



# DEPARTMENT OF PHYSICS AND ASTRONOMY

## COLLOQUIUM **IN-PERSON ONLY EVENT**



### Elemental Abundances Influence Planet Formation and Rocky Planet Evolution

#### **Kiersten Boley**

NASA Sagan Fellow  
Carnegie Observatories  
Washington, DC

Planet formation is fundamentally linked to the chemical evolution of the galaxy. For planet formation to occur, there must first be sufficient material within the protoplanetary disk. The growing number of planet discoveries have revealed distinct planet populations (e.g., lava worlds, water worlds, etc.). These populations suggest a diversity of compositions and formation mechanisms that arise from variations in the initial conditions. As more data from spectroscopic surveys becomes available, we can constrain the materials from which planets form and how that impacts their long-term evolution. In this talk, I will show how changes in the planet birth environment controls when and where planets form in the Milky Way and what that tells us about their likely formation mechanism. I will also present the first evidence for a strong dependence of super-Earth formation on iron abundance. Using the material properties inferred from their birth environment, I will lastly describe how planet composition impacts the long-term evolution of rocky planets through the lens of mineral physics.



**Thursday, February 19, at 2:55 PM**  
**IN-PERSON EVENT ROOM 202**

Local Contact: Dr. Inseok Song, [song@uga.edu](mailto:song@uga.edu)