I have no intention to minimize the tragic events of these pandemic times. Anecdotally, my daughter works as a travel nurse in COVID units, sees the carnage, and does her best to comfort patients and the collaterally damaged families. We are all caregivers, and I am thankful for the friends, family, and alumni that we have to support our UGA Geology community. There are few truly meaningful words I can offer, except to say, "may peace be upon you in these times." That said, I wish to turn your attention to all the good things that are happening around the UGA Geology department!

Faculty are about to report their 2021 activities, so I will fully update everyone in the Spring 2022 newsletter. But brief faculty highlights include: Doug Crowe is still updating (the now massive) Allard collection with specimens from around the world; Andy Darling has popularized the dinosaur course across campus and continues his research on the application of cosmogenic nuclides to landscape evolution; Charlotte Garing has got her lab going to further experiments on reactive transport and mixed-fluid phase modelling in porous media; Erv Garrison is "flying" his underwater drone off the coast of Georgia looking for evidence of archeological activity during the Holocene and Pleistocene; Rob Hawman is still our consummate Physical Geology Instructor and continues to publish new geophysics insights about the nature of Earth's crust and upper mantle boundaries; Steve Holland, as Grad coordinator, guides students on clear paths to completion and he is leading the charge to better place the terrestrial sedimentary record in the context of global stratigraphic sequences; Christian Klimczak is now leading summer Geology Field camp and advancing the UGA Geology Center for Planetary Tectonics; Adam Milewski has mentored two more MS students to completion and venturing into machine learning and artificial intelligence to advance hydrologic science; Valentine Nzengung is now reaching the world in YouTube with topics on how to go from the benchtop to commercialization for the chemical neutralizing of explosives; Marta Patino-Douce has taught her last sections of geology, moving to New Mexico, and will return in April to be recognized for her long and valued career in UGA Geology; Mattia Pistone is wearing a path between Athens and Europe where he is in the process of building an extensive collaborative network linking volcanology to numerous disciplines to assess eruptive hazards; Bruce **Railsback's** freely available online resources continue to grow and provides a place for everyone to learn more about earth sciences, and he includes numerous graphics for use in teaching; and Sally Walker is graciously using the endowed Shellebarger Professorship funds to underwrite undergraduate experiential research, where she is mentoring students in taphonomy and paleoecology.

We had a very robust and enriching colloquium series this Fall term (Thanks to Rob Hawman for coordinating it!). The new hybrid format for colloquia allows for invited speakers to have a choice to appear either face-to-face or remotely. Regardless of format, all talks were made accessible by zoom, where it was great to see alumni touching base. Grant Eager even managed to have our colloquia qualify for professional geologists in North Carolina to maintain their continuing education units. We heard talks on the topics: *Rheology* of lavas (Dr. Arianna Soldati, NC State); Recruiting next-generation geoscientists (Dr. Kelly Lazar, Clemson); Urban hydrology and stream ecosystems (Dr. Sarah Ledford, GA State); Geochemistry of ore deposits (Dr. Laura Bilenker, Auburn); *Himalaya-Tibet* orogens (Dr. Tim Diedesch, GA-Southern); Underwater drones (Dr. Erv Garrison, UGA Geology: see photo inset); Dynamics of glacier change (Dr. Billy Armstrong, App



Erv Garrison is "flying" his underwater drone off the coast of Georgia.

State); and Topography of glacial lake outbursts (Dr. Max Dahlquist, Univ. of the South).

