

Mission Overview

- Design an Exploration Excursion Vehicle (EEV) for the Martian Moons: Phobos and Deimos
- The EEV shall:
 - Support 2 crew members
 - Crew stays inside the EEV
 - EEV conducts scientific exploration of the moons
 - Total mission time shall not exceed 30 days
 - Support sample retrieval from both destinations

Orbits & Mission Planning

- DST to Deimos to Phobos to DST
- 5.40 km/s ΔV total
- 2.35 km/s Insertion burn to Mars

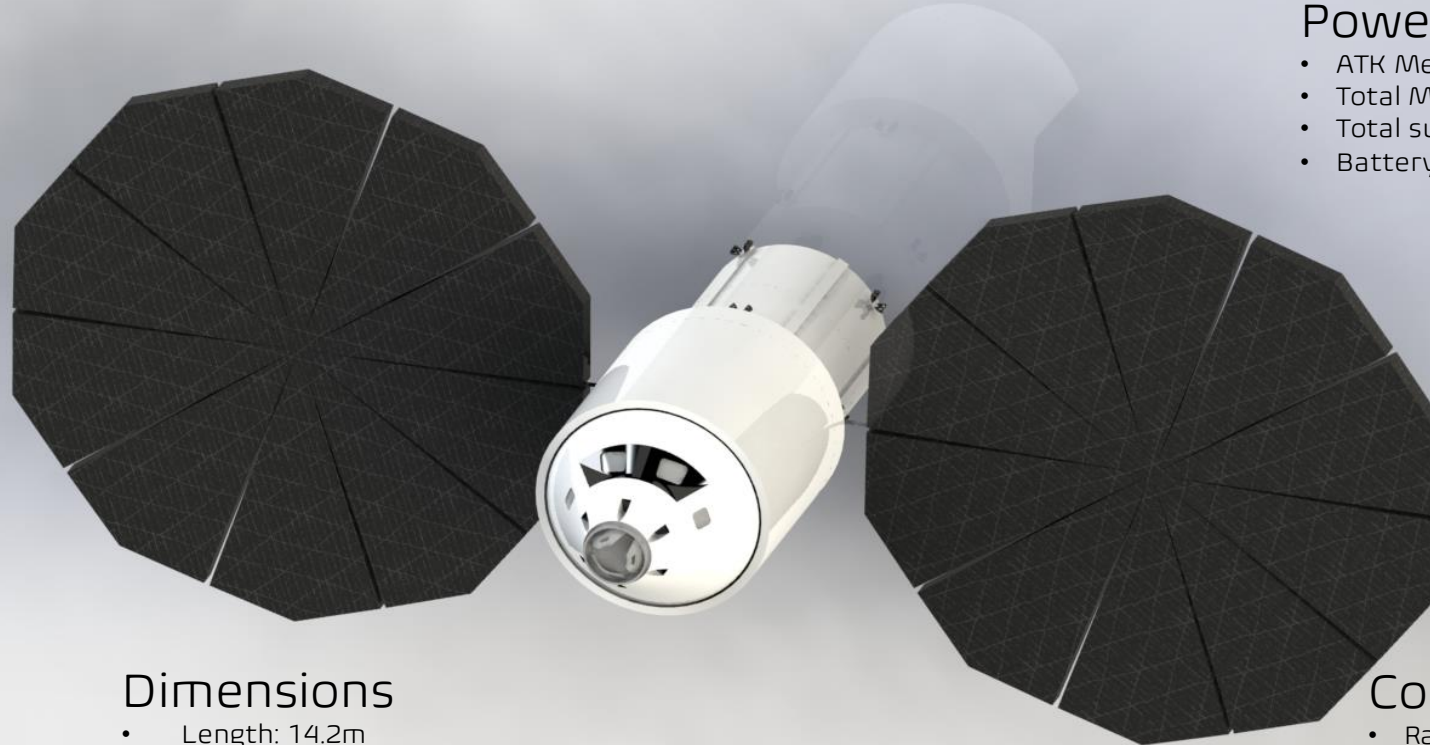
Surface Mobility System

- Propulsion: B20 Thrusters w/ N2O/C3H6
- Power: Li-Ion Batteries, Solar Arrays
- Equipment: interchangeable Clamshell Sampling Heads, SpaceCube Processor

Cost

- \$6.7 billion, FY 2021

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Dimensions

- Length: 14.2m
- Diameter: 4.6m
- Wet Mass: 11,880 kg

Launch Vehicle

- SpaceX Falcon Heavy (Expendable Configuration)
- Launch cost: \$150 Million USD
- Max payload: 37,000 lb. (16.8 t)
- Launch: July 2nd, 2035 at KSC 39A

Scientific Equipment

Objectives

1. Local/Global Characterization of Moons
2. In-Situ Observations of Materials on Moons
3. Solar Winds/Magnetic Fields Analysis

Thermal Management

- Radiator Surface Area: 355.4 m²
- Total Thermal Management Mass: 2462.58 kg
- Equipment Highlights: Radiators, Heaters, Louvers, Pumped Fluid Loops, MLIs, Thermal Coatings

Power Systems

- ATK MegaFlex Solar Arrays w/ triple junction cells
- Total Mass: 1530.4 kg
- Total surface area of Solar Array: 320.85 m²
- Battery pack: 8 Saft VES 16 11s16p Lithium-ion

Communications

- Radio Frequency
- Data rate: 0.5 - 4 Mbps
- Total Mass: 123.7 kg
- Equipment: C&DH System, USOs, SDST, Ka and X-band TWTAs, High and Low gain Antennas

Propulsion

- RL-10C-3X
- LH2/LOX
- Propellant mass: 6600 kg
- Thrust: 24340 lbf