



Jet Propulsion Laboratory  
California Institute of Technology

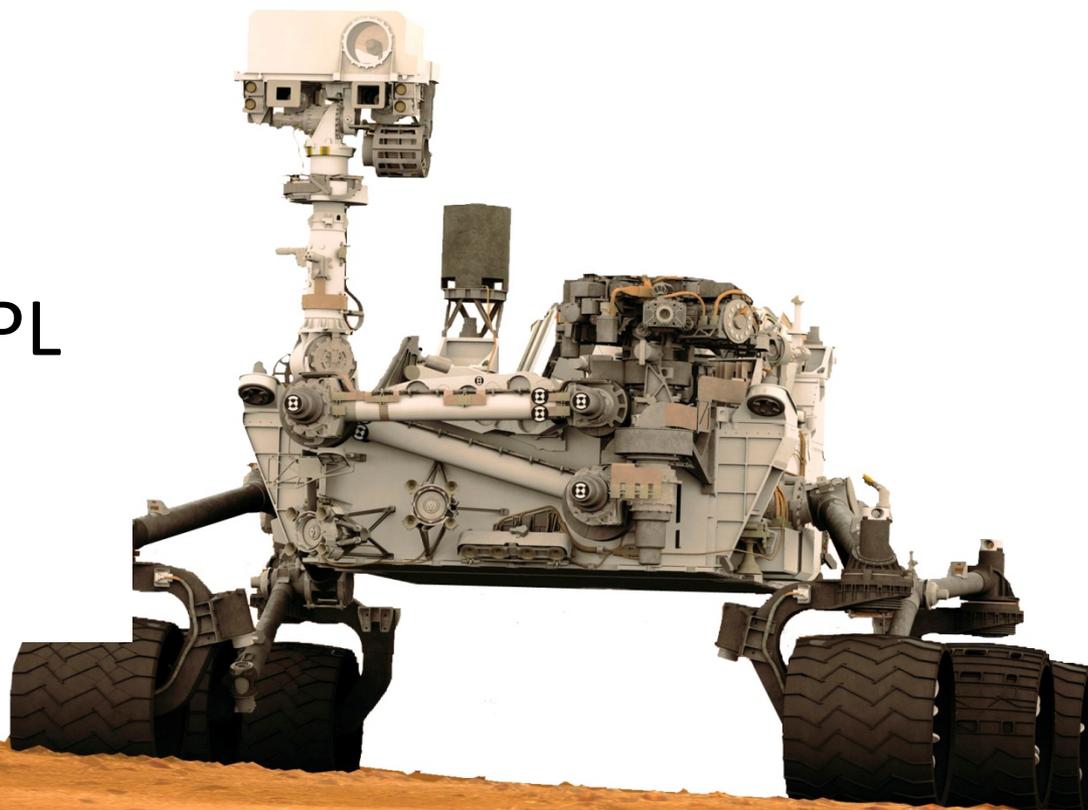
# Brief Overview of JPL

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**James Graf**

November 2012

Deputy Director for Earth Science  
NASA Jet Propulsion Laboratory  
California Institute of Technology



