

# Aithos

## Technical Specifications

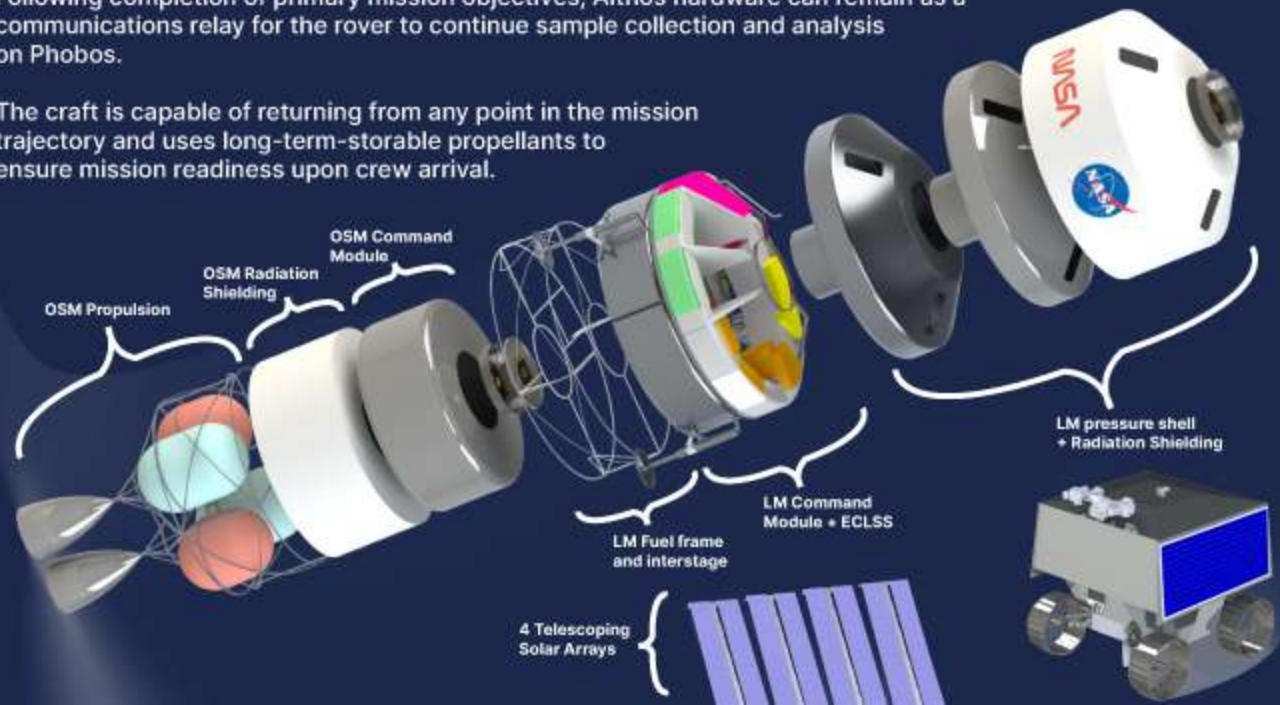
Transfer Vehicle: SpaceX Starship  
Wet Mass: 32,000 kg  
Mission Duration: 18 days  
OSM Thrust: 110 kN  
LM Thrust: 1600 N

## Abstract

Aithos is a dual-vehicle orbiter and lander system for excursion to and exploration of the Mars moons Phobos & Deimos. It is equipped for a 30 day single-sortie mission and collection of 50+ kg of sample from each moon for return to the Earth-Mars Transfer Vehicle.

Following completion of primary mission objectives, Aithos hardware can remain as a communications relay for the rover to continue sample collection and analysis on Phobos.

The craft is capable of returning from any point in the mission trajectory and uses long-term-storable propellants to ensure mission readiness upon crew arrival.



## Objectives

- Demonstrate vehicle reusability after landing without preventative maintenance
- Collect & return 50kg of regolith samples from each moon
- Deploy rover for continued exploration post-mission

## Structures

Light-weight aluminum provides superstructure support over high-density polyethylene pressure vessels, resulting in huge weight savings across the craft.

Radiation protection is provided by a 3-shell composite of MLI, beta-cloth, and external aluminum wall.

## ECLSS

Environmental Control & Life Support systems provide monitoring, scrubbing, and reclamation systems alongside measures to maintain crew psychological wellness and physical fitness.

The vehicle provides 68 cubic meters of free crew space for exercise, food preparation and consumption, mission operations, and sleep.

## Guidance, Navigation & Control

The EEV departs from Earth-Mars crew transit vehicle and transfers to Deimos for initial exploration before direct transfer to Phobos and return to the transit vehicle.

The OSM and LM can return to the transit vehicle from any point in the trajectory if needed.

## Exploration & Collection

Aithos uses an autonomous rover with remote control capabilities to select and remove samples from specified areas to provide high-fidelity data over large areas of interest around the landing site.

Following the mission, the rover can be left on the last moon for continued exploration opportunities.