

The Keck Institute for Space Studies  
presents the following lecture:

# **FLOAT & SWIM**

## **Novel Meso-Scale Robots for Extreme Lunar and Ocean World Environments**

Ethan W. Schaler, PhD  
Jet Propulsion Laboratory

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Monday, July 11, 2022

4:30 PM Refreshments  
5:00 PM Lecture

Lees-Kubota Lecture Hall  
101 Guggenheim Lab  
California Institute of Technology

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As NASA seeks to explore ever-more extreme environments in the coming decades, two NASA Innovative Advanced Concepts (NIAC) studies – FLOAT and SWIM – investigate novel solutions for the unique environmental, operational, and design constraints imposed on two types of robots operating on the Moon and Ocean Worlds.

For FLOAT – Flexible Levitation On A Track – we consider the challenges of building the first lunar railway system, to provide reliable, autonomous, and efficient payload transport on the Moon in support of ISRU (in-situ resource utilization) and ECO (excavation, construction, and outfitting) activities. Our proposed platform uses dozens to thousands of passively-levitating magnetic robots that are controllably propelled over a flexible film track.

For SWIM – Sensing With Independent Micro-swimmers – we study the idea of using dozens of miniature underwater robots, each approximately the size of a cell phone, to characterize the physical / chemical properties of ice-ocean interfaces on Ocean Worlds in search of signs of extant life.

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Seating is limited and is available on a first come, first served basis.

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