# From Caltech students testing rockets to exploring the planets in our lifetime



Jet Propulsion Laboratory  
California Institute of Technology



**Caltech students (1936)**



**Missiles (1940s)**



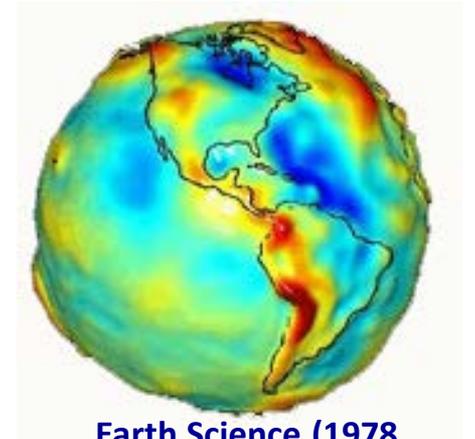
**Explorer 1 (1958)**



**Mars Exploration Rovers (2004  
– present)**



**Spitzer Space Telescope (2004 –  
present)**



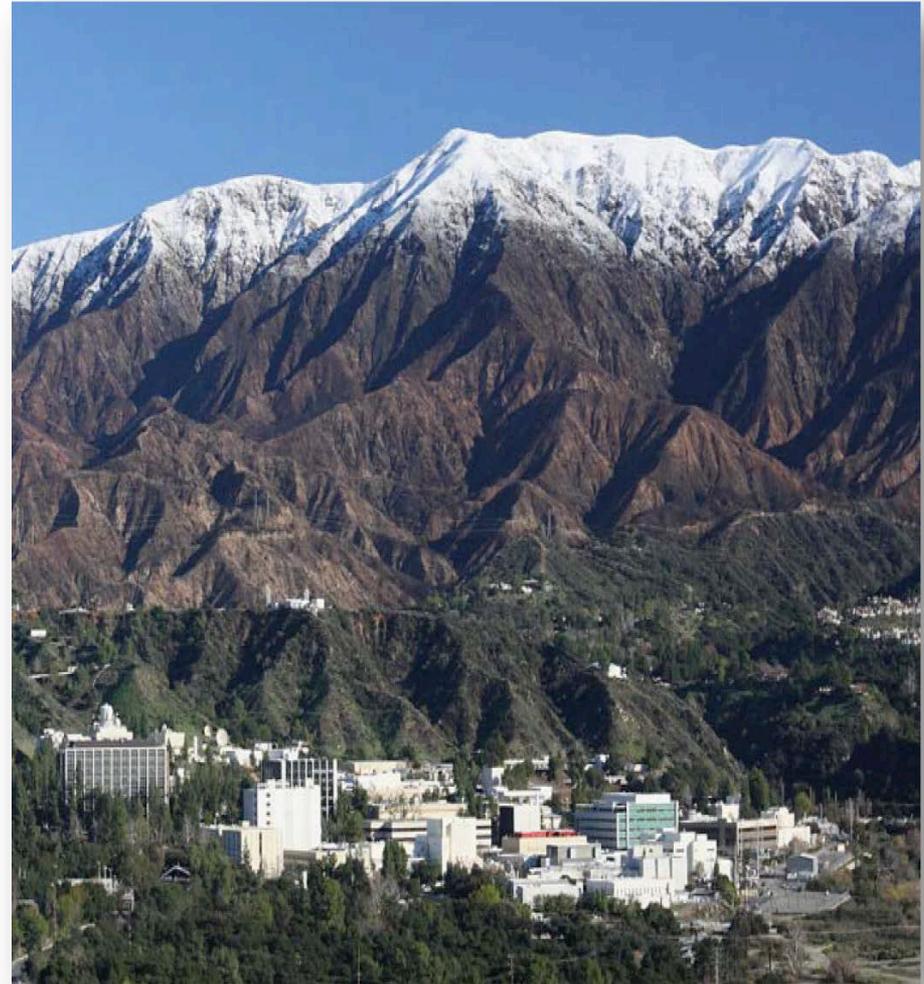
**Earth Science (1978  
– present)**

# JPL is part of NASA and Caltech



Jet Propulsion Laboratory  
California Institute of Technology

- **Federally-funded (NASA-owned) Research and Development Center (FFRDC)**
- **University Operated (Caltech)**
- **5,000 Employees**
- **177 Acres**

