

Ruixiang Zhai, Boston College, Chestnut Hill, Massachusetts, USA for their project: *Investigating the role of phototrophic communities in carbon burial during Oceanic Anoxic Event 2*.

Ruixiang Zhai is a Ph.D. student in the Department of Earth and Environmental Sciences at Boston College, where he works with Professor Xingchen T. Wang. He is also a visiting student fellow in the Department of Earth and Planetary Sciences at Harvard University, working with Professor Ann Pearson. His research spans biogeochemistry, paleoclimatology, and geobiology, with a focus on using stable isotopes and organic geochemical tools to understand ancient ocean deoxygenation, biogeochemical cycling, and climate change. Before beginning his doctoral studies, he earned an honors B.S. in Marine Science, specializing in geological oceanography, from Xiamen University, China.

His Howard and Jean Lipman Foundation Student Research Grant project, "*Investigating the Role of Phototrophic Communities in Carbon Burial during Oceanic Anoxic Event 2*," examines why the Cretaceous Oceanic Anoxic Event 2 (OAE2), approximately 94 million years ago, produced widespread but uneven accumulation of organic-rich black shales. Ruixiang hypothesizes that shifts in phototrophic community composition controlled how efficiently organic carbon was exported from surface waters and preserved in marine sediments. He will reconstruct phototrophic communities using compound-specific nitrogen isotope measurements of sedimentary geoporphyrins from three drilling sites spanning the proto-North Atlantic, proto-Indian, and Pacific oceans. By integrating these records with bulk nitrogen isotopes, total organic carbon, carbon burial rates, and organic carbon isotopes, the project will test whether eukaryote-dominated communities coincided with enhanced carbon burial. This work aims to establish a mechanistic link between marine ecology and the biological carbon pump under extreme greenhouse conditions, with implications for understanding other ancient hyperthermal events and the ocean's response to future warming.

