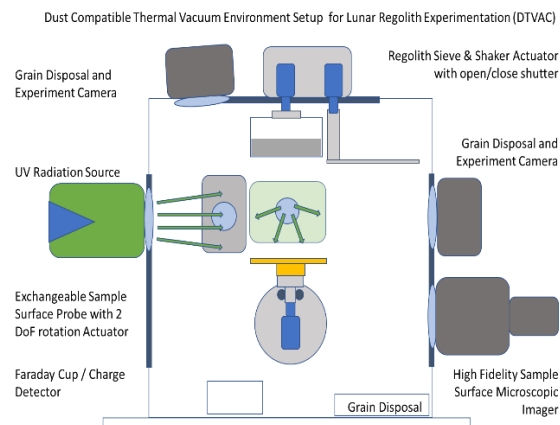


Master Thesis Announcement

Entwurf und Entwicklung eines High-Fidelity Teststands für lunare Staubadhäsion

Design and Development of a High-fidelity Lunar Dust Adhesion Test Bench

In light of the growing interest in lunar surface missions by various private and governmental organisations, the study of the lunar surface environment has emerged as a highly compelling research area for investigation and simulation. One notable aspect of this environment is lunar dust. Previous lunar missions have recognised lunar dust as a significant challenge owing to its pronounced adhesive properties to surface materials. Investigating the characteristics of lunar dust is crucial for understanding and reducing adhesion on the surfaces of exploration instruments. Factors such as Van der Waals forces of the materials, electrostatic forces, Radiation impact, vacuum conditions, and temperature on the Moon must be simulated using lunar dust simulants derived from diverse regions of the Moon's surface.



This thesis focuses on designing a test bench that simulates the lunar surface environment within a Thermal Vacuum (TVAC) chamber, based on an existing low-fidelity test bench. The design involves selecting test instruments such as a Camera/Microscope, lighting elements, and sensors. The test bench must comply with the NASA-STD-1008 standard.

Tasks:

- Familiarisation with the lunar environment and dust properties;
- CAD design of the test bench using Siemens NX 12;
- Assessment and selection of test bench instruments;
- Realisation of the test bench with the available instrument;
- Documentation and assessment of the resulting design.

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