Council on Undergraduate Research – Geosciences Division

2022 GeoCUR Award For Excellence in Student Research

Amelia Muscott, Occidental College

Geology, Nominated by: Dr. Christopher Oze

Amelia Muscott has been an exemplary student with regards to research and student mentoring/tutoring. Additionally, she was the recipient of the prestigious Norris Scholar award at Occidental College for her research in sedimentology and climate change.

Katelyn Rusiniak, Indiana State University

Earth and Environmental Systems, Nominated by: Dr. Jennifer Latimer

It is my pleasure to nominate Katelyn Rusiniak for the GeoCUR Award for Excellence in Student Research. Katelyn is an Honors student with a double major in chemistry and biology, and she has worked in my biogeochemistry research laboratory since her first semester at ISU. Over these four years, Katelyn has studied metals in fish, otters, water, and sediment as well as macroinvertebrate assemblages to try to better understand water quality. Last summer, along with a Ph.D. student, she traveled the entire length of the Wabash River, beginning at the headwaters and collected samples systematically along the way for her summer research project. Katelyn is an excellent student and scientist, and she will start medical school in the fall. She has presented her research at the Indiana Academy of Sciences Annual Meeting, NCUR, and as part of the Smithsonian traveling exhibit, Waterways. She will also present her research at Posters on the Hill in April 2022.

Meagan Walker, West Virginia University

Geology and Geography, Nominated by: Dr. Amy Hessl

Radiocarbon (14C) dating has been used to date carbon-rich objects in Earth sciences since the 1940's but until recently, dating estimates included uncertainties ranging from decades to centuries. Meagan Walker has used a recently discovered spike in 14C production in 773 CE (Miyake Event) to confirm annual dates of poorly resolved tree ring records from Tasmania, Australia. Her work has allowed hundreds of records previously floating in time to be pinned down to the year. She completed the work independently including sectioning wood samples into 15 micron-thick shavings, performing holocellulose extractions and preparing samples for analysis by a mass-spectrometer. Her continuing work, comparing results from multiple species at the same site, will help define the strength of the solar proton event that resulted in elevated 14C production. Meagan has presented her work at West Virginia Undergraduate Research Day at the Capitol (Feb 2022) and has an accepted abstract at WVU's Spring Symposium (Apr 2022). She was awarded a 2022 West Virginia NASA Space Grant Consortium Scholarship ($1000) in support of her work and is currently completing a first-authored manuscript to be submitted to a peer-reviewed journal in May 2022. She is an outstanding undergraduate scholar. Of the more than 25 undergraduate researchers I have supervised in my career, Meagan is the stand-out. Her curiosity, drive, and knowledge of the Earth Sciences combined with a willingness to take risks is just the right recipe for the next generation of geoscientists.

Emily Kaiser, DePauw University

Geosciences, Nominated by: Ken Brown

The Department of Geosciences at DePauw University would like to nominate senior environmental geoscience major, Emily Kaiser, for the GeoCUR Excellence in Student Research Award. During the summer of 2021, Emily completed a collaborative research project under the supervision of Dr. Tim Cope that was aimed at characterizing conodont microfossils from local outcrops of Ste. Genevieve limestone within DePauw's Nature Park. Through her research efforts, Emily not only helped devise and refine a method for separating conodonts from limestone, but also catalogued, identified, and archived the conodont specimens her team collected from the local limestone outcrops. Emily continued to pursue her research by completing an independent study credit during the fall of 2021. This work resulted in the development of a collaborative relationship with a conodont expert at the Iowa Geological Survey. She also presented her research at the DePauw Science Research Fellows fall symposia and defended her independent research to department faculty. Beyond being a dedicated student researcher, Emily is a member of the DePauw's Swim Team, Sustainability Leadership Program, and Environmental Fellows Program.

Lillian Minnebo, Grand Valley State University

Geology, Nominated by: Dr. Ian Winkelstern

Lillian Minnebo is currently a senior Geology major at Grand Valley State University. The GVSU faculty want to recognize Lillian as an exemplary undergraduate researcher with strong quantitative, analytical, and presentation skills. I have worked with Lillian since 2019 on two research projects centered around the paleoclimatology and Interglacial stratigraphy of Bermuda. Lillian showed strong promise as a researcher from the start. In early 2020 she helped write a proposal and received competitive funding to conduct fieldwork and isotopic analyses that summer. With the pandemic making this suddenly impossible, Lillian rapidly pivoted at a time when other students (reasonably!) dropped their research efforts. Instead of the planned work, she tackled a challenging sediment age dataset involving amino acid racemization– made even more challenging by having never seen the stratigraphy herself. She presented this work at virtual AGU 2020, laying the necessary foundation for future climate-focused work. Lillian received a second round of funding in 2021 to work on a related set of fossil oysters from the Last Interglacial of Bermuda. She developed a detailed stable isotope sampling plan, executed it, spent time in the lab (including some vacuum line experience), and finally analyzed and graphed the data herself. This work culminated in an impressive poster presentation at GSA in Portland, and the work is being prepared for publication with Lillian as first author. She showed that oyster shells can preserve vital paleoclimate data, and advanced our understanding of North Atlantic climate 125,000 years ago.

Micah Char, Chapman University

Environmental Geochemistry, Nominated by: Dr. Christopher Kim

Micah has played a key role in a wide range of research projects in the Kim Environmental Geochemistry (KEG) Lab at Chapman University. From working with abandoned gold mine tailings to explore arsenic bioaccessibility as a function of particle size and weathering to synthesizing and assessing iron oxyhydroxide nanoparticle aggregation and metal ion sorption, Micah has been an invaluable contributor to the lab's research projects and mission. He is highly deserving of this recognition by GeoCUR.

Christopher Goldmann, Trinity University

Geosciences, Nominated by: Dr. Brady Ziegler

Chris has proven to be an exceptional researcher who is always up for a challenge. His research focuses on a GIS-based analysis of the geochemical controls on manganese in groundwater in the Shenandoah Valley. The scope of Chris's research is all the more remarkable when you learn that he had never taken a geochemistry or GIS course when he started his project. But Chris can persevere, and does not shy away from a challenge. His resourcefulness and determination are bar none. Aided by these qualities, Chris has produced a complex geospatial, statistical, and geochemical interpretation of how manganese is mobilized into groundwater. In short, Chris has shown that upwelling of old groundwater through organic-rich shales mobilizes manganese in near-surface groundwater in the center of the Shenandoah Valley. Through his research, Chris has demonstrated a maturity and desire to discover new knowledge that makes him a uniquely exceptional undergraduate researcher, and I am honored to have mentored him and learned so much from him through this project.