



2023 Amelia Earhart Fellow

# Maizey Benner



**Citizenship:** United States

**Proposed Program:** Planetary Sciences at the University of Arizona, USA

Ms. Benner is a Ph.D. student at the Lunar and Planetary Laboratory (LPL) at the University of Arizona. She is a member of the planetary materials research group, where she couples experimental cosmochemistry and computational thermodynamics to better understand the origins and evolution of moderately volatile elements in the early solar system. Ms. Benner uses electron microscopy techniques such as electron microprobe, focused-ion beam scanning-electron microscopy, and transmission electron microscopy to probe the chemistry and structure of materials from the micro- to nanoscale. In the computational space, she uses density functional theory to calculate the thermodynamic properties of materials for use in models of solar condensation. These two are linked by comparing experimental results to computational models of materials and iterating until they replicate the natural system.

Her current research focus is on the origin and evolution of phosphorus-bearing materials in ordinary and carbonaceous chondrites. These chondrite groups represent two reservoirs of material from the beginning of solar system history that are mostly unaltered since their formation. Probing these pristine materials allows her to evaluate the most primitive phosphorus-bearing materials and evaluate their thermodynamic conditions of formation for refinement of the solar condensation sequence.

Ms. Benner did her undergraduate education at Purdue University in Applied Physics Honors and Planetary Science, where she served as a teaching assistant and department student representative. She continues these service and teaching efforts at the University of Arizona, where she continues to teach introductory astronomy classes, serves as a co-organizer for the PLANETS organization for marginalized genders in space sciences, and a student member of the department life committee.

Ms. Benner is passionate about creating a supportive environment for marginalized genders at the University of Arizona and in the broader microscopy community. Outside of her studies, Ms. Benner enjoys practicing yoga, baking, and reading.