

The NASA Astrobiology Early Career Collaboration Award allowed me to travel to the University of Minnesota in Minneapolis for two weeks. There I conducted research on Archean microfossiliferous cherts from the 2.5 Ga Gamohaam Formation of South Africa. I worked with Dr. Xinyuan Zheng in his isotope geochemistry lab, where we utilized inductively coupled plasma mass spectrometry (ICP-MS) to measure the silicon isotope ratios and REE+Y concentrations of my chert samples. The data gathered provides new context for the changing depositional environment of the Gamohaam formation, and helps to constrain the potential metabolisms of the fossil microorganisms preserved in the unit.

During my two weeks in Minneapolis, I worked closely with Dr. Zheng, as well as several members of his lab, Ruipeng Zhao and Weiming Ding. With their help, I was able to process all 38 of my samples through alkali fusion and silicon isotope column chemistry. In doing so, I gained valuable clean-lab experience, as well as experience with the ICP-MS instrument.

By facilitating my trip to Minneapolis, The Astrobiology ECCA not only allowed me to meet my objectives by collecting the data that will make up an important part of my PhD dissertation, but it also gave me the opportunity to make connections with researchers beyond my home institution. Over the coming semester, I plan to analyze the data I collected during my trip, before presenting it at AbSciCon in May of 2026.



Figure 1: (Left) Samuel Hall (Me) in the Zheng Isotope Geochemistry Clean-Lab, wearing my yellow clean suit, (Right) column chemistry apparatus for silicon isotopes.