SOUTH DAKOTA MINES

Department of Geology and Geological Engineering

2024 Alumni Newsletter

Faculty and staff in Geology and Geological Engineering/Museum of Geology – 2024
Main staircase (under construction) in the Nucor Mineral Industries building

Front row bottom (l to r): Cleo Heenan, Sarah Keenan, Kevin Ward, Gokce Ustunisik, and Larry Stetler
Second row up (l to r): Darrin Pagnac, Victoria Karnes, Liangping Li, Kurt Katzenstein, and Colin Paterson
Third row up (l to r): Nuri Uzunlar, Robert Hall, Trevor Waldien, Zhi Ye, and Bill Roggenthen
Fourth row top (l to r): Christopher Pellowski, Edward Duke, Tim Masterlark, and Roger Nielsen

Absent: Nathanial Fox, Darrah Steffen, Samantha Wright, Arden Davis, Jim Fox, James Martin, Perry Rahn, and Foster Sawyer

From the newsletter coordinator – Christopher Pellowski

Greetings alumni and friends! Please enjoy reading the 2024 edition of the alumni newsletter.

This and past copies of the newsletter are accessible in the department's alumni newsletter section:

https://www.sdsmt.edu/academics/academic-departments/geology-and-geological-engineering/index.html

GGE Updates (from the Newsletter coordinator)

The Nucor Mineral Industries Building will be located on the south side of the quadrangle with construction substantially completed on Monday, October 21st, the first day of Spring 2025 classes will be on Monday, January 13th, and a planned ribbon cutting on Friday, April 25th.

We have a new addition to the Museum of Geology staff this year. Ms. Darrah Steffen (GEOL 15) joined us as the new Assistant Director. Ms. Steffen earned her M.S. in Geosciences from Fort Hays State University.

In fall 2024, there are 150 total students with 88 GEOL and 29 GEOE undergraduate majors and 33 graduate students enrolled across the three graduate programs with career placement remaining strong. In 2023-2024, we graduated 16 undergraduate and 11 graduate students.

A screen capture of the Nucor Mineral Industries construction camera on December 18th.

2024 GGE Department news:

January:

Ms. Kayleigh Johnson - **Museum of Geology hits a historic milestone**

https://www.sdpb.org/science/2024-01-22/museum-of-geology-hits-a-historic-milestone

February:

Dr. Darrin Pagnac - **Museum of Geology Invites Public to Rock & Fossil ID Day**

https://www.sdsmt.edu/news/releases/spring-2024-rock-and-fossil-id-day.html

July:

Dr. Christopher Pellowski - **South Dakota Mines Prepares Students to Tackle the Nation's Critical Minerals and Workforce Shortfalls**

https://www.sdsmt.edu/news/releases/criticalmineralminors.html

Dr. Sarah Keenan - **Mines Faculty Travel to Suriname with South Dakota National Guard to Discuss Academic Partnership Opportunities**

https://www.sdsmt.edu/news/releases/sdngtriptosuriname.html

Dr. Darrin Pagnac - **New additions coming to School of Mines Museum of Geology**

https://www.kotatv.com/2024/07/18/new-additions-coming-school-mines-museum-geology/

September:

GGE student Ms. Piper Kocina - **South Dakota Mines Students Help Collect Data for Missouri River Pipeline Study**

https://www.sdsmt.edu/news/releases/wdrwsinterns.html

Mr. Todd Gange (Geol 97) - **Mines honors graduates at Hardrocker Heritage Gala**
https://cara.sdsmt.edu/awards/alumni-awards

https://cara.sdsmt.edu/alumni/distinguished-alumni-award-recipients

https://www.flickr.com/photos/sdsmt/54018800091/in/album-72177720320559731

https://www.flickr.com/photos/sdsmt/albums/72177720320559731/

October:

Dr. Gokce Ustunisik - **Mines Professor Receives Prestigious Cambridge Fellowship**

https://www.sdsmt.edu/news/releases/ustunisikcambridgefellowship.html

Dr. Sarah Keenan - **New Summer Ceramics Engineering Program Opens at South Dakota Mines**

https://www.sdsmt.edu/news/releases/ceramicsengineeringprogram.html

Ms. Darrah Steffen - **The Museum of Geology comes to life with Night at the Museum**

https://www.kotatv.com/2024/10/21/museum-geology-comes-life-with-night-museum/

December:

Dr. Darrin Pagnac - **Museum of Geology, South Dakota Mines Implement Annual Admissions Fee for the Public Starting in 2025**

https://www.sdsmt.edu/news/releases/mogadmissionfee.html

https://www.kotatv.com/2024/12/03/south-dakota-school-mines-museum-geology-charging-admissions-first-time-ever/

Ms. Darrah Steffen - **Museum of Geology to charge admission fees after a century of free admission.**

https://www.newscenter1.tv/news/south-dakota/museum-of-geology-to-charge-admission-fees-after-a-century-of-free-admission

GGE Department Field Trips during 2024!

