Connor Antonio Diaz
Kevin Rozmiarek
Ashlee Stratton
Liam Friar
Maya McDonough
Trish Tellez
Nicole Mizrahi
Spencer Zeigler
Israel Carillo
Catherine Fontana
M. Morrow Tan
Sierra Weirens

Spring 2025 Geology Graduation Ceremony.

Degrees Awarded (Fall 2024- Spring 2025)

BA Geology Majors

Elizabeth Bissell
Brett Busi
Sydney Ciechanowicz
Desiree Liza Dsouza
Ryan Flat
Dante Golash
Michael Gross
Grady Nicholas Grudzinski
Mark Irby-Gill
Tyler Howe
Kaylyn Hughen
Reilly Kaczmarek
Juliana Grace Kelley
Sang Lapinee
Allison Larsen
Christina Hope Lipper
Joelle Ashleigh Macke
Shelby Nycole Opp
Ashley Parkhurst
Julia Patacsil
Erik Perez
Grant Peterson
Zuri Rose
Colin Scott
Nowell Sinicki
Misha Toor



A geo-themed mortar board.

Undergraduates Graduating with honors

	Advisor(s)	Thesis
Sydney Ciechanowicz *magna cum laude*	Dr. Brian Hynek	The Effects of Temperature and pH on Microbial Biodiversity in Martian Analog Laguna Fumarólica, Costa Rica.
Ryan Flat *summa cum laude*	Dr. Lizzy Trower	Insights into Microbialite Mineralization from Microbialite Clasts in Great Salt Lake.
Kaylyn Hughen *cum laude*	Dr. Shaily Rahman	Hurricane Impacts on the Phosphorus Cycle.
Juliana Kelley *summa cum laude*	Dr. Paul Hayne, APS	Investigation of Uncertainty Related to the Detection of Silica Nanograins in Saturn's E Ring.
Sang Lapinee *summa cum laude*	Dr. Kathryn Materna	Study of late postseismic viscoelastic properties below Southern California after the 2010 El-Mayor Cucapah earthquake.
Shelby Nycole Opp *magna cum laude*	Dr. David Brain	The Relationship Between Magnetic Reconnection and Aurora Detections in the Ionosphere of Mars.
Zuri Rose *cum laude*	Dr. Aaron Bell	The Pre-eruptive Conditions of the Two Buttes Lamprophyre.
Misha Toor *summa cum laude*	Dr. Suzanne Anderson	Regional Variation in Nitrate Content of Rock Glacier Outflow.

