

FYRE First Year Research Experience

Mark Krekeler in Geology is looking for First Year students to become part his research projects through the new FYRE program.

To apply, e-mail Martha Weber at weberme@muohio.edu

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ASSISTANT PROFESSOR, GEOLOGY



Investigation of unusual phosphorescent calcite

Blue phosphorescent calcite is rare and caused by rare earth elements in the crystal structure. Recently this type of calcite was found near Hillsboro, Ohio in altered fossil coral. Calcite crystals are 1 to 10 cm in diameter. There may be connections to the nearby serpent mound meteorite impact site as this may be a source of rare earth elements. This project involves two separate days of guided field study, hand sample description and basic laboratory work. Two to three freshmen are sought for the project which will span the 2009-2010 academic year. During the project students will read approximately 20 papers, learn sample preparation and basic analytical techniques, contribute to the writing of a peer-reviewed journal as a co-author and present the project as a group at a professional meeting. A time commitment of 3 to 5 hours per week is required. Field trips will be 10-12 excursions on weekend days with transportation provided. Freshmen with interests in geology, mineralogy, gems, chemistry, and physics are sought.

Recycle high value material from disposable batteries

Disposable alkaline batteries are a major waste stream in landfills globally. Producing high value materials from recycled alkaline batteries is critical to reducing this waste stream. Initial investigations of heating of some materials from a single brand of spent alkaline batteries indicate that a possible high value catalyst and separation media is produced. Several directions of research are possible including work to increase purity of product, identify most appropriate uses, and challenge experiments. Two to three freshmen are sought for the project which will span the academic year. During the project students will read 30-40 papers, learn sample preparation and basic analytical techniques, contribute to the writing of a peer-reviewed journal as a co-author and present the project as a group at a professional meeting. A time commitment of 6 to 8 hours per week is required. Freshmen with interests in mineralogy, chemistry, engineering and physics are sought.

Investigation of Yucatán beach sand

This project entails basic chemical and mineralogical analysis of beach sands for the purpose of use in ecologically engineered constructed wetlands to prevent sewage pollution throughout the region. Beach sands are better for mechanically filtering bacteria and are more reactive with pollutants compared to existing substrates. Two to three freshmen are sought for the project which will span the academic year. During the project students will read 20 – 30 papers, learn sample preparation and basic analytical techniques, contribute to the writing of a peer-reviewed journal as a co-author and present the project as a group at a professional meeting. A time commitment of 6 to 8 hours per week is required. Freshmen with interests in human health, geology, ecology, coastal environments, mineralogy, and civil and environmental engineering are sought.