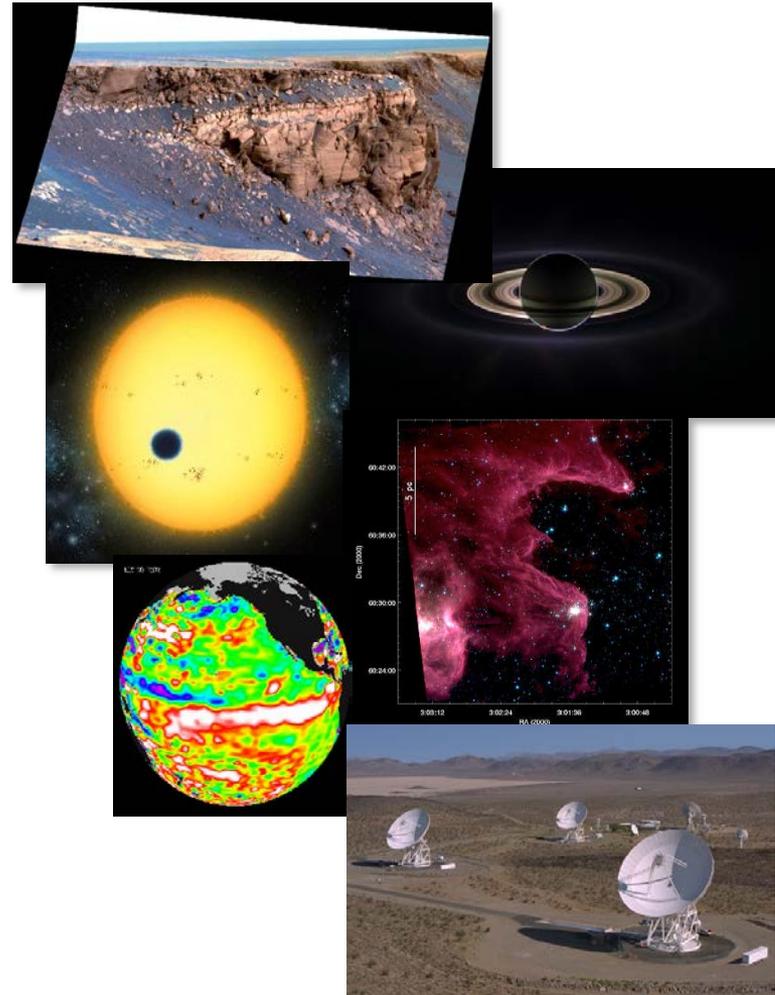


# JPL's mission for NASA is *robotic* space exploration



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- Mars
- Solar system
- Exoplanets
- Astrophysics
- Earth Science
- Interplanetary network