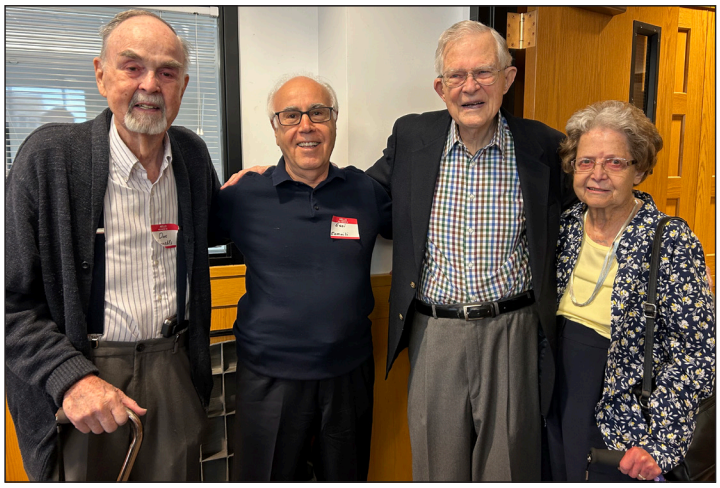
MS Candidates Graduating with Degrees

	Advisor(s)	Thesis
Halina Dingo	Dr. Anne Sheehan	On the Use of Distributed Acoustic Sensing in Vs30 Seismic Hazard Microzonation: A Case Study in Port Angeles, Washington.
Corrine Celupica-Liu	Dr. Shemin Ge	A Numerical Modeling Approach to Quantify Groundwater Discharge from a Perennially Frozen Alpine Aquifer under Warming.
Lena Joan Nyblade	Dr. Eric Small Tilton	Assimilating Airborne Lidar Snow Depth Data to Improve Basin-Wide Snow Estimates Across Seasons and Years
Juliana Ruef	Dr. Robert Anderson Dr. Bradley Markle	Thermal Controls on Rock Glacier Stability: Modeling the Effects of Insulating Debris and Climatic Forcing.
Stephanie Marie Tkacik	Dr. Jaelyn Eberle	A new study of the Florissant fauna and its diversity.

PhD Candidates Graduating with Degrees

Harpreet Batther	Dr. Alexis Templeton Dr. Sebastian Kopf	The Applications of Methanogen Stable Carbon and Hydrogen Isotope Biosignatures.
Jennifer Reyné Davis	Dr. Carolyn Crow	Influence of Impact and Ejecta Environments on Planetary Geochronology.
Abby Eckland	Dr. Irina Overeem	Reservoir Sedimentation and Delta Dynamics Across Scales.
Holly Fortener	Dr. Leilani Arthurs	The Influence of Teaching-Focused Professional Development Programs on Undergraduate STEM Instructors and STEM Education Transformation.
Vanessa Jean Gabel	Dr. Greg Tucker	Evolution of Mixed Bedrock-Alluvial Rivers and Applications to Neogene Landscape Evolution of the High Plains, Colorado, USA.
Naomi Ochwat	Dr. Ted Scambos Dr. Robert Anderson	From Antarctic Sea ice unleashing glaciers to Alaskan icefalls releasing ogives: Investigations of glacier processes using remote sensing, field data, and numerical modeling.
Juliana Olsen-Valdez	Dr. Katie Snell Dr. Lizzy Trower	Global- and local-scale environmental change in an ancient high-elevation lake basin; carbonates and microbialites from the latest Cretaceous to middle Eocene Sheep Pass Formation, Nevada, USA.
Ethan Pierce	Dr. Irina Overeem	From bedrock to bergs: sediment entrainment beneath glaciers and ice sheets.
Amanda V. Steckel	Dr. Brian Hynek Dr. Amanda Hendrix	Developing Techniques to Assess the Habitability Potential of Ancient Mars and Beyond.

William “Bill” Atkinson honored at 6/17/25 Luncheon by Bruce Geller (Ph.D. 1993)



L-R: Emeritus Professor Don Runnels, Dr. Essi Esmaili (PhD ‘83), Emeritus Professor Bill Atkinson, Carol Atkinson.
(Photo by Essi Esmaili)

In November 2024, Patty Corbetta and I began discussions with the department and the CU Advancement Office about creating a lasting tribute for Professor Emeritus Bill Atkinson, who served on the CU Geological Sciences faculty from 1978 to 2004. During Bill’s 26 years on the faculty, he mentored roughly 50 graduate students, plus numerous undergraduates, and was an incredible advisor. After many Zoom meetings, Patty (another of Bill’s advisees) and I launched the William W. Atkinson Graduate Student Fellowship Fund. We reached out to many people whose lives were touched by Bill’s career and invited them to take part in honoring Bill’s legacy.

To establish the funding for this new student support fund, Graeme Hundley from the CU Boulder Advancement Office created a crowdfunding website and a campaign to raise awareness of the new fund. The page went live in late April and dozens of donors have contributed to the campaign as of writing this (late June 2025). The website is: https://giveto.colorado.edu/bill-atkinson-graduate-fellowship-fund.

To celebrate Bill’s career and the creation of the new gift fund, the Geological Sciences department organized and hosted a luncheon in Bill’s honor in June 2025. The planning committee reached out to as many of Bill’s former advisees and other professional contacts as possible, but sometimes contact information was not available or incorrect. Apologies if you missed!