GGE very much appreciated the continued support by our friends and alumni provided during the 2024 Raising for Rockers campaign. Through your generous donations, $9,370.00 was raised to support department field trips! Clearly, you agree with us that these trips are an important part of the GGE experience and are worth supporting. We cannot thank you enough for your generous gifts, and we look forward to making this the focus of our Raising for Rockers campaign again in 2025.

There were two great field trips offered by GGE During 2024. In the Spring of 2024, Drs. Kurt Katzenstein and Sarah Keenan led a field trip to Death Valley, Owens Valley, and Long Valley in California. Your support was integral in making this trip a success and it directly impacted the educational journeys of our 17 student attendees.

In the Fall of 2024, Dr. Ward, with the help of Drs. Hall and Paterson, led a field trip to Yellowstone National Park over Labor Day weekend. In all, 16 students attended this trip which allowed them to immerse themselves in the volcanic wonderland of Yellowstone.

As a result of your generous donations, we are planning another ambitious field trip over Spring break in March of 2025 when we plan to visit Big Bend National Park in Texas, and Carlsbad Caverns and Guadalupe Mountains National Park in New Mexico. I am sure this will conjure up fond memories from alumni who attended one of the many similar trips led by Dr. Gries decades ago.

Once again, thank you for your generous contribution to support GGE field trips. As I am sure you will agree, the impact these trips have on our students is immeasurable.

Swapping stories around the campfire at Yellowstone National Park.

Christopher Pellowski

Our field camps continue to operate from the SD Mines campus. During the two five-week sessions, we had 14 students (6 SD Mines) from 8 universities in session 1, and 10 students from 10 universities in session 2. The decreased enrollments this year were very likely due to the flawed FAFSA (Free Application for Federal Student Aid) form rollout by the Department of Education, and we are optimistic the numbers next year will rebound. The weather again this year was challenging, and I continue working on identifying/visiting additional field areas for future mapping projects to be incorporated when the Nemo field station is constructed.

I taught Geol 451/L Economic Geology/Lab in the spring semester with nine students enrolled. The uranium companies at the spring career fair were inquiring about potential students to be hired after graduation based on the rise in spot prices and future exploration. This year I am serving on five department committees and chairing the recruiting and outreach committee. This past year I also served on an ad-hoc committee to create the critical minerals minor open to all students that will focus two areas of emphasis including processing and extraction within the Department of Materials and Metallurgical Engineering and exploration and development within the Department of Mining Engineering and Management. I am optimistic this minor will help create opportunities for our students to be involved in helping fulfill our nation's future critical mineral needs. I will be teaching Geol 351 Earth Resources and the Environment during the Spring 2025 semester with 30 students already signed up.

Session 1, 2024 group photo with Grubby.

Session 2, 2024 group photo with Grubby.

Dr. Pellowski represented the GGE Department at the RCAS 8th Grade College and Career Fair to get the students excited about rocks and minerals in their everyday lives.

Be sure to visit and like us on Facebook and follow our posts.

https://www.facebook.com/SDSMTGeologyGeologicalEngineering

From our Emeritus Professors:

Colin Paterson

After Becci and I returned from our annual New Zealand summer to Rapid City in April, my northern summer was consumed with clearing out excess rocks and documents from my office prior to our move to the Nucor mineral industries building in November 2024. It is amazing how many rock specimens one collects in a career spanning more than 50 years – it was also disturbing to find some specimens still in their sample bags, unopened. However, using my field notebooks, I was able to establish what was worth saving, and what could be tossed out. Any specimens from the Homestake gold mine had to be saved as access to at least the levels below 4850 is no longer possible. Many specimens were catalogued for the ore collection housed in the PRL, others added to the economic geology lab specimens, and others given away in the hallway for students to collect or taken home for our rock garden! I have moved other important documents etc. to my new emeritus office in the Nucor MI building which I share with Dr Bill Roggenthen. Moving from one office plus overflow area to a shared office is challenging, but this week I achieved it.

