

FAMU-FSU Engineering

# NASA Human Powered Rover

## Team 509: Ryan Floyd, Nicolas Picard, Ninett Sanchez, Andrew Schlar

### **Objective**

Design and manufacture a human powered vehicle to traverse exoplanetary terrain.

### Background

During the Apollo 14 lunar mission astronauts struggled to traverse through lunar terrain on foot and ran out of oxygen before completing all their tasks. The rover competition provides students with the opportunity to design a human powered rover for future lunar missions.

### **Objectives**

- Completely human powered
- Fit within 5 x 5 x 5-foot landing bay
- Full assembly in under 2 minutes
- Ground clearance > 12-inch
- Traverse uneven terrain with 5-foothigh hills and 30-degree inclines

### Competition

- 14 obstacles simulating lunar terrain
- 5 optional tasks representing astronaut mission
- 8-minute time limit represents theoretical oxygen supply

### **Vehicle Design**







- Coupled tiller steering: Allows both drivers to steer
- Double wishbone front suspension: Independent front wheel
  - movement helps maintain stability



- Side-by-side seating:
- Allows easy operator communication



- Polyurethane wheels:
- Lightweight and sturdy



**Rear-wheel drive:** 

Aids in uphill ascents



### **Notable Traits**

- Lightweight (Under 75 lbs)
- High torque (137 lbf-ft RWD) lacksquare
- Comfortable (Ergonomic seating/pedaling)
- Stable (Wide track of 5 feet) lacksquare

### **Future Work**

The final design will include forward located pedals, placing the operators in a recumbent bike position. Specific tools will be designed to complete the competition tasks, with a storage system for the tools incorporated on the rover. The rover will then be assembled and put through testing.

### Acknowledgements

Dr. Shayne McConomy Dr. Patrick Hollis Mr. Keith Larson Previous Team