



EARTH SCIENCE



HELIOPHYSICS



PLANETARY SCIENCE



ASTROPHYSICS

# SCIENCE MISSION DIRECTORATE

**SMD in Brief -- Status and Program Highlights  
Presentation to Space Studies Board  
November 8, 2013**





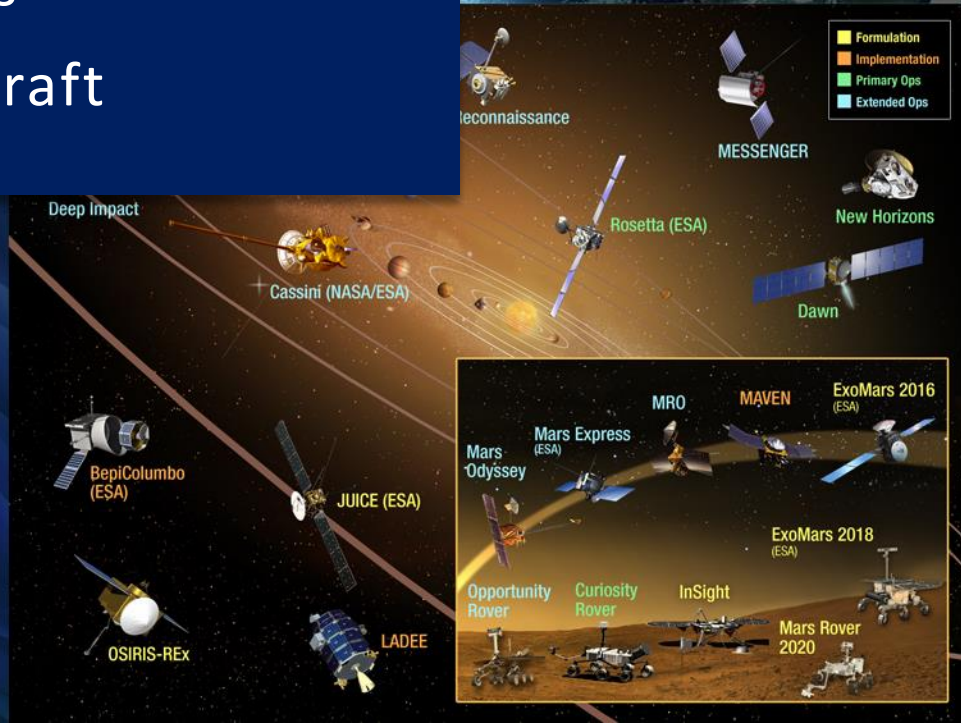
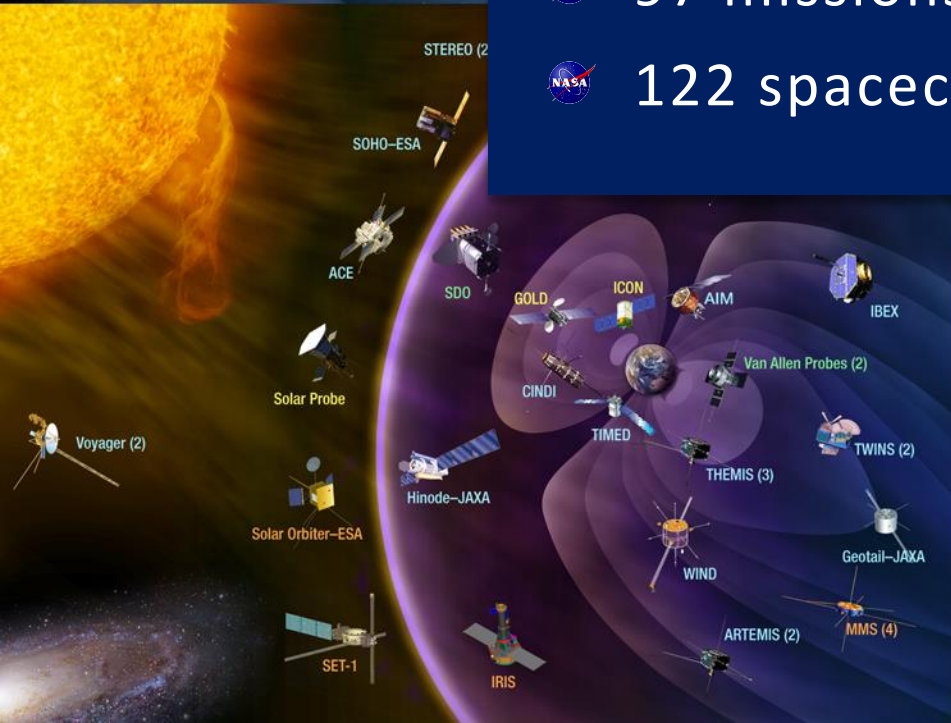
# Science Mission Highlights