Dr Kelli McCormick (MEM) and I continue to advise the Society of Economic Geologists student chapter. In October, the chapter celebrated 25 years of operation. We were the 21st chapter to be initiated; now there are more than 120 worldwide. They continue to conduct monthly meetings with 20 plus attendees, mostly presented by current students reporting on summer internships in the mining industry. The upsurge in exploration activity in the Black Hills for gold and lithium is providing students and graduates with increased job opportunities. The chapter took a field trip to the Dakota Gold exploration project based in Lead, and under the guidance of James Berry, examined drill core, and visited one of their drilling locations in the Richmond Hill area.

Becci and I spent a month in southern Africa, including attending the annual SEG conference in Windhoek, Namibia in September 2024. I enjoyed visiting with colleagues with whom I worked in Namibia (2000-06) and South Africa (1978-81), as well as introducing Becci to the southern African wildlife and geology, the highlights being 6 days driving around in the Etosha Game Park in northern Namibia, and the Krystall Gallerie (photo of quartz crystals below) in

Swakopmund on the Atlantic coast. The displays of Namibian mineral specimens were amazing for their beauty, and in some cases, their size. We stopped to view the Hoba Meteorite (photo below), the largest meteorite on Earth, near Tsumeb. We also stayed in Cape Town with colleagues from the University of Cape Town, and we toured old haunts including the VOB squash club.

I continue to be frustrated by the lack of a fulltime Economic Geology faculty member in the department – there are so many opportunities for research in the areas of critical minerals, and students are getting opportunities for internships and employment with mineral exploration and mining companies. If you are working for a mineral company that would like to participate in an endowed faculty position in economic geology, please contact me or Dr Rob Hall, our department head.

From the Faculty:

Victoria Karnes

Hello all, and Happy Holidays!

Two wonderful updates for this year! First, I have joined the PhD Program at Mines in Data Science and Engineering! It has been a blast so far, and I look forward to bringing even more knowledge in data science to our department over the course of my continued education. Second, Zach and I are engaged! We will be getting married this coming June and are very excited to keep growing our lives together here in Rapid City!

In regard to Mines, I have continued to teach all GIS classes as well as Surveying. I have also continued teaching and working on expanding the GIS Workshops for the community, which I enjoy teaching in the winter and summer. They are now taught online to allow more interested parties outside of the state to attend and to provide participants with more time to complete the courses. I also had the opportunity to attend the ESRI User Conference in San Diego, the premier GIS conference, for the first time this year, which has allowed me to expand and update our GIS curriculum even further and bring back new, innovative ideas in data capabilities for the University as a whole.

I have also greatly enjoyed being the advisor for the Hardrockin' Drama Club. The Director (Matt Leonard), our wonderful officers, and I have spent countless hours preparing and presenting the clubs' works to the University and the community and have enjoyed every second of it. Our next show, *Eurydice*, will be debuting in Spring 2025, and is sure to be a hit! If you find yourself in town, we would love to see you there!

Wishing you all the most wonderful and fun-filled holiday season!

Victoria Karnes

Kurt Katzenstein

Greetings! I hope you had a wonderful 2024! The Katzenstein family enjoyed another year of logistical nightmares associated with getting kids to all of their extracurricular activities. Brianne (14) played varsity soccer again this year as a freshman. She also played high-school basketball and golf, and won her division in the High Plains Regional Science Fair! Hannah (13) played JV soccer as an 8th grader and enjoyed her season of middle school basketball. She has mentioned trying out for the track team this spring. Leslie (10) continues to enjoy club soccer and has taken a real liking to playing the violin.

Our family hosted the annual family reunion for my wife's side of the family in July. This brought a total of 26 people to our house for 9 days which was good fun. Brianne, Leslie, and my dad (who turned 80 this year!) took a backpacking trip to the Lost Twin Lakes in the Bighorn Mountains. This was a relatively easy hike, so it worked out perfect for Leslie (her first trip).

I, along with Dr. Keenan, led a spring break field trip to many of my old haunts in California. We spent a few nights camping and exploring Death Valley and enjoyed seeing many of the geologic wonders in Owens Valley and Long Valley. This trip would not have been possible without the donations from our friends and alumni during the Raising for Rockers event. THANK YOU!!! We are currently planning our 2025 trip to the Big Bend region which is exciting as it is a locality that I have not ever visited.

My term as the Faculty Senate Chair for South Dakota Mines continued an extra semester during the Fall of 2024. The initial plan was to bow out after May but with our recent search for a new university president, the chair-elect was asked to step in and serve as the Interim Head of another department so I said I would over for him for one semester. Serving as Senate Chair comes with a wide range of responsibilities, but it has been an interesting journey over the past 2.5 years.

