Earth Sciences Colloquium Series

Presents

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Date: Wednesday, February 15, 2023
Time: 1:30 PM
Location: BGSB 1056

How hot and wet is the Moon: insights and challenges

Two fundamental aspects of the moon that remain poorly constrained are the thermal profile of its interior and the bulk water abundance. The thermal profile of the interior (selenotherm) is key to understanding the internal structure and evolution of the Moon while the bulk water abundance is important to constrain the dynamics of Earth-Moon formation and the origin of volatiles in the Earth-Moon system. In this talk, I will present the current challenges in constraining the selenotherm using abundances of heat-producing elements (HPEs) from returned samples. Specifically, I will discuss a new approach using high pressure-temperature experiments that investigate the behavior of HPEs during magma ocean crystallization. I will further demonstrate that the partitioning behavior of water between the magma ocean and its cumulate minerals is key to determine the bulk abundance of endogenous lunar water. I will conclude with the directions we are pursuing in my research group to address these first-order challenges in determining the bulk water abundance on the Moon, and insights we may obtain from new measurements and sample returns.

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