Roughly forty people, including alumni, faculty, and Bill’s family, gathered in the Benson Earth Sciences building to celebrate with Bill at the luncheon on June 17, 2025. We were joined by Bill’s former colleagues and advisees from all over the country and the continent, including Alex Iriondo, who joined us by Zoom from Mexico, and Essi Esmaili, who flew in from California. Brief remarks were made by Department Chair Anne Sheehan, former Department Chair Don Runnells, former Advisory Board member Fred Barnard, Bill Eberle, Bill Atkinson, former Geological Sciences Rock Shop supervisor Paul Boni, Carol Atkinson, and Bill’s advisees Essi Esmaili, Sara Martinez, Patrick Williamson, Patty Corbetta, and Bruce Geller. Patty created a video containing photos and remarks that Bill’s students submitted of their experiences working with Bill. As Patty told me, “It was a marvelous team effort, all because we care so much about Bill.”

The committee thanks Anne Sheehan and the department for the wonderful event, which was followed by a tour of the Benson Earth Sciences building. This was a rare chance to mingle with Bill, his faculty and professional colleagues, and numerous advisees. In short, it was a very special event that could not have gone any better. Seeing the joy in that room and hearing all the buzz confirmed how much everyone was positively impacted by the time spent learning from Bill. The genuine outpouring of support by past students, current and past faculty, and staff was palpable.

Patty’s, Anne’s, and Graeme’s help made the Fund and Luncheon possible. I do not know how I would have reentered the mining industry were it not for Bill’s guidance and mentorship, and I will long cherish this opportunity to honor his storied career. If you would like to honor someone who made your studies at CU extra special, I strongly encourage you to speak with Anne Sheehan or Graeme Hundley.

If you wish to donate to the Fund after the crowdfunding website expires this summer, please send your check payable to **University of Colorado Foundation** to University of Colorado Foundation, P.O. Box 561690, Denver, CO 80256-1690, and indicate on the memo line that it is meant for the William W. Atkinson Graduate Student Fellowship Fund. **Online donations can be made by clicking the donate button on the department web page and navigating to the Bill Atkinson Graduate Fellowship Fund.**

Bruce Geller speaking at Bill Atkinson luncheon, June 17, 2025.

Emeritus/Alumni News

Emeritus Professor **Harmut Spetzler** and son Andrew are on an extended trip in the West. They had breakfast at the Jacob Lake Inn near the North Rim of the Grand Canyon.

Photo by Hartmut Spetzler.

James Kirkland, Ph.D. '90

With more than 25 years as Utah's State Paleontologist, I can say I have been hunting dinosaurs for more than 50 years, naming my 24th, Coahuilasaurus a couple of weeks ago, with several more in the works. I have been trying to focus on the Lower Cretaceous of eastern Utah, documenting the newly recognized mass extinction of Euramerica's famed Upper Jurassic Dinosaur fauna, and I have been beating the drum for a "Dawn of the Cretaceous Fossil Beds NM." You did not hear that here.... For those that remember me, I still play in the marine Cretaceous realm, and am currently revising the nomenclature for the Mancos on the Colorado Plateau, raising it to a group. Come to our symposium and field trip at the 2025 Rocky Mountain GSA or forever hold your tongue. I just got selected for Utah's Gov. Cox's 2024 Governor's Award for Excellence (GAFE), but even at 70, no time to retire as there are too many geological tales to tell. (Ph.D. Geology, 1990)
Hoping everyone is well and having fun!

Caleb Bailey BA 2016

It's good to hear from you guys! I miss the school a lot, I wanted to say thanks for some of the best teachers I've ever had the chance to learn from, some of friendliest people I've ever met and some of the most interesting topics and applications of science I've had the chance to do at the time in my life.
I might need some help on some projects coming up. I'm looking to go to ETH Zurich or maybe do grad at CU Boulder if I don't think ETH will work out. I'm looking to do a PhD in education at the same time and look into bridging the gap between the financial industry and geoscience more than I've already done. If you guys ever want someone to come and talk about brownfields and applying geology to do some really cool aspects of helping communities and local governments, let me know!
Thanks and much love.