I also continue to serve as the ABET Commissioner for Geological Engineering. This past accreditation cycle, I served as a team chair on one review and a program evaluator for two international GEOE programs. This work is very interesting, and it helps me keep abreast of all things ABET which is a benefit to our own programs.

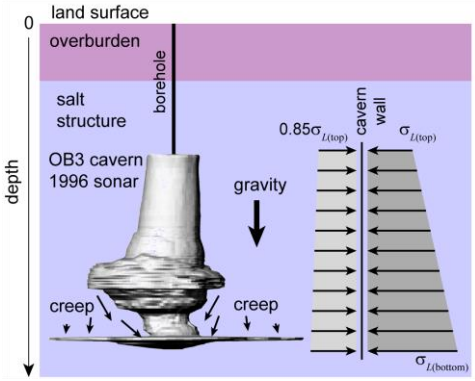
I wrapped up an industry-funded InSAR study early in 2024 that helped a municipality better understand their aquifer system response to pumping. I also am part of a proposal submitted to fund the design and implementation of an algae wheel wastewater treatment facility in Boulder Canyon – fingers crossed! One of my M.S. students graduated in May after completing his thesis associated with work he was doing at RESPEC Inc. investigating the impact of thermally sealed boreholes in salt.

I hope that you and your family are well and that you have a very enjoyable 2025. Best wishes!

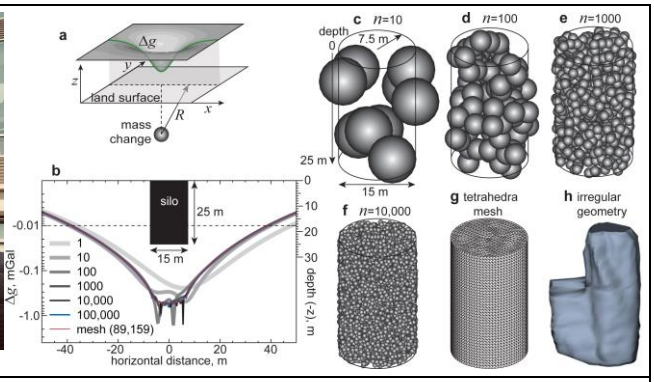
Group photo at Yellowstone National Park Fall 2024.

Tim Masterlark

(Top Left) Descending to a lower drift in the Bochnia Salt Mine, near Krakow, Poland. This was the first of twelve flights with progressively smaller holes, where big feet and broad shoulders become increasingly problematic. (Top Center) My dynamic MS students, Andrew Guilford and Jake Sanders, take a well-deserved break from the technical session at the SMRI Conference in Edmonton, Alberta, Canada. (Top Right) Wellhead for the Hydrogen storage cavern at ACES in Delta, Utah. This is the first utility-scale H_2 power facility in the U.S. (Right) Schematic of a salt cavern stress regime. Our research investigated threats to cavern integrity and mitigation strategies for loading scenarios from nearby earthquake activity (modified from Borglum et al., "Earthquake hazards for salt caverns caught in the convergence of tectonic plates", SMRI Library, 2024).



Twenty-twenty-four was another year in the salt mines. Literally. My industry colleagues and I published a paper with the Solution Mining Research Institute (SMRI) and presented some very exciting conclusions at the SMRI Spring 2024 Conference in Krakow, Poland. Thanks to generous support from WSP USA, RESPEC, and Agapito Associates Inc., my entire research team attended the Fall SMRI 2024 Conference in Edmonton, Canada. I built a new collaboration with Sandia National Labs to study the integrity of underground energy storage in salt caverns of the Strategic Petroleum Reserve. Finally, I gave a safety briefing during a visit to the Advanced Clean Energy (ACES) for hydrogen storage in Delta, Utah. I took three trips to Washinton D.C. for leadership and scientific advisory purposes. I led the Magmatic Systems Team for NSF's Continental Scientific Drilling Summit and laid the foundation for future drilling to explore shallow and hot magma systems (www.youtube.com/watch?v=w0ApFemFduA). Dr. Jay Tung and I delivered a workshop "Finite Element Models for Earthquake Deformation" as part of our collaborative NSF grant. This workshop brought graduate students from around the country to the SDSMT campus for an immersion into our world of numerical models.



(Left) Distinguished Professor, 2024. This was a capstone career achievement and an incredible honor. (Center) Undisclosed review panel activities in Washington D.C. A very, very heavy lift. (Right) Monte Carlo integration strategies to simulate gravity anomalies for concealed missile silo excavation activities in China. Stand by for details.

