# 2026 NASA Lunabotics – ATHENA Payload Team

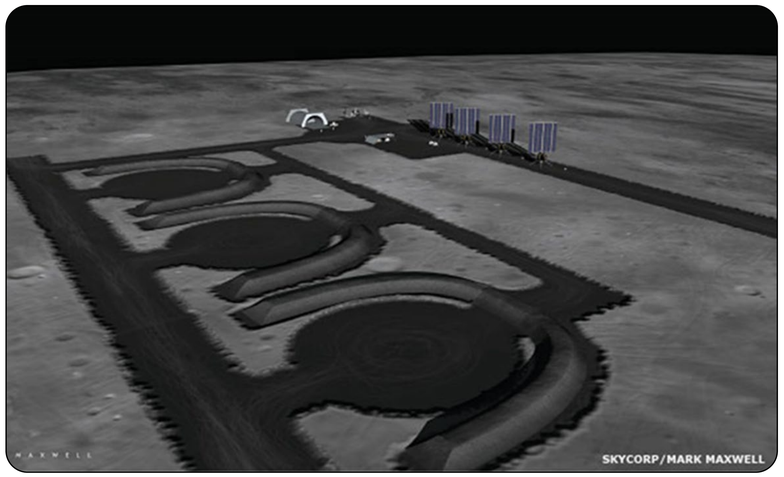
**Sponsor: SDSU Department of Mechanical Engineering**

Anil Mahadeo, Daniel Campos, Shane Turner, Nicolas Ulloa, Jeffrey Lin

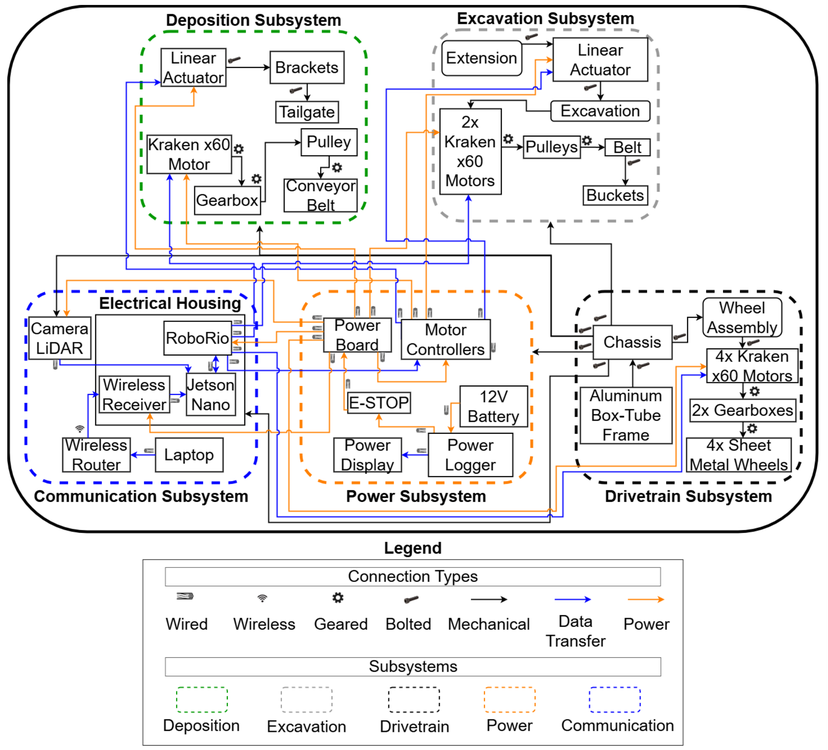
## Project Overview

Team ATHENA (Aztec Technology for Harvesting, Exploration and Navigation in Astro-Mining) adopted NASA's Systems Engineering Principles to build a lunar rover to compete in the 2026 NASA Lunabotics Competition against 50 other universities across the nation.

The Payload sub-team is responsible for the material handling systems on the rover: the excavation and deposition subsystems. These subsystems will collect and release regolith simulant from the simulated lunar surface to build small hills known as berms.

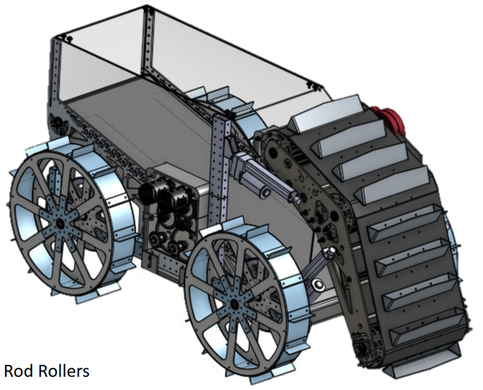


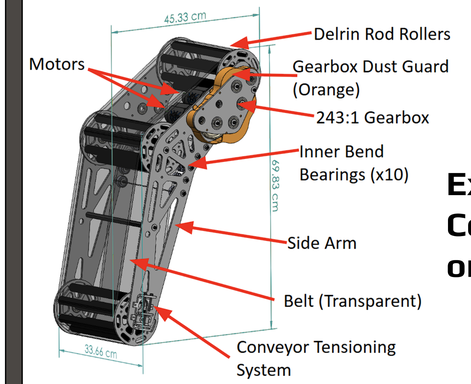

## System Level Diagram




## Mechanical Design

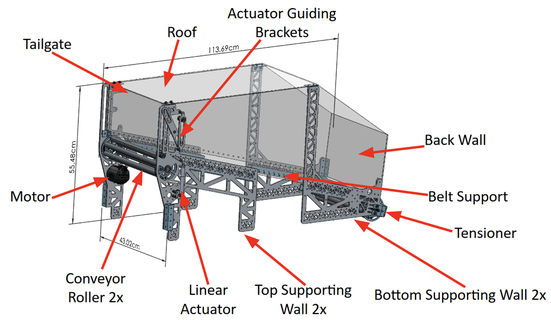
**Full Rover Assembled with Propulsion, Navigation, and Controls team**






**Excavation: Material Collection via Buckets on a Conveyor Belt**

**Deposition: Storage and Material Dumping via Conveyor Belt**




## Team Members

Back Row: Jeffrey Lin, Shane Turner, Daniel Campos
Front Row: Anil Mahadeo, Nicolas Ulloa

## Competition Requirements

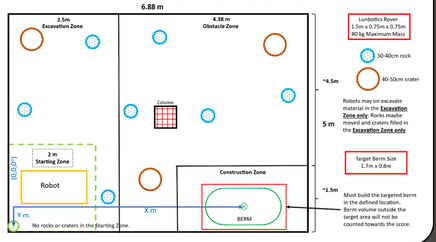
**Physical Constraints:** 150 cm (L) x 75 cm (W) x 75 cm (H)
May deploy to a maximum height of 250 cm during operations
Maximum system mass: 80 kg

**Power and Safety:**
Powered from onboard battery, easily accessible emergency stop
One lift point for every 20 kg of mass on the rover

**Control and Communication:**
Supports telerobotic and autonomous operations
Equipped with Wi-Fi hardware

**Excavation and Deposition:**
Collects regolith simulant from designated excavation zone
Deposits material to build berms in designated construction zone

**Artemis Arena**




## Acknowledgements

Image Credits: Lunar Landing Pads and Artemis Arena are from the 2026 NASA Lunabotics Guidebook. We would like to sincerely thank Dr. Scott Shaffar, Dr. Christopher Paolini, Dr. Marta Miletic, Eli Uva, William Traywick, and Montserrat Castel for their guidance and mentorship throughout the project. Thank you to OnShape, Progressive Automations, and SendCutSend for providing the team with services and support.

Spring 2026