97 missions



122 spacecraft





# Lunar Atmosphere and Dust Environment Explorer

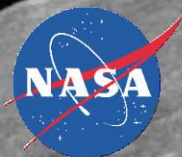
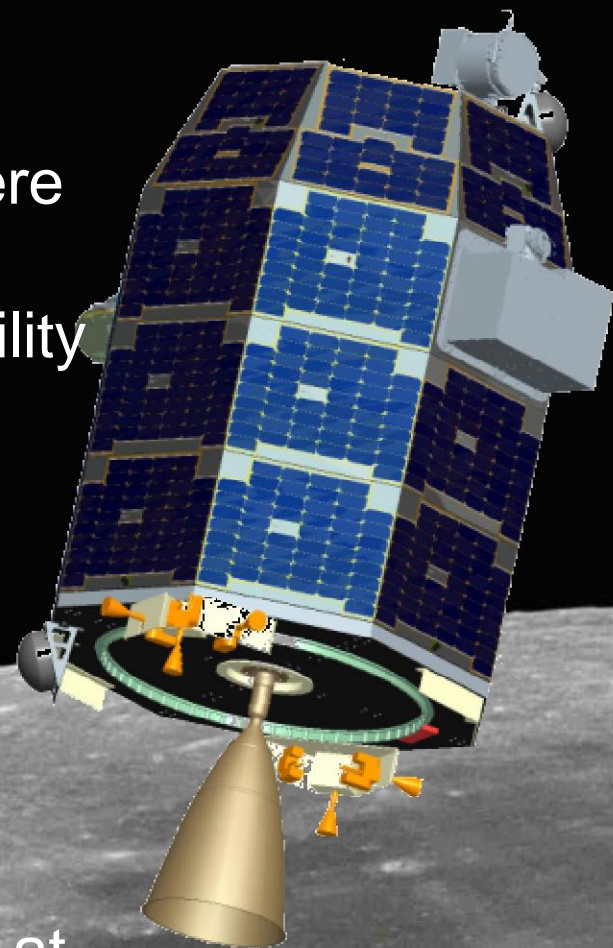
## Objective:

- Measure the lofted Lunar dust
- Composition of the thin Lunar atmosphere

Launch: Sept. 6, 2013 Wallops Flight Facility

## Status:

- Despite shutdown, successfully entered lunar orbit on Oct. 6<sup>th</sup>
- Instrument commissioning ongoing
- Oct. 18<sup>th</sup>, Lunar Laser Communication Demonstration (LLCD) made history, transmitting data from lunar orbit to Earth at a rate of 622 Mbps





# *Mars Atmosphere and Volatile Evolution (MAVEN) Mission*

## Status:

- Launch: Nov. 18, 2013

Mars orbit insertion in Sept. 2014

- Processing continued through shutdown

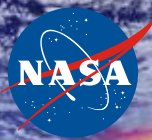
- Currently on schedule and within budget



## Science:

- Determine the structure and composition of the Martian upper atmosphere today
- Determine rates of loss of gas to space today
- Measure properties and processes that will allow us to determine the integrated loss to space through time



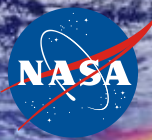


# Global Precipitation Measurement (GPM)

- An international satellite mission jointly led by NASA and JAXA to unify and advance global precipitation measurements from research and operational satellites
  - Next generation global precipitation products with improved accuracy and consistency within a unified Framework
- Radiometer intercalibration, algorithm
- development, and ground validation
- Status:
  - GPM was granted an exception and some work was restarted before the shutdown ended
  - New LDR currently under review with JAXA and NASA







# Magnetospheric Multiscale (MMS)



**Mission Objective:** Investigate magnetic reconnection in the boundary regions of the Earth's magnetosphere. Determine 3-dimensional geometry of the plasma, magnetic fields, and current structures.

**Mission Description:** Constellation of 4 identical spin stabilized satellites flying in tetrahedron formation with 10s to 100s km separation. Elliptical Earth orbits with in situ instruments to measure electric and magnetic fields, ions, and electrons. Extensive orbit maintenance and orbit adjust capability. 2-year operational mission.

**Launch:** Four satellites launched together in one Atlas from KSC



Observatory #1

Early Sept 2013

# SMD Status - Preliminary Furlough Impacts

- Currently working to identify and assess impacts to all SMD missions as a result of the shutdown
- Overall, operating missions not impacted
- Missions in development and review cycles were impacted to various degrees
- Example preliminary impacts include:
  - Magnetospheric Multiscale Mission (MMS) estimated launch delay of approximately one month, which is still within the launch window.
  - NASA and NSF have had to cancel the 2013-14 Antarctic-launched long-duration research balloon missions for the year because they cannot reopen facilities in time to get those balloons off on schedule. With the late start, it is impossible to get the flights done and then safely recover the payloads and close down before the weather changes. Impact is loss of three NASA balloon flights (two science payloads, 1 engineering payload)
  - SOFIA: 9 science flights using US mid-infrared camera (FORCAST) cancelled, permanent loss of science.
  - JWST ISIM cryo-vacuum (CV) test #1 completed, although some testing postponed to CV2 or CV3 due to government shutdown
- Prioritizing both science and technical activities to get back on track

# SMD Status - Preliminary Furlough Impacts

- Research and Analysis – proposal reviews were delayed, which will delay announcements
- 7 solicitations and 2 RFIs delayed due to the shutdown
- Examples include:
  - Research Opportunities in Space and Earth Science (ROSES) due dates initially set to TBD; new due dates have now been posted for all programs
  - Proposal due date for Earth Venture Instrument-2 moved to November 25, 2013
  - Application deadline for the NASA Postdoctoral Program delayed to November 15, 2013
  - Mars2020 proposals due date moved to January 15, 2014
- Specific details can be found at the following website:  
<http://science1.nasa.gov/researchers/sara/grant-solicitations/>