Roger Nielsen

This past year was notable for its combination of many of the same things together with some unique experiences and opportunities. Gokce and I once again made a number of trips to either/both coasts with family and to visit family, as well as trips focused on work with colleagues on our research and to provide access to research facilities for our students. This year there were so many trips that I cannot honestly remember the number – but at least I did not spend a single night in an airport (unlike last year when we spend three nights in three different airports).

Regardless, our trips were enormously successful, and the students have had the opportunity to work with researchers at some of the best universities in the US. Gokce will provide details of that research and of her being awarded a fellowship at the University of Cambridge (during the Lenten term as the say at Cambridge). We are very much looking forward to this opportunity to develop new collaborative projects and to build for the future. That future will be made better by our new building (again I am sure it will be detailed in other letters) and the new facilities in it.

As part of my other duties, it was my great pleasure to work with Academic Affairs and the faculty senate to develop new position types for SD Mines – including the guidelines for the Professor of Practice and Research Professor faculty positions. These new position types will grant greater flexibility to Mines and open up new pathways to engage with industry and conduct basic research.

In addition, we have implemented new methods related to faculty development including mid-term review – designed to give early career faculty guidance as they approach the critical step of applying for tenure, and peer review of teaching – a faculty-based process to provide a forum for faculty to help one another learn from one other to refine their methods.

Gokce Ustunisik

Dear Alumni and friends,

Merry Christmas and Happy New Years! So much to tell you about this year - 2024 and once again I am trying this letter in the plane back from American Geophysical Union (AGU) Fall Conference in Washington, DC. AGU was extremely well attended this year and my highlights were a workshop entitled "Experimental Petrology in Subduction Zones: Advancing Research and Community Initiatives with SZ4D" (https://www.sz4d.org/events/experimental-petrology-in-subduction-zones%3A-advancing-research-and-community-initiatives-with-sz4d) that I was running with my co-conveners from Carnegie Institution for Science (Mike Walter, Andrea Goltz) and Montane State University (Madison Myers) which gives an overview of the state of the "arc", including open questions relating to subduction zone volcanism that may be addressed by addressing the gap between the experimental and modeling approaches and chairing a special session entitled "V11D: Experiment to Model to Interpretation: Insights into the Impact of Experimental Design on Models and Interpretation of Natural Systems" (https://agu.confex.com/agu/agu24/meetingapp.cgi/Session/227782) with the goal of initiating a community wide discussion of the connections and limitations of the experimental database, the assumptions on which our models are based and challenges of the application of those models to data from complex natural systems. Both events were well attended and a huge success with three presentations with my research group.

2024 was a hectic yet extremely productive year for me and my graduate students. My research program was funded by 5 active federal grants (4 NSF: 3 PI, 1 co-PI and 1 IMLS: co-PI/Science Lead) totaling $1,069,839. These research grants provided funding for 1 PhD (Olivia Daynes), 1 MS (Madison Betts), and 2 undergraduate students (Ian Christiansen, Lucy Palmer). Besides my active grants, I wrote 4 new research proposals 3 as a co-PI and 1 as senior personnel. Among these, 2 were major research grants submitted to NSF EPSCoR RII Track-2 FEC and NSF Research Traineeship (NRT) programs both of which has graduate student support and 2 of which were instrumentation grants (co-PI and senior personnel) submitted to NSF IF and NSF MRI programs.

During Fall 2023, I submitted an application for sabbatical leave to the South Dakota Board of Regents. My goals for this sabbatical leave were focused on the development of new collaborative projects as well as access to facilities and analytical equipment not available at South Dakota Mines while I continue the research on my currently funded projects by NSF and IMLS. Specifically, I planned to work on new projects with colleagues at the University of Cambridge, Woods Hole Oceanographic Institute (WHOI), and Lamont Doherty Earth Observatory (LDEO) of Columbia University. Each of these institutions has a large group of petrologists that have been working on projects that are parallel with my long-term research goals. I have worked with some of these individuals at these institutions in the past but needed to spend time now to develop new ideas that will sustain my research program. I submitted a successful research proposal to cover my travel and research plans at the University of Cambridge and was awarded the "Derek Brewer

Visiting Fellowship" for the Lent Term (January-April 2025). Only 3 such fellowships are funded each year from a pool of over 100 applications. Dr. Roger Nielsen and I are very excited with this opportunity future potential proposals from our research at Cambridge include building on our global dataset of CO_2 measurements as referenced to the localized dataset collected in Iceland by the Cambridge group which will expand my group's ongoing research at WHOI, OSU, and LDEO. My Derek Brewer Fellowship has been widely recognized and covered in variety of press releases (https://www.sdsmt.edu/news/releases/index.php?page=11; https://www.sdsmt.edu/news/releases/ustunisikcambridgefellowship.html) which will bring a lot of recognition to SD Mines and our department. I am grateful to my department chair Dr. Robert Hall, my colleague Dr. Edward Duke, and my PhD student Olivia Daynes for their collective efforts to cover my teaching in Spring 2025.

