

# BayCEER Kolloquium

Lectures in Ecology and  
Environmental Research

Winter 2022



UNIVERSITÄT  
BAYREUTH

Donnerstag/Thursday

**08.12.2022**

**12:15 in H6, GEO**



## Dr. Muammar Mansor

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## Microbial-mineral interactions: Formation of pyrite and implications for biosignature and environmental research

Microbe-mineral interactions affect the biogeochemical cycling of various elements (Fe, S, C, N, P, trace metals, nutrients, contaminants), the evolution of life, and the preservation of minerals that hold clues to conditions on Earth's past and potentially in other habitable worlds. The mineral pyrite ( $\text{FeS}_2$ ) in particular is prevalent in nature due to the activity of Fe- and S-cycling microbes, making them promising for applications in the field of biosignatures and environmental remediation. However, decades of research with microbial cultures have revealed difficulties in forming pyrite in the lab, despite biogenic pyrite being formed everyday in sedimentary environments on Earth.

In this talk, I will present recent advances in microbially-mediated formation of pyrite and its Fe sulfide precursors (mackinawite, greigite). The role of different microbes and interrelated Fe-S chemistry in impacting pyrite formation will be discussed. Recent advances highlight the need to develop systems that better reflect the complexity of natural environments to form pyrite with properties that are relevant for environmental and geological research.