Tim Thompson, Geology/Physics '82

I was sad to hear of the loss of Ed Larson. He taught our field geology class in the summer of '82. We were using a portable magnetometer somewhere in the field, and someone read out the measurement, "24", or something. Another student asked what the units were, but no one knew, and Prof. Larson wasn't there to tell us. So we arbitrarily decided to call the units "Larsons". Another student then asked if we could convert those "Larsons" to "Eds".
Because Prof. Larson wasn't a very big guy, we decided there had to be a lot of "Eds" in one "Larson."
Good times and a great professor. I'll miss him.

Peter Clark, Ph.D. '84

Congratulations to CU alum and Oregon State University Distinguished Professor of Earth, Ocean, and Atmospheric Sciences Peter Clark, newly elected Member of the U.S. National Academy of Sciences! Peter's CU advisor was Dr. John Andrews.

We want to hear from you too...

@

GeoAlum@Colorado.EDU

You can also fill out the short form on our website!

https://www.colorado.edu/geologicalsciences/get-involved/alumni/alumni-updates

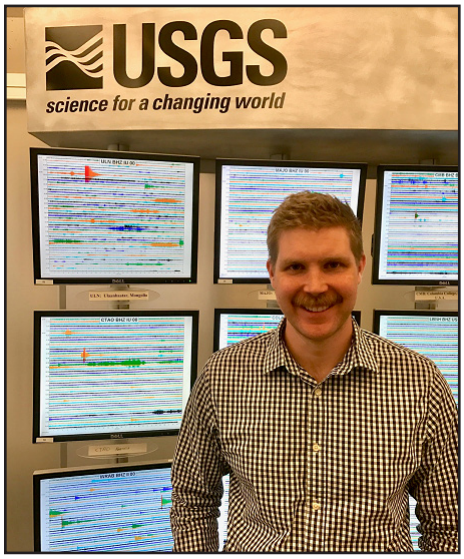
Congratulations to **Penny Patterson** (Geol ’76, MS ‘81, PhD ‘90) for receiving the 2024 University of Colorado Alumni Recognition Award, which honors CU Boulder alumni who have demonstrated extraordinary leadership, commitment, dedication, and service to the advancement of the university and its mission. Dr. Patterson was also recognized as one of “Houston’s 50 Most Influential Women of 2024”. The list recognizes women who have made significant impacts in various fields, including business, philanthropy, and academia.

Friends, faculty, and alumni gathered to honor Penny Patterson at the 2024 Annual CU Alumni Awards Ceremony and Dinner, held during Homecoming Week.

Congratulations to PhD Alumni **Will Yeck** (PhD ’15) and **Harrison Gray** (PhD ’18) on each receiving the Presidential Early Career Award for Scientists and Engineers (PECASE) in January 2025.

Will Yeck is a research geophysicist with the U.S. Geological Survey in Golden, Colorado. Will’s research focuses on real-time detection and characterization of earthquake sources and characterization of earthquake sequences for long-term hazard assessment.

Harrison Gray is a research hydrologist with the U.S. Geological Survey in Denver, Colorado. Harrison works on problems associated with landscapes and sediment transport using tools of computer landscape evolution modeling and luminescence.



Will Yeck

Harrison Gray

Want to check out older Geology News editions? Scan the QR code below

Do you have Geology News editions from the 1970s and 1980s? We would love to get copies.

In Remembrance

Dr. Don Eicher

Professor Emeritus Dr. Don Lauren Eicher passed away on 3 November 2024 at age 93, in Boulder, CO. He was born in Lincoln, NE, in 1930 to Edith and Clayton, an only child who, delighted to find himself on planet Earth, decided he wanted to study it.