On the teaching side, I continued teaching department's 2 required Earth Material courses "Mineralogy and Crystallography" in the Fall and "Igneous and Metamorphic Petrology" in the Spring in addition to my 2 graduate courses "Volcanology" and "Planetary Geology" both of which attract a broader range of graduate students in our department. Teaching both Earth Materials courses provides me the opportunity to work with students for a full year and get to learn their strengths and weaknesses. Our students truly enjoy the incorporation of microscopic observations into hand specimens. Their struggle in applying phase equilibria and thermodynamics into igneous and metamorphic rocks diminishes as they observe the connection between textures and the chemistry of rocks. They appreciate how basic concepts of chemistry become more tangible and applicable to geology. Besides classroom teaching, my efforts on teaching and learning continued with chairing several "Peer Review of Teaching" committees both at the departmental level and introducing this excellent opportunity of improving our teaching with the input from our peers to the university level. This is not only an opportunity for the faculty member being reviewed but also provide the chair and the member of this committee a venue to learn about each other's teaching style, the topics that we cover, and triggers us to think better ways to find the connection among different course with the idea of making the learning continuous. Finally, I have been developed several teaching modules to be used in courses ranging from basic Mineralogy through Advanced Petrology to be uploaded to **SERC** (NSF-funded **S**cience **E**ducation **R**esource **C**enter at Carleton College) website which will open my teaching materials to wide range of audience.

I am quite proud of the progress put forward by my graduate students. Olivia (Daynes, PhD) and Madison (Betts, MS as of SP 24, PhD as of FA 24) both received "Outstanding PhD and MS Student" awards by the GGE department and were recognized during Spring 2024 student award ceremony. Olivia Daynes (PhD, Geology) submitted 2 abstracts (1 first-author, 1 co-author) and presented the results from the first chapter (paper) of her dissertation research at AGU Fall Conference on Dec 11-15, 2023, in San Francisco, CA. She successfully passed her written/qualifying exam and earned her PhD candidacy in April 2024 after defending her dissertation proposal (comprehensive exam). Besides NSF-Graduate Research Fellowship Proposal, Olivia submitted and was granted 2 research, 3 travel grants, and Harriet Evelyn Wallace

Scholarship. During Summer 2024, Olivia submitted the 1st manuscript of her dissertation to Earth and Planetary Science Letters (EPSL) which was accepted with revisions besides being co-author in Madison Bett's manuscript from her MS thesis. Madison Betts (MS, Geology) submitted 4 abstracts (2 first-author, 2 co-author) and presented the results from MS thesis research at AGU Fall Conference on Dec 11-15, 2023, in San Francisco, CA and on Dec 9-13, 2024, in Washington, DC. Madison successfully defended her thesis in April 2024 and graduated with her MS degree in May 2024. During SP 2024, she submitted 3 graduate student research grants (GSA, MSA, NSF-GRFP) in addition to receiving two travel grants. Madison MS thesis manuscript was submitted during Summer 2024 to Geochemistry, Geophysics, Geosystems (G-cubed) journal which is currently under-review. Finally, Madison was accepted to our PhD program and started in Fall 2024.

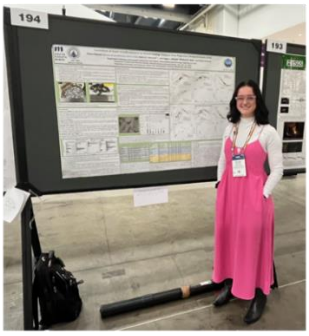
Also, thanks to my research group and collaborators in various projects, 2024 was a productive year for publications and presenting. Between previous and current students, our group's work was presented at a wide variety of conferences with 10 abstracts at 2023 and 2024 AGU, 2024 Annual GSA, 2024 Tenth International conference on Mars, and 2024 Lunar and Planetary science Conferences in addition published 3 journal articles including Dygert, Ustunisik, Nielsen, 2024 (Nature Communications, Impact factor 16.6); Hewitt*, Ustunisik, Nielsen, 2024 (G-cubed, Impact factor 3.45); and Govil, Vaughn*, Kaur*, Ustunisik, et al., 2023 (Eds. S. Das and HR Dash. Elsevier) along with 4th accepted paper in EPSL by PhD student Olivia Daynes and 5th paper under review in G-cubed by Madison Betts.

