

# WOLF

*What's On the Lunar Farside?*



ESDM Systems Engineering Paper Comp

3/10/20C

# WOLF

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## Mission Overview

WOLF is a lunar mission to the Aitken (SPA) Basin located on the farside of the moon, seeking to answer some of the remaining questions about our solar system. Through the analysis of SPA samples, scientists can constrain the period of inner solar system late heavy bombardment and gain knowledge of the SPA basin system, its history, and unknowns surrounding the lunar farside.

### Mass Breakdown Structure

Element	Mass (kg)
Dry Mass of Single Lander	634.2
Propellant Mass of Lunar Descent	774.3
Dry Mass of Orbiter	204.1
Propellant Mass of Lunar Orbit Insertion	631.5
Boosted Mass	4327.7
Total Margin	2072.3
Launch Capability of HLV	6400

### V Budget

V Budget		
Atlas V HLV		
Launch	9.5	km/s
Translunar	3.3	km/s
WOLF Spacecraft		
Orbit	0.55	km/s
Descent	2.05	km/s
Return	2.65	km/s

### WOLF Payload

Lander		Orbiter
Drill	Microscopic imager	Magnetometer
Storage Container	Mass spectrometer	
Extendable Arm w/ Scoop	Visible/NIR Spectrometer	Visible/NIR Spectrometer
Panoramic imager	Descent Imager	Gamma Ray Spectrometer

### DSN Specifications

Antenna Diameter	26 m
Uplink Freq	7 GHz
Downlink Freq	8 GHz

### Communications

The orbiter will provide intermittent, one-way communication between the lander and ground operations via the Deep Space Network (DSN). High resolution images and spectrometry will aid in lunar sample selection.

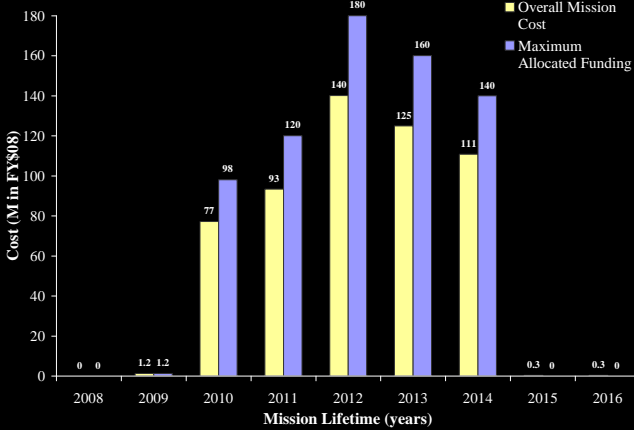


# WOLF

## SALEH Team Structure

Michael Bernatovich Project Manager  
 Nicholas Daily Mission Engineer  
 Jonathan Keim Systems Engineer  
 Laura Place Project Engineer  
 Jennifer Rome Payload Engineer

## Cost Schedule



Cost Breakdown	Mil of FY\$08
(2) Lunar Landers	336
Communication Relay Satellite	78
Atlas V HLV	130
Ground Operations	1.7
NASA Curatorial Facility	1.3
Phase A Concept Study	1.2
<b>Overall Mission Cost</b>	<b>548.1</b>

## WOLF OVI Diagram

