



# Colloquium Notice

**Edwin Kite**

**University of Chicago**

## *Mars and the Problem of Planetary Habitability*

Can we identify simple rules for planetary evolution? Are the processes that generate planetary habitability common or rare? To answer these questions, Mars exploration is vital. What allowed rivers and lakes on Early Mars, which received just 1/3 of the modern Earth's insolation? And why did Mars' surface become uninhabitable? I will explain how data from spacecraft missions reveal a rich stratigraphic record of climate-sensitive deposits, allowing models to be tested. We have found that the greenhouse effect of high-altitude water ice clouds is a possible explanation for the warm climates - but only if the surface was arid, consistent with the geologic record. While lake-forming climates on Mars occurred over a time span of >1 Gyr, now Mars's surface is too cold and dry for life. I will discuss ways in which Martian surface habitability could be re-enabled.

Finally, I will preview planned observations with James Webb Space Telescope to check for atmospheres on rocky exoplanets and - for the first time - take a spectrum of a rocky exoplanet's surface.

Monday  
**November 15, 2021**  
Starts at **12:15 pm**  
**Zoom**