Executive Summary

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Presentation Title

Management of Future Lunar Samples: Back to Basics

Key Ideas

The wholesale differences between the Apollo Missions and the Lunar surface science activities implicit in NASA's proposed lunar architecture argue for a logical re-evaluation of handling of samples on the lunar surface. This evaluation must be based on potential lunar mission sets, on a consideration of what capabilities different mission sets will place on the lunar surface, and the time available to execute sample handling in-situ. Even with the most optimistic return sample mass, the sample mass and petrologic variety implicit in multi-week lunar surface stays argues that some level of sample analysis and description must take place on the surface in order to select the correct sample suite for Earth return. The trade space that can be mapped out is relatively straightforward, but requires careful consideration of 1) what analytical capability may be reasonably brought to the lunar surface; 2) what accommodations must be undertaken to both protect sample quality and minimize introduction of regolith into pressurized spaces; and, 3) what sample handling capability can reasonably be developed, taking into account lunar surface downmass, realistic robotic technology, realistic surface outfitting penalties on crew time, and budgetary realities for hardware development.