NASA SBIR/STTR Technologies

High-Fidelity Lunar Dust Simulant

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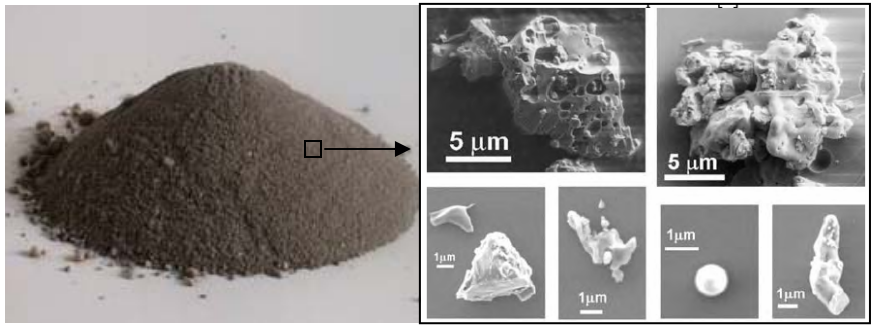
Proposal No: 07-1 X7.04-9706

Identification and Significance of Innovation

ORBITEC proposes to develop a family of High-Fidelity Lunar Dust Simulants that will better match the unique properties of lunar dust than existing simulants (such as JSC-1AF). Current lunar dust simulants do not have enough of the very fine particles, and they lack the agglutinitic glass and complex surface textures that dominate lunar dust. The proposed family of High-Fidelity Lunar Dust Simulants will approximate the size, morphology, composition, and other important properties of lunar dust.

Expected TRL Range at end of contract (1-9): 4



Technical Objectives and Work Plan

The overall objective of the Phase 1 effort is to demonstrate the technical feasibility of manufacturing a new high-fidelity lunar dust simulant that better matches the unique properties of lunar dust than existing simulant materials.

Task 1. Define the Requirements for the High-Fidelity Lunar Dust Simulant
Task 2. Prepare the Feedstock Material for the High-Fidelity Lunar Dust Simulant
Task 3. Conduct a Grinding Feasibility Test
Task 4. Create a Prototype Lunar Dust Simulant
Task 5. Characterize the Prototype Lunar Dust Simulant
Task 6. Project Management and Reporting

NASA and Non-NASA Applications

High-fidelity lunar dust simulants will be needed to verify the effectiveness of dust mitigation strategies and technologies for extravehicular mobility suit material composition and cleaning operations, lunar habitat construction design, mechanical performance (radiators, seals, valves), electrical performance (tools and equipment), landing operations (vision systems), and all manners of surface operations. Since this simulant will also contain the critical metallic iron component (including “nanophase” iron) along with the morphology of true lunar dust, it will also be applicable to human health and toxicity studies.

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