The Great Lunar Expedition for Everyone: Demonstrating Microsatellite Sensing Networks in Planetary Science Julia Claxton (she/they)[1], Julia Sheeran (she/her)[2], Victor Andersen[3], Barbra Sobhani[3] and the GLEE Team[3], [1]University of Colorado Boulder (julia.claxton@colorado.edu), [2]University of Colorado Boulder (julia.sheeran@colorado.edu), [3]University of Colorado Boulder

Introduction: The Great Lunar Expedition for Everyone (GLEE) is a NASA-funded mission to demonstrate a new modality for planetary science data collection using a large network of inexpensive sensing packages to record physical measurements at multiple points simultaneously on a planetary surface. The GLEE mission will deploy 250 solar-powered 5 cm x 5 cm sensing boards, called LunaSats, over approximately 300 square meters on the Lunar surface. Each LunaSat will autonomously record and transmit thermal, magnetic, acceleration, and regolith capacitance data over 6 Lunar hours (one Earth week) using a radio mesh network. The LunaSat network will produce hundreds of simultaneous timestamped datasets that will be used to construct time-varying spatial maps of Lunar phenomena on the meter scale with millisecond temporal resolution, providing critical characterization of the Lunar environment for future human exploration and settlement missions.

This poster describes the current state of the GLEE project and identifies GLEE's scientific potential, including hardware testing results, LunaSat technical specifications, and open questions in the field that GLEE may help address. We also identify previous literature citing the need for inexpensive, massively deployable microsatellite technology such as the LunaSat in planetary science. GLEE will demonstrate a novel form of distributed data collection - a type of study not possible with current single-instrument missions - unlocking new scientific horizons and helping to kickstart the next era of planetary science.