We anticipate an equally exciting and diverse series of talks for the Spring 2022 term (Thanks to Sally Walker for coordinating it!). As of this writing, we have slated talks on: *Theory and measurement of soil creep* (Dr. David Furbish, Vanderbilt); *Past Polar Forests* (Dr. Kirk Johnson, Sant Director, Smithsonian Museum); *Metallogeny of Turkey* (Dr. Emin Ciftci, Istanbul Technical University); *Bivalves and temperature history of Mid-Atlantic Continental Shelf* (Dr. Eric Powell, Southern Mississippi); *Lake Salda Turkey microbialites and Mars* (Dr. Nurgul Balci, Istanbul Technical University): *Spatial Ecology* (Dr. Jenny McGuire, GA-Tech); *Mantle plumes* (Dr. Juliane Dannberg, U. Fla), *Jezero Crater Mars* (Dr. Linda Kah, University of Tennessee); *Large igneous provinces and Devonian extinctions* (Dr. Sarah Carmichael, Appalachian State); *Regolith of Saturn's moon Enceladus* (Dr. Emily Martin, National Air and Space Museum, Smithsonian); *Shorelines and a geologist's take on climate* (Dr. Chester



Fall gathering after colloquium outside of the Geology Building

Jackson, Ga-Southern University); and *The Late Paleozoic and brittle star diversity* (Dr. Colin Sumrall, University of Tennessee). Stay in touch with it all by going to <u>https://geology.uga.edu/events/all</u>.

Good news is that we are embarking on more field trips and social gatherings! This fall started with an after-colloquium gathering outside of the Geology Building (see the photo of the crowd on the steps). With an abundance of caution, we stood outside and had food delivered in individually packaged plates. We also drank individually packaged beverages 😨 and all had a great conversation, catching up with each other on what we did during the more isolating (pre-vaccine) times of this pandemic. Despite the social awkwardness of not having seen each other for over a year, we managed to quickly fall back into talking about geology, football, food, and not-politics.

Class field trips have resumed (Again, with great thanks to alumni and industry folks that donate field trip travel funds to the Geology department!... if it was not for you, we could not do



Class field trips: GEOL 3010 Haile Gold Mine

half of the trips that we do). The Earth Materials class (GEOL3010) ventured to the *Haile Gold Mine* in South Carolina, with a huge thanks to alumnus, Jake Lee, who enabled unprecedented access to the mine and a core shed to view thousands of feet of drill core (see the photo of class in front of Oceana passenger van, that moved us around the mining complex in great comfort). GEOL3010 students had explained the full

cradle to grave process of mining that included visiting an active drilling team and retention ponds that will ultimately become fishing holes for future generations to enjoy after the mining is finished. Sorry, no mine photos allowed, but a trip to Google Earth can give you an idea of the massive scale of operations 34° 35.864'N, 80° 32.354'W.



Class field trips: FYOS Kaolin Mine

As part of one of several first-year odyssey seminars (FYOS) offered by the department a field trip to the Kaolin mines was made possible with the help of Gil Rowland from KaMin Performance Minerals in Wrens, GA. He facilitated a visit that included a tour of the processing plant, mines, and remediated mine sites (See photo of the mine site and exposure of kaolin bed and overburden removal operations). Students learned about the uses of kaolin, its economic impact on the State, mining and environmental laws, and the geologic origins of the deposits. Students really liked the XRD testing of many commonly used products (makeup, paper, pharmaceuticals, etc.) to see that kaolin is often a component in what they either put on their face, write on, or eat. Other FYOS offered this year explored

topics such as The Mysteries of water, Journey to the Earth's interior, and Drones and geology.

Field, lab work, and face-to-face conferencing are resuming too. This summer Christian Klimczak founded the Center for Planetary Tectonics at UGA, where his group is exploring the geology of asteroids. Ph.D. students **Jupiter Cheng** and Christian are working on the tectonic evolution of Asteroid 4Vesta. Vesta has large tectonic landforms, and large (hemisphere-scale)

meteorite impact basins and Jupiter has been analyzing the structural and stratigraphic relationships of the tectonic landforms and impact basins. UGA published a press release highlighting this work.

