2018 Outstanding Student Researcher

Khanh Luu  
Major: Geology, B.S.  
Faculty Mentor: Dr. Erik Melchoirre

Title: Isotopic and Geochemical Evidence for Organic Preservation in Stichtite

Each year, the OSR recognizes one student that has stood out among their peers for their research and academic achievementst. Selected as this year’s Outstanding Student Researcher, Khanh Luu is an undergraduate student pursuing a degree in Geology. Accepted into CSUSB as a Presidential Scholar, Khanh has actively participated in research projects with faculty, and is currently being mentored under the supervision of Dr. Erik Melchoirre. As this year’s recipient, Khanh will speak about her research during the Recognition of Student Researchers Luncheon on May 18th.

Abstract: Stichtite, a magnesium-chromium hydrotalcite mineral associated with serpentine, preserves a record of past environmental conditions by trapping organic material within its crystal lattice. Organic compound identification of material trapped within the molecular interlayer of stichtite reveals a complex profile of molecules similar to modern soils. Some of these molecules are not associated with modern environments or contamination sources. Furthermore, this organic material has $\delta^{15}N$ values similar to marine kerogen. The organics from stichtite and ancient chert follow a similar trend of lighter $\delta^{15}N$ values and less stored organics in Archean-aged samples, vs. heavier values and more organics in the younger samples. Thus, stichtite is inferred to have preserved an organic and nitrogen isotope signature from the serpentinizing conditions in which it formed in deep-Earth time. This confirms results from earlier work on chert, which established that life was present in marine rocks dating back at least 3.4 billion years. Given that stichtite can preserve organic molecules from serpentinizing environments, where life is suspected to have begun, stichtite should be considered a possible biomarker for studies of the serpentininite known to exist on Mars.
**Title:** “Je dis que rien ne m’épouvante” from the opera Carmen by Georges Bizet

The CSUSB Opera Theatre is an auditioned ensemble that stages a major opera production on campus every year. The innovative, modern and zany adaptations of both standard operatic repertoire and new operatic works that have been produced by the CSUSB Opera Theatre have led to sold out performances, as well as rave reviews across the Inland Empire community. The CSUSB Opera Theatre is a proud six-time recipient of the City of San Bernardino Fine Arts Commission grant. This past season the CSUSB Opera Theatre presented the world premiere performance of an abridged adaptation of Einstein on the Beach by the iconic composer Philip Glass and renowned performance artist Robert Wilson.