



National Aeronautics and  
Space Administration

# EXPLORE SCIENCE

**NAC HEOC/SC Joint Meeting**

**Dr. Thomas H. Zurbuchen**

Associate Administrator

NASA Science Mission Directorate

 @Dr\_ThomasZ

January 14, 2021



# KEY SCIENCE THEMES

**PROTECT AND  
IMPROVE LIFE ON  
EARTH AND IN SPACE**

**DISCOVER SECRETS  
OF THE UNIVERSE**

**SEARCH FOR LIFE  
ELSEWHERE**





# NASA Science Strategic Approach

## VISION

Lead a globally interconnected program of scientific discovery that encourages innovation, positively impacts people's lives, and is a source of inspiration

## MISSION

Discover the secrets of the universe

Search for life elsewhere

Protect and improve life on Earth and in Space

## VALUES

Excellence

Inclusion

Leadership

Integrity

Teamwork

Safety

## PRIORITIES

Exploration and Scientific Discovery

Innovation

Interconnectivity and Partnerships

Inspiration

A composite image featuring a person standing on a rocky peak, an eagle in flight, a crescent moon, and a comet against a starry sky.

# Exploration Updates from SMD

- Biological and Physical Sciences Division moved from HEOMD to SMD in 2020
- Exploration Science Strategy and Integration Office (ESSIO) started in 2018, grew in 2020 with the addition of two permanent Program Scientists and Program Executives
- Artemis III Science Definition Team began meeting in September 2020 to define science objectives for all aspects of the Artemis III mission; SDT report published Dec. 7, 2020
- Released first call for Payloads and Research Investigations on the Surface of the Moon (PRISM); step 1 proposals received in December, and step 2 proposals due Feb 3



# Welcome, Dr. Joel Kearns

- Effective February 1, 2021, Dr. Joel Kearns will serve as Deputy Associate Administrator for Exploration (DAAX)
- Dr. Kearns has more 32 years of experience in leadership roles at multiple NASA centers and in private industry
- Currently the director of Facilities, Test and Manufacturing at NASA's Glenn Research Center
- I would like to give my appreciation and thanks to Dr. Dave Burns, who has done an excellent job in keeping the Exploration Science Strategy and Integration Office (ESSIO) portfolio moving forward