This Fall, I managed to present a paper on Economic Clay deposits in Sile Turkey at the inaugural meeting of the Mediterranean Geosciences Union in Istanbul. A side trip with UGA Geology Adjunct Professor Isik Ece was made to Gobekli Tepe. We visited what I describe



Gobekli Tepe - 12,000-year-old human community site

as the first Critical Zone landscape impacted by Humans. The recent recovery of ancient site artifacts suggests that well-organized and sizable human communities were well in existence at least 12,000 years ago during the Pleistocene. The photo inset reveals the impressive and large structures made using only stone tools. Wild barley was cultivated from the wetlands of the



WRRS Lab at AGU

Tigris River and animal life was "cornered" into areas, which marks the first appearance of livestock and agricultural practices. As geologists, we must thank these early cultures for taming such things as barley and all the products that have since been invented and have become dear to a geologist's lifestyle.

The Geology department was represented at GSA and AGU this year. The inset photo shows the UGA Geology Water Resources Group out in force at the New Orleans C Convention Center. Here are some authors and their talk titles: **Adam Milewski**: *Development of Hydrograph Analysis Techniques for Ephemeral and Intermittent Transmission Loss Modeling*. **David Richards**: *Remote-Sensing Based Salt Marsh Monitoring of Southeast Coast Network*. **Yannie Donaldson**: *Three-Dimensional Forward and Inverse Modeling to Simulate* Geoelectric Response to Lateral Water Flow in a Topography Induced Inland Freshwater Lens. **Fabian Zowam**: A Satellite-based Approach for Quantifying Terrestrial Water Cycle Intensity (WCI) and evaluating its impact on Groundwater Recharge Potential Across the Contiguous USA. Lea Davidson: Optimizing of Remote Sensing Technique for Ephemeral Channels: Quantifying Temporal Changes in Channel Flow within the Souss-Massa Basin, Morocco. Sarah Asher: Water Resource Inventory and Assessment Reports for the U.S. Fish and Wildlife North Mississippi Refuges Complex, and undergraduate Caroline Hiott: Evaluating Water Resources and Threats at The Carolina Sandhills National Wildlife Refuge Steffan Becker: Remote Sensing Approach for Dune Migration Measurement.

The Strat Lab was eager to get back in the field in 2021 with the lifting of UGA's COVID travel restrictions. They started the summer with a section-measuring clinic, focusing on Mississippian-Pennsylvanian strata of eastern Kentucky. Everybody soon spread to their summer field areas, all focusing on how stratigraphic architecture shapes the non-marine fossil record. Post-doc Katie Loughney studied Neogene mammals in extensional basins of Nevada, and master's students were scattered across the western United States: Anik Regan in the Cretaceous Judith River Formation of Montana. Khatri Samantha at the Cretaceous-Paleogene boundary in North Dakota, Max Deckman in the Triassic Chugwater Formation of central Wyoming, and Elliot Blake in the Jurassic Sundance Formation of north-central Wyoming. Undergraduate Alex Smith returned with concretions from the Hell Creek formation and examined them along with me using XRD and thin sections. In the





fall, the Strat Lab made a weekend trip to Sapelo Island to study modern sedimentary environments. It was great to be back in the field!

Some say that "the best geologists are those that see the most outcrop", so I am including field photos that have been sent by faculty from places they visited this past year. Please enjoy the images and take care.

Paul Schroeder Professor and Head



Perito Moreno Glacier Photo by Sally Walker

Mt. Fitz Roy, Patagonia Photo by Sally Walker



Missouri Breaks Montana Photo by Steve Holland.





Stalagmite BZB-O3: Bega One Cave in Belize collected by Pete D. Akers. Inferred is a climate change from dry to wet to dry. Photo By Bruce Railsback The photo was taken from Georgia Mountain Center near Blairsville - where Rob Hawman does education/ outreach. The peak in the distance is Coosa Bald, elevation 4271 feet



Necropolis, Urfa, Turkey, largest known site used for burial. Portals are carved into Middle-Upper Eocene Limestone (Firat Formation). Photo by Paul Schroeder

