GSFC SKY TEAM: MISSION HERMES

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MARS ROVER OVERVIEW

MISSION GOALS

- Study the habitability of Mars with regards to humans presense, plants, and wildlife
- Explore uncharted territories and collect samples for a potential return mission
- Work with international and commercial partners to expand our potential
- Monitor and characterize environmental variations such as (temperature, pressure, dust opacity) and surface radiation levels at the landing site

WHERE WE ARE HEADED

Destination: Mars. Mars has more scientific implications, as it has a potential for past and present life. Developing a better understanding of Mars itself can lead to a safe decision regarding whether or not human life is sustainable there.

SCHEDULE

NGINE TESTING JUNE 10 - JULY 10 2027

LAUNCH DECEMBER

LANDING **1. DEPLOY RETRO ROCKETS** 2. CAMERA AI FINDS SAFE LANDING AREA **3.RETRO ROCKETS DEPLOY SKYCRANE FOR GENTLE LANDING**

10, 2027

ENTRY/DESCENT JUNE 20, 2027 1.DISCARD ROCKETS

2. KEEP AEROSHELL HEAT SHIELD ANGLED TOWARDS VELOCITY DIRECTION 3. PARACHUTE DEPLOYS. DISCARD AEROSHELI AND HEATSHIELD

> TOTAL DURATION 345 DAYS FROM **TESTING TO** TOUCHDOWN

SUSTAINABILITY COMPONENT

Adapting to Challenges in Space While Maintaining productivity

oNav: adapting to communication lelays and terrain challenges while high productivity through

ty even in failure scenarios, a ation to the unpredictable

These technologies show how NASA is actively solving the operational and environmental limitations of space – such as latency, failure risk, and bandwidth – through smart, autonomous systems

MISSION DESIGN

ADEQUATE POWER:

Mission Hermes invested in a power supply of 50 and ended with an extra power supply of 4!

SCIENCE RETURN:

Mission Hermes exceeded the benchmark science return gain of 51. We gained a total science return of 99!

MISSION MECHANICAL SYSTEMS



COMPUTER SYSTEMS



HEAVY-LIFT ROCKET POWER SUPPLY





COMMUNICATIONS



SUCCESSFUL LAUNCH:

Our rocket successfully launched with a total mass of 239 and a lift of 240. Leaving an extra 1 of mass!

CHALLENGES FACED:

Rocket Failure Resolved by updating budget and scheduled launch. Accurate Resource

Management Inaccurate budget data identified and resolved with peer review.

ENTRY, DESCENT, LANDING (EDL)



SCIENCE INSTRUMENTS







Card Name	Cost	Mass	Power Supply	Power Draw	Retu rn	
Multi-Mission Radioisotope						
Thermoelectric Generator	20	20	50			L
Optical Terminal	10	10		8	10	L
Main Memory Card	3	1		3	3	
Low-Gain Antenna	2	1		3	1	
Rock Drill	- 4	10		5	2	
Rotating Instrument Mount	- 4	5		1	0	
Robotic Arm	- 4	16		1	3	
Heavy Lift Rocket	50					
Rocket Nose Cone	5	5				
Standard Microprocessor	2	1		2	5	
Main Bus	8	5		5	3	
Advanced Microprocessor	5	2		- 4	5	
Heimdall Camera	5	3		1	1	
Medium-Resolution Camera	8	- 4		2	7	
Infrared Spectrometer	8	3		3	- 4	
Radiation Sensor	2	1		1	1	
High-Energy Spectrometer	6	- 4		5	3	
Helicopter	10	3		1	10	
Sample Collection Device	6	5		1	5	
On-Board Battery	5	5	0			
Infrared Camera	5	3		2	3	
Navigation Cameras						
(NAVCAMS)	8	1		2	5	L
Magnetometer	4	1		2	1	

Helicopter Release System103Weather Sensor54.Cachecam62.Wheels108.Retro Rockets1040.Hypersonic Parachute820.Lander1525.Lower-Power Solar Panel1430TOTALS:27423980Hission Category• Power Supply• Power Supply			
Helicopter Release System103Weather Sensor54Cachecam62Wheels1081040Hypersonic Parachute820Lander1525Aeroshell20Lower-Power Solar Panel143030TOTALS:Power SupplyCommunicationsMechanical SystemsRockets			
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TOTALS: 274 239 80 Mission Category Percentage Cost • Power Supply • Communications • Mechanical Systems • Rockets			
Mission Category Percentage Cost Power Supply Communications Mechanical Systems Rockets	74	99	240
Computer Systems Mobility Science Instruments 32.12 365 5.47	7		

NASA AND INTERNATIONAL PARTNERS

BUDGET

Partnering with ESA can provide advanced rover tech and scientific instruments, boosting our mission quality while promoting global collaboration.

Commercial partners like SpaceX offer realize, cost effective launch solutions that let us focus on science and innovation.

OUTREACH PLAN

We shared our mission with the public through instagram by posting our team goals, patch, and work progress. A single post and a reel were used to highlight our mission and inspire others.



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