# VALUABLE LUNAR SCIENCE



Study of Planetary  
Processes



Understanding  
Volatile Cycles



Impact History of  
Earth-Moon System



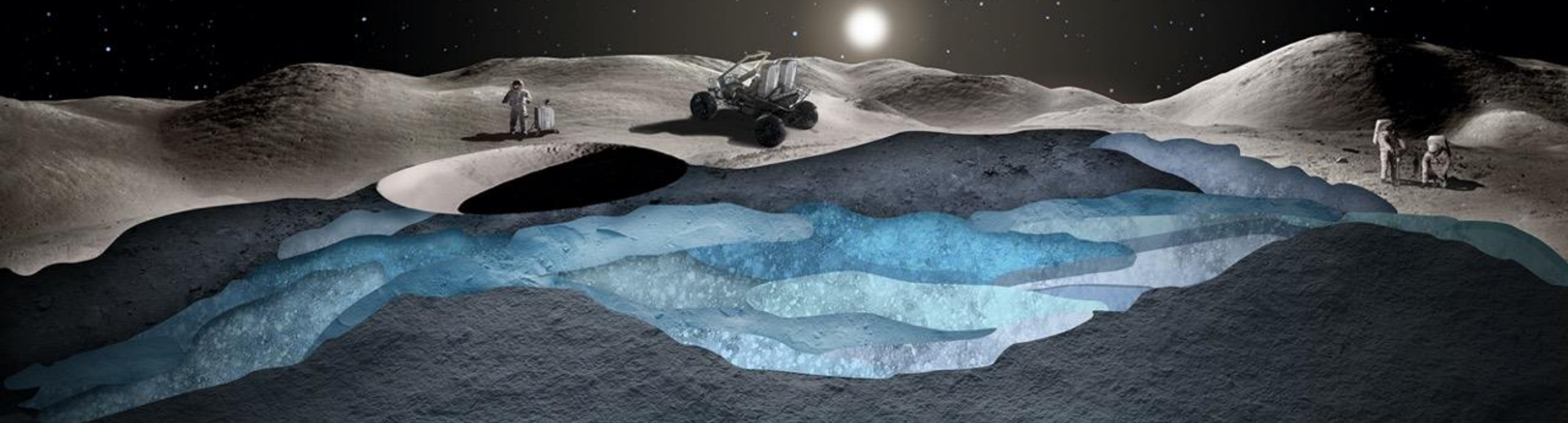
Record of the  
Ancient Sun



Fundamental  
Lunar Science



Platform to Study  
the Universe



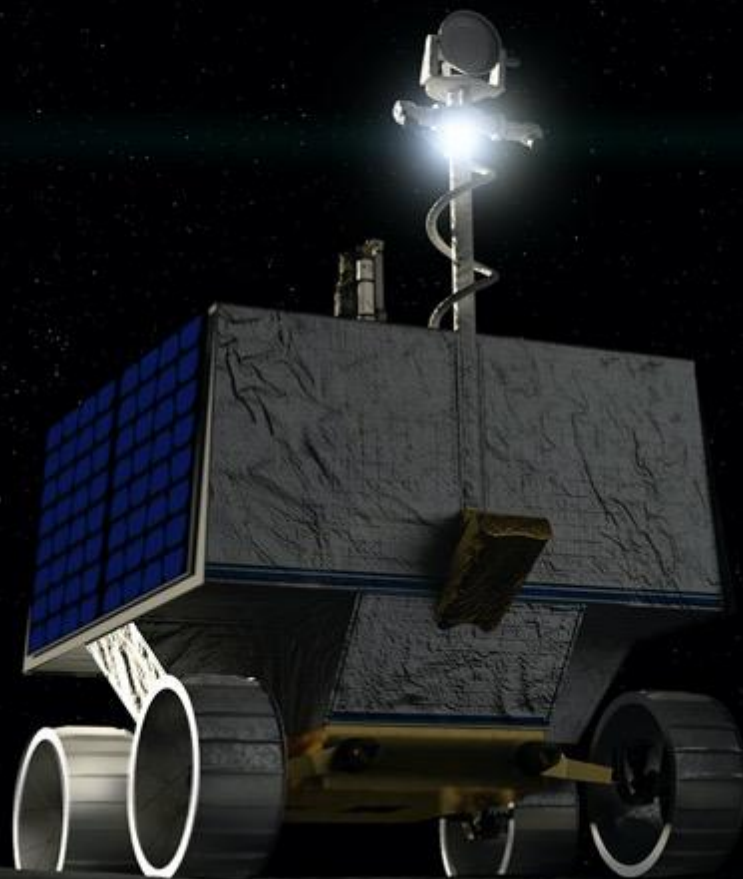


# PEREGRINE MISSION ONE



# NOVA-C





# VIPER

Volatiles Investigating  
Polar Exploration Rover  
will go to Lunar South Pole  
to get a close-up view of  
location and concentration  
of water ice

**NASA Johnson Space Center**  
**NASA Ames Research Center**



# Lunar Trailblazer

Small satellite mission to understand the lunar water cycle – detecting and mapping water on the Moon's surface