He met Audrey Weese as a substitute in a bridge game while he was an undergraduate in geology at the University of Colorado; they married shortly thereafter. He received his Master's from CU and his PhD from Yale. Applying for a teaching position in Missouri -- not Audrey's first choice, but as an academic paleontologist, he had to go to where the jobs were -- he asked a former professor at CU for a recommendation. "Come teach at CU instead," came the reply, which he did, with immense joy, for the next 40 years.

He was a Professor in the CU Department of Geology (now Geological Sciences) from 1958 – 1993, and after retirement in 1993, continued to teach part-time in the department until 1998. He also served as Department Chair from 1975 – 1980.

Don and Audrey, each other's alpha and omega, adventured widely and in the course of time acquired two children by various means, Alisa and Clay, who survive him. After the earthquake of Audrey's untimely passing after more than 3 decades of marriage, he married Valerie Heffron, to whom he was also married, also over 3 decades. Valerie was his polar opposite, yet each was better with the other than alone, the definition of a dynamic system in balance. Via Valerie, he acquired three stepchildren, Ian, Mark, and Sarah, and a step-granddaughter, Maya. Mark predeceased him. Valerie passed away earlier in 2024.

Don became a pilot in 1949, at the age of 19, when planes were truly dangerous and therefore appealing to young men with wanderlust and a technical bent. He later qualified for a commercial pilot's license at the age of 82; his instructor thought he might be the oldest person ever to obtain a commercial pilot's license, which he had no intention of using. But it was a good chance to brush up on his skills and, more importantly, show any doubters that he was still more than capable of flying in his 80s.

His time on earth was human, but his sense of time was geological, a subject about which he even wrote a book, called simply, "Geologic Time". He also wrote a textbook for use in introductory geology classes and many articles about the movements of oceans, based on the study of the fossils of tiny organisms that floated in the water column. He identified several new species, including a foraminifera which he thought looked like 2 lovely intertwined strings of pearls, so he named it "Bimonilena", Latin for "double necklace".

Surfacing after his first time SCUBA diving -- he got certified to dive in his 60s -- he said excitedly, "That was just like going back in time a hundred million years." This was quintessential Don: both a unique reaction -- has anyone before him likened SCUBA diving to time travel? -- and a display of professional expertise: he knew enough about the earth's historic environments to recognize one when, to his surprise, he actually saw it.

He kept in his office a copy of the drawing done by the great Scottish geologist James Hutton of Siccar Point, where, in 1795, Hutton discovered geologic time. Hutton realized that, as he wrote, the world has "no vestige of a beginning, no prospect of an end." The universe itself is an unending series of processes.

And now Don is returned via these processes and to the elements, the geologic version of himself, now a part of the earth's shifting patterns, which he spent so

much time thinking about. Mountains and continents, rivers and oceans come and go, yet to those who knew him in his brief time on this planet, he will remain beloved, very much a steady rock and bright star, a source of stability and warmth that will anchor and light our memories of him as time spins ever onward and we hurl together through the great void, all subject to the forces and pressures and movements that would give him great delight to study.

Thoughts on Don Eicher

by Dr. Paul Weimer

I was quite fortunate that Don Eicher was my MS degree advisor at CU from 1978-1980. He was an extraordinary person who was very supportive of me throughout my studies.

My best story to illustrate Don's generosity and kindness occurred when I returned to CU as a junior professor. During spring 1991, I was scheduled to teach two courses-- a second-semester Intro course (Historical-1020), and stratigraphy (3430)-- to fill in for Don while he was on sabbatical. As a newbie, I had never taught either course, so I would need to write all my lectures from scratch; the first time teaching a course can be quite brutal. It gets considerably easier after your first year.

When Don was informed of my situation, his response stunned me. He actually volunteered to suspend his sabbatical and teach the stratigraphy class. This meant that I only had to teach two sections of the Intro course. So, instead of writing two sets of lectures, I "merely" had to write one set and then give it twice. For those of you who have not experienced teaching in academia, the fact that someone would volunteer to temporarily suspend their sabbatical to help like that is an extraordinary act of altruism and sacrifice.

