



# Exolith Lab

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## Introduction

Established in 2018, the Exolith Lab is a space hardware testing and regolith research facility managed by the Florida Space Institute at UCF. The lab uses regolith simulants in research areas such as in-situ resource utilization (ISRU) and biology and operates two testbeds for conducting hardware testing in regolith simulants.

## Regolith Research

Areas of research at Exolith Lab include

- Geotechnology: measuring regolith angles of repose, shear and compression strength
- Manufacturing: sintering using solar power, microwaving
- Biology: Soil remediation studies involving plants and worms
- Plume-surface interaction



## CRATER Testbed



- 10 m x 10 m test bin
- Filled to 1m depth with 120 tons of Lunar Highlands regolith simulant (LHS-2E)
- Variable custom terrain (craters, hills)
- 9 m x 4 m door opening
- 2-ton overhead crane
- Static gravity offloading capabilities; currently working on dynamic gravity offloading



## RIDER Testbed



- Testbed for single rover wheels
- 4 m long x 1 m wide x 0.5 m deep
- Utilizes high-fidelity Lunar or Martian regolith simulants
- Can accommodate rover wheel diameters from 30 cm to 100 cm
- Compaction to custom density profiles
- Environmental controls
- Electronic control and data logging



## Lunabotics

Since 2023, the Florida Space Institute and Exolith Lab have been proud to host the qualification round of the NASA Lunabotics Challenge. This is a university-level competition where teams of students design, build, and demonstrate a robot capable of excavating and transporting lunar regolith simulant. In May 2026, up to 50 teams from institutions across the United States will come to UCF and compete in the CRATER bin at Exolith Lab, with the top 10 teams going on to compete in the finals at Kennedy Space Center.



## Contact

For more information or to inquire about testing using CRATER or RIDER, please send an email to:

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