Besides, research and teaching, I continued being involved in several department, university, and professional committees. I still believe that I had the highest impact as securing funding as Curator of Minerals at MoG; chairing Peer-Review of Teaching of various courses; serving at Departmental Promotion and Tenure and Mid-Term Review Committees; serving as faculty representative at University Research Committee; helping to graduate school and leading GGE department's graduate student recruitment and outreach efforts under the SD Mines R2 status initiative; serving at the Civil Engineering faculty search committee; leading IEDA traceDs and Library of Experimental Relationships (LEPR) in guiding FAIR data principles (EarthChem-Experimental Petrology); serving at 3 NSF and NASA panels and reviewing proposals for various solicitations under NSF and NASA; outreach efforts in STEM Tribal College Committee; and serving at the Steering Committee for Center for Sustainable Solutions.

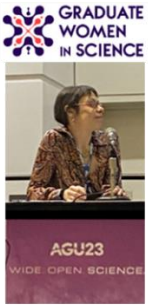
As a final note, I was very much honored by getting international recognition for my research as a Derek Brewer Fellow by the University of Cambridge, UK; as a semifinalist for Graduate Women in Science (GWIS) Early Career Award; being nominated by my colleagues for the SD Mines Presidential Award for Outstanding Professor and Bernard A. Ennenga Excellence in Teaching/Mentoring awards. We are beautifully settling in our new Nucor MI building, and we do hope that you will visit our state-of-the-art research laboratories and new teaching classrooms when you are next time on the campus. We are also very much looking forward to the new leadership at the institutional level with welcoming the 20th president of SD Mines Dr. Brian Tande

(https://www.sdsmt.edu/news/releases/2024tandechosenas20thpresident.html#:~:text=The%20South%20Dakota%20Board%20of,who%20retired%20this%20past%20summer) who will start in January, 2025! Best wishes to you and your loved ones for a happy and healthy holiday season and lots of hopes for 2025!

Olivia Daynes (PhD, current), 2023 AGU Fall Conference, San Francisco, CA



Olivia Daynes (PhD Current), Ustunisik and, Madison Betts (MS, SP 24; PhD Current), 2023 AGU Fall Conference, San Francisco, CA



Ustunisik, semifinalist for "Graduate Women in Science (GWIS) Career Award"

Madison Betts (MS, SP 24; PhD Current) Receiving GGE 2024 Outstanding MS Student Award from Dr. Jim Rankin

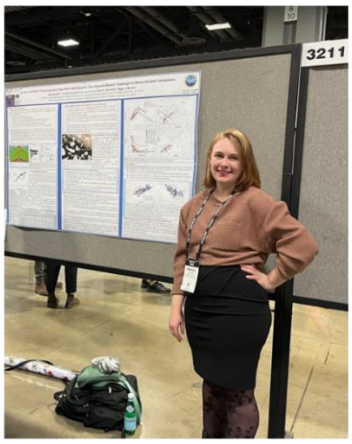
Olivia Daynes (PhD Current) GGE 2024 Receiving Outstanding PhD Student Award from Dr. Jim Rankin

Madison Betts (MS, SP 24; PhD Current); Roger Nielsen, and Olivia Daynes (PhD Current) at 2024 Spring Honors Convocation

Ustunisik after the Special Session at 2024 AGU Fall Conference, Washington, DC

Madison Betts (MS, SP 24; PhD Current); Gillian Clark (MS, SP 24), and Lauren Stern (MS, SP 24) At 2024 Spring Commencement

Madison Betts (MS, SP 24; PhD Current), 2024 AGU Fall Conference, Washington, DC



Ward and Ustunisik are meeting with prospective graduate students at SD Mines Booth at 2024 AGU Fall Conference, Washington, DC

From Black Hills Natural Sciences Field Station (BHNSFS) and Nuri Uzunlar:

The BHNSFS is the world's largest field school offering summer and winter camps in earth science and related engineering fields including geology, geological engineering, environmental geology, volcanology, petroleum and geomorphology on six continents. In 2024, 152 students from across the USA mapped geological environments ranging from volcanoes to fault zones in Hawaii, Türkiye, France, Spain, Morocco, Iceland, and the Black Hills of South Dakota. We are getting ready for the winter camps in Hawaii, Death Valley, New Zealand and Ecuador. All four camps will start after Christmas.