I am eternally grateful and indebted to Don for his help. As it turned out, early in the semester, I caught influenza for the first time and lost ten days of prep time. As a result, I was behind schedule for the rest of the semester. I finished writing each lecture two minutes before I walked into the classroom. Obviously, this did not make for a good classroom experience. At the end of the semester, one student provided this succinct and accurate review: "you s*ck - give it up."

I shudder to think how badly the semester would have gone if Don had not helped.

So, as you read this, I want you to consider this simple question: how many professors have you known who were capable of such selflessness and generosity?

I was extremely fortunate to call Don my friend.

Emeritus Professor **Alexander Goetz** of Boulder died of cerebrovascular disease at age 86 on March 27, 2025. Alex excelled in his career as a scientist, academic, and entrepreneur, following in the footsteps of his father and of his direct ancestor, Benjamin Franklin. Born in Pasadena, CA, to Sylvia Scott Goetz and Alexander Goetz, Alex graduated from John Muir HS at age 16 and spent the next 2 1/2 years attending Schule Schloss Salem in Germany, where he became bilingual and attained the Abitur degree. After earning a BS in Physics and an MS in Geophysics at the California Institute of Technology, followed by Caltech's first PhD in Planetary Science, Alex's first job took him to Washington, DC, in 1967. He spent three years working for Bellcomm (AT&T Bell Labs) on the NASA Apollo program and had the distinction of having the first manned experiment on the moon, carried there on Apollo 8. In 1970, Alex joined NASA's Jet Propulsion Lab (JPL) in Pasadena to work on the Voyager Mission. Later, he started and ran the earth-oriented geologic remote sensing group, and spearheaded thermal inertia imaging and multispectral thermal imager development and analysis. From that base, he pioneered the development of hyperspectral imaging. Alex was a principal investigator in the Skylab, Shuttle, and Landsat 1, 2, and 7 programs. He received numerous awards, among them the NASA/DOI William T. Pecora Award and the NASA Medal for Exceptional Scientific Achievement. He served on the NASA, National Research Council, and Los Alamos advisory committees and was a consultant to government and private industry. In 1978, he founded his first of six companies, GeoImages, Inc., to enhance Landsat images for the oil and mining industries. While teaching remote sensing at UCLA in 1985, Alex was recruited to CU Boulder to establish and direct the Center for the

Study of Earth from Space within the Cooperative Institute for Research in Environmental Sciences (CIRES). He was Professor of Geological Sciences until his retirement from CU in 2006. In 1990, he co-founded his last company, Analytical Spectral Devices (ASD, Inc.), in Boulder, a manufacturer of portable spectrometers and spectroradiometers for remote sensing research and quality testing instrumentation for the petroleum, pharmaceutical, mining, meat, forest, and paper industries. ASD sold instruments in over 70countries and in 2009 won the Colorado Governor's Export Award. Until its sale in 2012, Alex was ASD's Chairman and Chief Scientist. To date, he has received over 13,000 citations for his research and published papers and holds 13 patents. Many other accomplishments and hobbies have filled Alex's life. He owned 7 sailboats (two of which he built) and sailed well over 70,000 miles on the Atlantic, Pacific, and Mediterranean; he was a runner, a woodworker, a photographer, as well as being a loving father and grandfather, and a kind, thoughtful, and generous man.

