



Ethan Hinds - Projects

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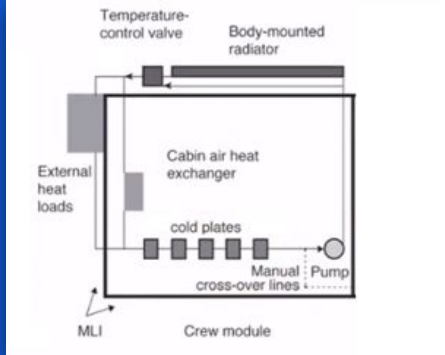
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# 2021-2022 AIAA Undergraduate Space Mission Design Competition

## Complete Project Requirements

- Design an Exploration Excursion Vehicle (EEV) for the Martian moons: Phobos and Deimos
- EEV must:
  - support 2 crew members to conduct scientific experiments on the moons
  - retrieve 50 kg of samples from each moon



## Thermal Control System

- Optimized system design to fit within mass and volume constraints
- Performed worst-case temperature study to ensure system integrity and crew safety



Exploration Excursion Vehicle

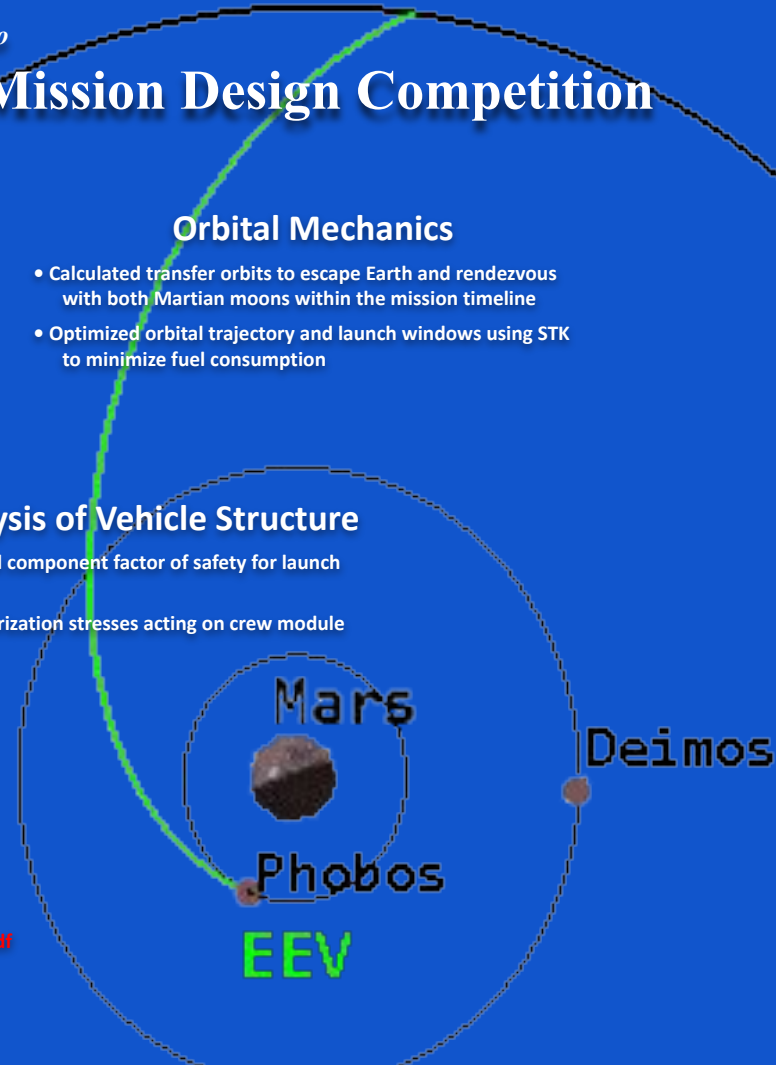
## Orbital Mechanics

- Calculated transfer orbits to escape Earth and rendezvous with both Martian moons within the mission timeline
- Optimized orbital trajectory and launch windows using STK to minimize fuel consumption

## Stress Analysis of Vehicle Structure

- Evaluated structural component factor of safety for launch and landing
- Analyzed air pressurization stresses acting on crew module

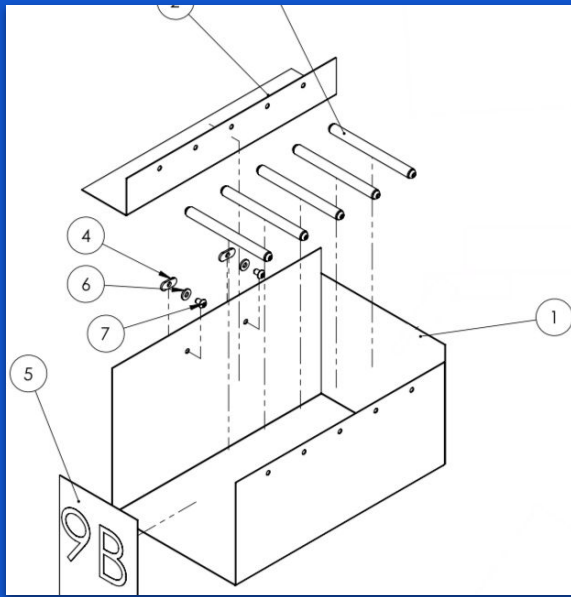
Read the full report at:  
[https://www.1023mla.net/Hinds\\_AIAA.pdf](https://www.1023mla.net/Hinds_AIAA.pdf)



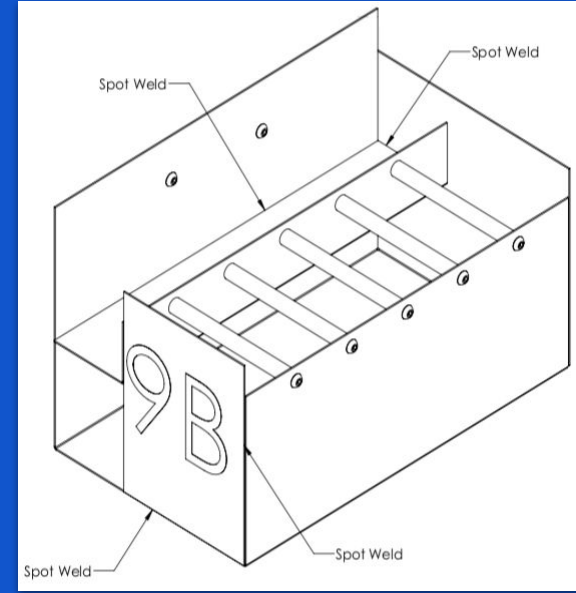
# 2020 Design and Manufacturing Lab Competition

## Project Requirements

*Design and manufacture a robot to navigate a course, pick up balls from a bucket, sort them, and release them by size*



- Designed arm to grab and lift the bucket of balls and drop them into the hopper
- Devised and modeled hopper to sort the balls and release them according to size
- Assembled components, mounting the hopper to the robot chassis



- Calculated estimated manufacturing time and costs
- Created step-by-step documentation of manufacturing process for the hopper and arm subsystems

Read the full report at:

[https://www.1023mb.net/Hinds\\_DML.pdf](https://www.1023mb.net/Hinds_DML.pdf)