# Team 518: Movement Through Deep Regolith

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## Objective

Design a novel form of movement that can successfully traverse the lunar surface

## Background

- **Lunar Regolith** is sharp and adhesive
- Particle sizes range from 40-800 $\mu$m
- It clogs mechanisms and prevents functional movement
- Forms from meteorite impacts

Regolith Simulant from Marshall Space Flight Center

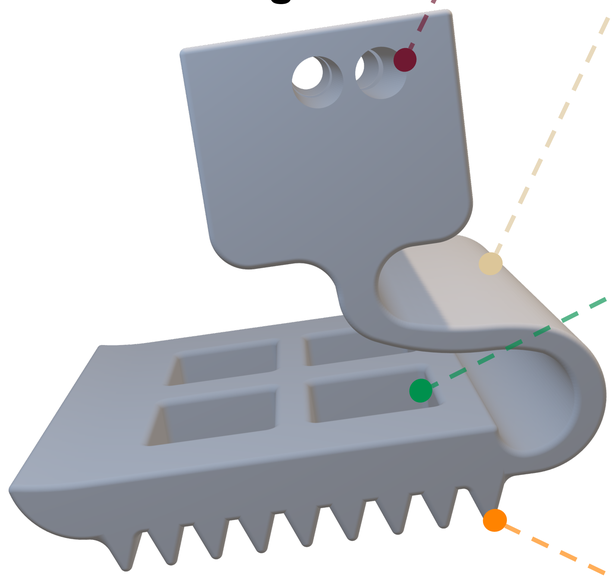
## Project Scope

- Easily attaches to **ET-Quad**
- Weighs less than 100 grams
- Prevents slippage
- Resists lunar regolith
- Limits lunar regolith displacement

## Future Work

- Optimize design features
- Conduct additional testing and validation
- Analyze results for the best design

## Selected Design



The final design consists of 3D-printed Nylon 12 Carbon Fiber filament

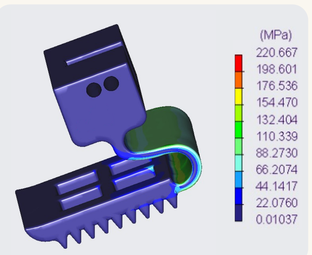
## ET-Quad Integration

- Attaches to leg mechanism
- Connects with M4-0.7 bolts
- Held in place with lock nuts

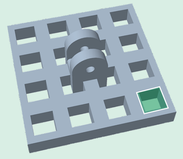
**ET-Quad** is a four-legged robot that can traverse various terrains. It was created at the Center for Intelligent Systems, Control and Robotics (CISCOR).

## Ankle Design

- Durable and compliant material
- Compresses to half the radius
- FEA confirms stress analysis
- Walking test validates function

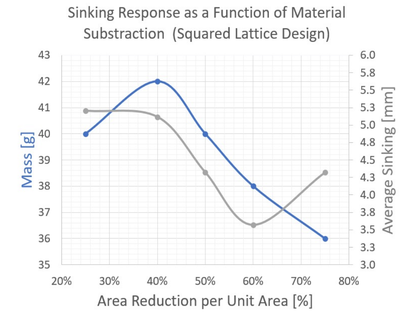



## Lattice Extrusion



60% area reduction per unit area was selected

- Reduces regolith plume
- Minimizes sinking
- Decreases mass




## Traction Feature

- Combines with lattice design
- Increases friction coefficients
- Helps minimize slip on lunar regolith