Emeritus Professor **William Hay** was born in Dallas, TX on October 12, 1934, the second son of Stephen J. Hay Sr. and Avella Winn Hay. He died on 10/27/2022 at the age of 88. Bill graduated from St. Mark's School of Texas class of 1951. He received a BS in Biology from Southern Methodist University (1955), MS in Geology at the University of Illinois at Urbana (1958), and PhD in Geology at Stanford University (1960). The focus of Bill's research was on fossilized nannoplankton. He was a pioneer in using nannoplankton for age dating rocks using fossil evidence (ie, a high-resolution microscope). During this period, he spent a good amount of time doing field research in Mexico. Bill also studied at Ludwig Maximilian University of Munich and the University of Zurich. He started his academic career at the U of Illinois at Urbana (1960) and then was a joint Professor of Geology at the University of Illinois and Professor of Marine Geology and Geophysics at the Rosenstiel School of Marine and Atmospheric Sciences (RSMAS) of the University of Miami (1968 -1974). During this period, he was an early leader in a deep-sea drilling project (DSDP) on the vessel Glomar Challenger funded by the National Science Foundation. The goal of this research was to understand the planetary history through ocean science. He continued this focus on marine geology as Chairman of the Division of Marine Geology and Geophysics at RSMAS for two years, and then as Dean from 1976-1980. He was President of Joint Oceanographic Institutions for Deep Earth Sampling, Inc. (JOIDES), in Washington, D.C. (1979 to 1982).

In 1982, he became Director of the University of Colorado at Boulder's Natural History Museum, and then became Professor in the Department of Geological Sciences and joined the Cooperative Institute for Research in the Environmental Sciences (CIRES). In the 1990s, Bill was a Visiting Professor at GEOMAR, part of the marine geological research institute at Christian-Albrecht's-Universität, Kiel, Germany.

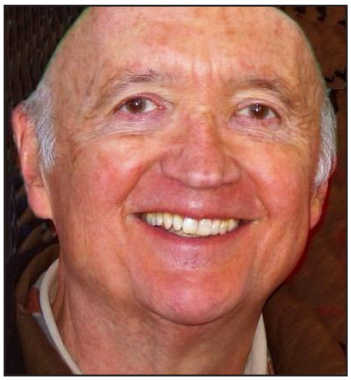
From 1991-96, Bill also held positions at the Institute for Baltic Sea Research (Warnemünde, Germany); University of Vienna's Institut für Paläontologie; Ernst-Moritz-Arndt University's Geologische Institut (Greifswald, Germany) ; and as L. C. Donders Professor at the Institute of Earth Sciences, University of Utrecht (The Netherlands).

After retiring from the University of Colorado (1998), he became Professor of Paleoceanography at GEOMAR until 2002. He was most recently Professor Emeritus of Geological Sciences at the University of Colorado and received an honorary doctorate from the Christian-Albrecht University of Kiel. Bill loved to teach and mentor. During his tenure, he supported and started the careers of approximately 50 graduate and doctoral students.

Bill also authored or co-authored approximately 250 publications during his career. Over the past few years, Bill authored a seminal publication on climate change (Hay, William W., 2016. Experimenting on a Small Planet - A Scholarly Entertainment. Springer International Publishing, Switzerland, 3rd edition). He has received numerous national and international awards in recognition of his contributions to the geological and oceanographic sciences.

While he was passionate about his students and research, Bill traveled extensively, were he developed his love of art, music, and opera. His fluency in German, Swiss German, Spanish, and French enabled him to seamlessly travel all around Europe and Asia. He also loved being at his home in Estes Park, Colorado, where he would entertain friends and neighbors with a gourmet meal, tend to his fish and rescue cats, debate current politics or just sit and watch the ever-changing climate of Rocky Mountain National Park.

Donald Clay Koenig (Geol '57) was born in Buffalo, New York on March 22, 1934. His parents were C. Warner Koenig and Ruth Chaney Koenig. A short time later, the Koenig family moved to Mountain Brook, Alabama, a suburb of Birmingham.



After his January 1957 graduation from the University of Colorado in Boulder with a Bachelor of Arts in geology, Don attended the Pensacola Naval Air Station in Florida at officer candidate school. He was commissioned in July of 1957 and sent to AIO School at Norfolk for a few months, and then assigned to sea duty staff on Okinawa (Taiwan Patrol Force) aboard USS Pine Island and Salisbury Sound (seaplane tenders) on their WestPac tours. His last year was at NAAS Brown Field, Chula Vista, California, until September of 1961. For a short time, Don lived in Coronado near NAS North Island. He moved to Pacific Heights in San Francisco for his first civilian job with Kern County Land Company (oil leasing).