In addition to traveling from camp to camp I attended GSA in Anaheim, CA and AGU in Washington DC where the field station had a booth.

Nemo Field Station:

Location: Near Lien iron mine, Nemo, South Dakota.

Land has been donated by Pete Lien and Sons and is located at the nothern edge of the mine. TSP Engineering is working on plan designs and initial cost estimates.

Building size and description: Plans include a lodge style A -frame building with dormitory space for 40-50 people (students and faculty) for field camps and other educational activities.

For additional information about upcoming field station activities please visit: http://geologyfieldca mp.sdsmt.edu, call me at (605) 394–2494 or write to nuri.uzunlar@sdsmt.edu


Big Mama's Beer Garden
Nemo Flag
metery
Nemo Rd
Iron
Mine
Nemo Rd
Roberts Draw

Kevin Ward

Hello everyone. 2024 was an eventful year for me. I got engaged to my now fiancée in February on an overlook near Bear Mountain in the Black Hills. A short two weeks later, I tore my Achilles playing intramural basketball. The road to recovery has been a long and rough one but I am back to my old self. I have been on a quest to visit more of the Black Hills and have experienced some amazing northern lights on unnamed peaks in the Black Hills. In the late summer, I was able to thru-hike the Laurel Highlands Hiking Trail (a short 70-mile trail in Pennsylvania) and the Centennial Trail in the heart of the Black Hills. I am hooked and now preparing /training for the Continental Divide Trail (a 3,100-mile trek that will start for me in Canada near Waterton Park and end at the Mexico border in NM). This will be a 5-month hike that will start in early July. Unfortunately for the GGE department, I will be moving to my new home in Pittsburgh after getting married this summer in Alaska. We did some sightseeing out there by plane this year and it looks like it will be an amazing experience. This early on, I am not sure what I will be doing for work, but I have some exciting things lined up. Regardless, this will be my last year here at South Dakota Mines and I will finish out my tenure here at the end of May 2025. With the new building nearing completion and new management at the department and institutional level, things certainly are feeling different around here from when I first started almost seven years ago. I am hopeful that the field emphasis that drew me here at first can continue in the future. For this upcoming Spring Break Trip, Dr. Katzenstein and I will be taking a group of students down to Big Bend National Park with several other exciting stops along the way. We are grateful for the gifts of support that continue to allow these trips to be offered. I will miss these trips dearly, but I hope to continue to help our students with some field camp instructor opportunities in the future. I will conclude with an unattributed quote for any of my former students who may be reading this “If you don’t sacrifice for what you want, what you want becomes the sacrifice.”

Zhi Ye

Dear Alumni,

Warm greetings from Rapid City! Reflecting on the past year, I am thrilled to share with you both personal and professional milestones that have made this year truly rewarding.

On the personal front, my family and I experienced significant changes. Early this year, we welcomed our newest family member, Elsie—our second baby girl, who was born here in South Dakota. Additionally, we purchased our first home, settling down comfortably in the Black Hills Region. It is no exaggeration to say that we now proudly call this beautiful place our home, thanks to its welcoming community and abundant outdoor opportunities.

In teaching, I was fortunate to engage with our talented students through courses in *Drilling & Production Engineering* and *Introduction to Geomechanics*. The enthusiasm and dedication of our students have been inspiring. One highlight of this year's teaching was an enriching field trip to Dakota Gold, where students connected classroom knowledge to real-world applications. Seeing their growth and success has been one of my biggest motivations.

On the research side, this year marked an exciting beginning. I was honored to receive the *South Dakota Board of Regents Competitive Research Grant* and the *Nelson Research Grant*, both of which have provided essential seed funding to initiate our geomechanics research program. Additionally, I successfully recruited two exceptional Ph.D. students who will help drive our program forward. With everything on track, I am enthusiastic about the research potential in geomechanics and geo-energy we can unlock in the coming years.

I want to express my deepest gratitude to my colleagues in the Department of Geology and Geological Engineering. Their unwavering support has been invaluable in helping me settle into my role and lay a strong foundation for both my teaching and research. I feel truly fortunate to be part of such a collaborative and inspiring department.

As we close out another year, I look forward to what lies ahead, and I extend my warmest wishes to you and your families for a happy and prosperous New Year.

Field Trip to Dakota Gold: Exploring Mining and Drilling Expertise.

Photos from the Death Valley National Park Spring 2024 field trip.