SPACE EXPLORATION SYMPOSIUM (A3)
Moon Exploration – Part 1 (2A)

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# EXOSPHERIC AND SURFACE LUNAR SCIENCE ENABLED BY CUBESATS AND SMALLSATS

**Abstract**

Critical scientific questions about the Moon could be answered with appropriately scoped investigations onboard Cubesats and/or Smallsats. We will describe two recent Cubesat mission efforts proposed to NASA's Small Innovative Missions for Planetary Exploration (SIMPLEx) program. The concepts were designed to answer important questions about the balance of source and loss processes in the inner Solar System, including: 1. What is the relative role of micrometeoroid and solar wind impact energization in supplying the lunar atmosphere with volatile and refractory elements, and 2. How do the liberated exospheric species relate to the surface regolith composition and loss processes? Such Cubesat investigations would build upon recent pathfinding LADEE and Kaguya measurements, which suggest that the content of the exosphere is not constant throughout a year. New measurements will enable an improved causal link between the space environment parameters and the lunar exosphere by "extending our temporal coverage of the exosphere to a part of an Earth year not previously measured.