He then moved back to Colorado, where he lived in Lakewood, as well as Glenwood Springs and Colorado Springs. One of his favorite locations was Aspen, where he was the first city and Pitkin County sanitarian, 1965 - 1969. He loved being a part of the Aspen community and made many lifelong friends there.

At age 40 in Colorado, he accepted a 3-year training program as a buildings manager with the federal General Services Administration. That led to his transfer to Anchorage, Alaska, in 1977. A few years later, he accepted a geology position with the Bureau of Land Management and ended up living in Anchorage for over 18 years as a geologist. His particular job as a BLM geologist was validating, with summer field work and detailed written reports, that the applicants for patent of their specified gold mining claims had sufficient gold value, as required. He spent two summers on a single long chain of claims on Ganes Creek near McGrath, Alaska. His co-workers always enjoyed assignments with him in the field, where he was held in high regard.

After retirement in mid-1995, at age 60, he returned to his home state of Alabama, where he happily reconnected with his many childhood friends. He immersed himself in an extensive array of world travel by land and sea. He thoroughly enjoyed cruising to exotic ports of call. He soaked up the culture, sights, and beauty of our precious earth. He was a kind, generous, and gentle man and much beloved by those who knew him.

Donald passed away on October 30, 2022, due to severe injuries caused by a fall in his home.

The Department greatly appreciates Don Koenig's generous gift through his estate plans. This gift will provide flexible resources for addressing the Department's greatest needs.

In Memoriam

Martha Andrews (Sp. of Emeritus John Andrews)
Willard E. Bissell (Geol'58)
Richard O. Breese (Bio'75, Geol'80)
Larry Conway (Geol'60)
Glenn E. Hunter (Geol'53)
Wallace L. Johnson (Geol'55)
Charles Lee Jr. (MGeol'82; PhD'87)
K. Lee Shropshire (PhDGeol'74)
Ria Spetzler (Sp. of Emeritus Hartmut Spetzler)
Gregory E. Thurow (MGeol'76)
David Uhlir (Sp. of Emerita Mary Kraus)
Jane Holmes Willhour (Geol'57)

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!

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Geological Sciences Faculty and Staff, 2024 - 2025

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

Bethany Ehlmann (arriving fall 2025)
Professor and Director of LASP
PhD, Brown University, 2010
Planetary Science

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

Steve Jacobsen (arriving 8/25)
Professor
PhD, University of Colorado Boulder, 2001
Mineralogy, Earth & Planetary Materials

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
Associate 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 Bertok
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
Carson Cucarola, Professional Research Assistant
Eric Ellison, Senior Research Associate
Edgart Flores, Postdoctoral Researcher
Daniel Gittins, Visiting Postdoctoral Fellow
Jessica Hankins, Sr. Professional Research Assistant
Annika Horlings, Postdoctoral Scholar
Alta Howells, Visiting Research Scientist
Srishti Kashyap, Postdoctoral Associate
Cullen Kortyna, Research Associate
Alan Lester, Lecturer
Ashley Maloney, Research Associate
Lisa Mayhew, Research Associate
Gordon McCurry, Lecturer
James Metcalf, Research Associate
Lexie Millikin, Postdoctoral Associate
Cajetan Neubauer, Research Associate
Catherine (Cat) Ross, NSF Postdoctoral Fellow
Mara Luisa Sanchez-Montes, 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

Emeritus Professors

John Andrews
William Atkinson, Jr.
Roger Bilham
David Budd
Bruce Jakosky
Mary Kraus
Giff Miller
Stephen Mojzsis
Don Runnels
Joseph Smyth
Hartmut Spetzler
Charles Stern
Jaia Syvitski
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