**Caltech**

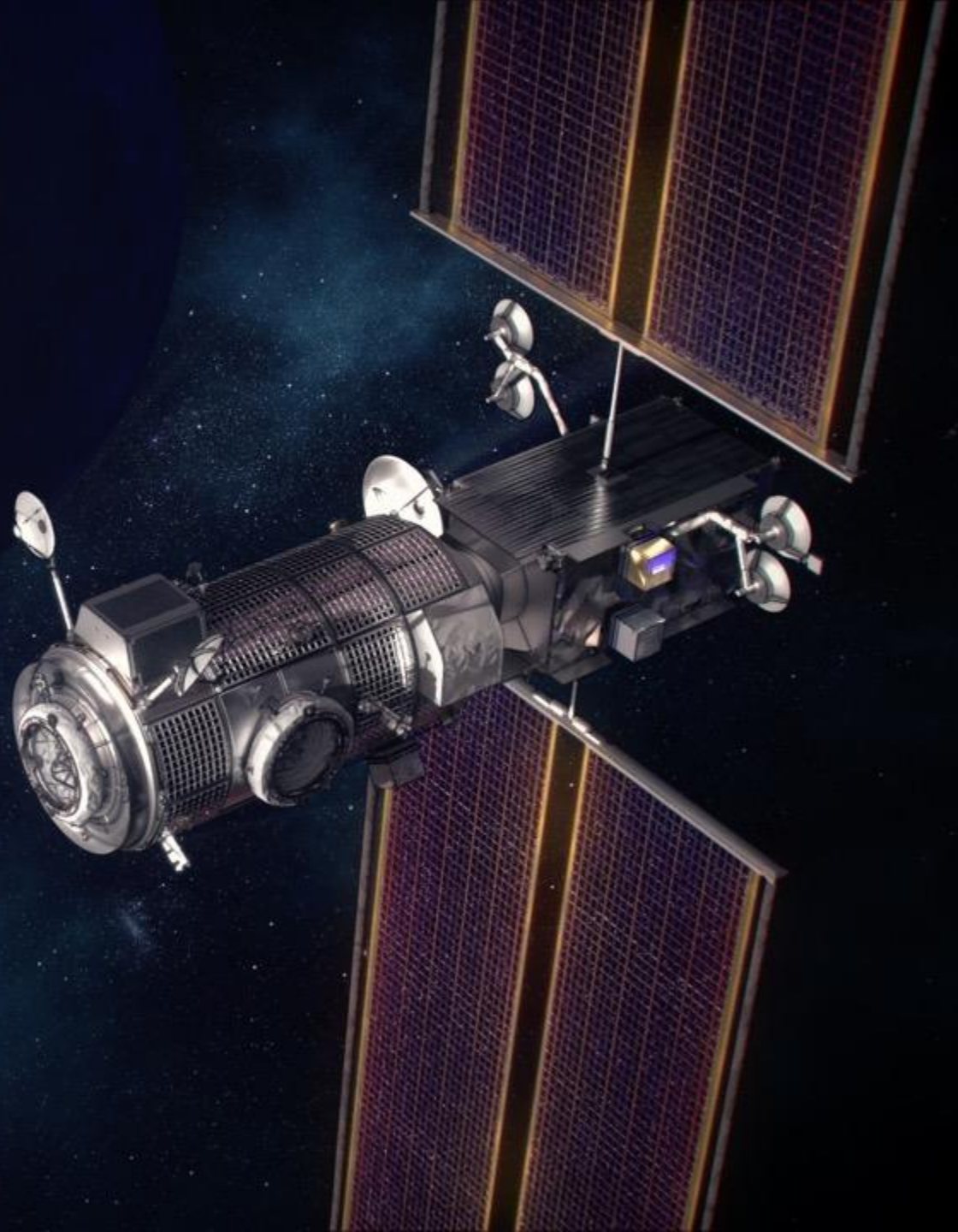
**LOCKHEED MARTIN**





# HERMES & ERSA

Space weather instrument suites, NASA's HERMES and ESA's ERSA will monitor the lunar radiation environment on Gateway





# BIOEXPT-1

Space Biology Research  
on Artemis I, pathfinder for  
biological research beyond  
Low-Earth Orbit





# MARS 2020 PERSEVERANCE

Will land on February 18,  
equipped with technology to  
teach us more about the  
environment and demonstrate  
what's needed to support  
future crewed missions





# Agenda for Meeting

- Today's meeting will focus on cross-cutting Moon to Mars efforts including:
  - Commercial Lunar Payload Services (CLPS)
  - PSD update on VIPER, ANGSA, SSERVI, etc.
  - HERMES Heliophysics science instrument for Gateway
  - Artemis III Science Definition Team Report
  - BIOEXP-1 and BPS planning for Gateway, CLPS, and human landings
  - MEP/MSR contributions to human spaceflight



# EXPLORE

With Us