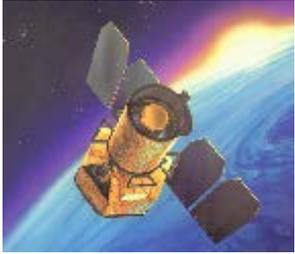


# 24 Spacecraft and 10 Instruments

## Across the Solar System and Beyond



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GALEX



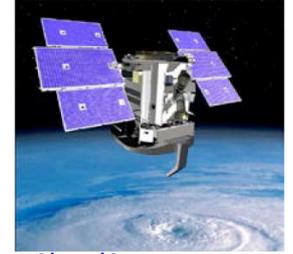
ACRIMSAT



Mars Odyssey



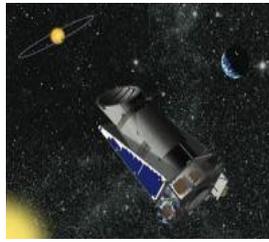
Cassini



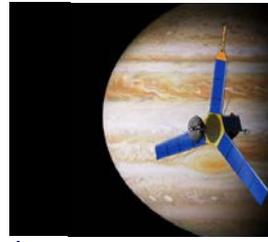
CloudSat



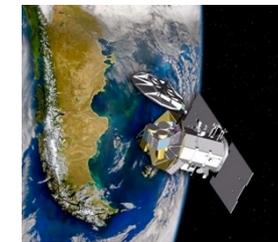
Spitzer



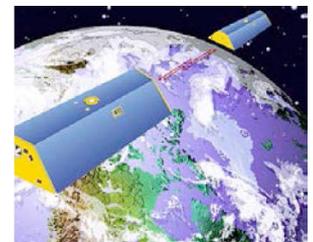
Kepler



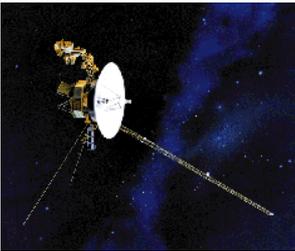
Juno



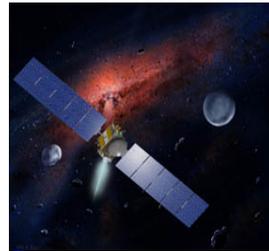
Aquarius CONAE



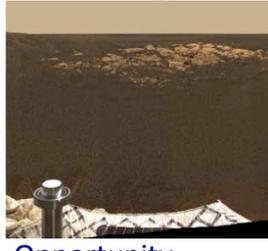
GRACE DLR, GFZ



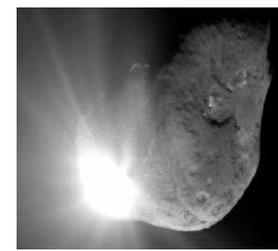
Two Voyagers



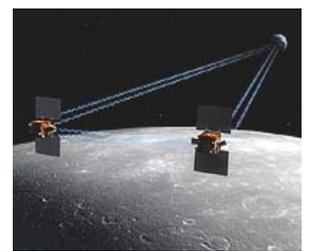
Dawn



Opportunity



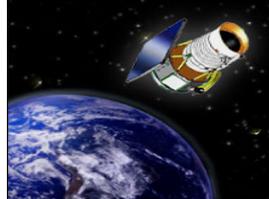
EPOXI-Deep Impact



GRAIL



Mars Science Laboratory



Wide-field Infrared Survey Explorer (WISE)



Mars Reconnaissance Orbiter

**Instruments:**

*Earth Science*

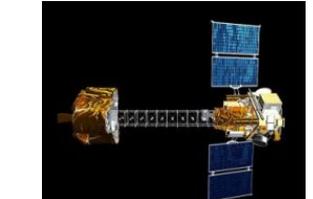
- ASTER



Jason 1 and Jason 2 CNES

*Planetary*

- MIRO
- Diviner



Nuclear Spectroscopic Telescope Array (NuSTAR)



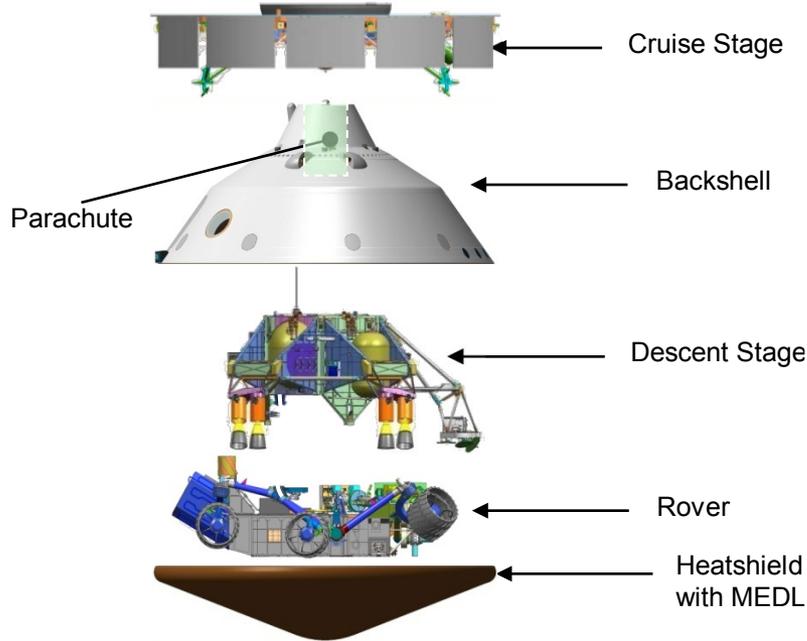
National Aeronautics and Space Administration

Jet Propulsion Laboratory  
California Institute of Technology  
Pasadena, California

# Mars Science Laboratory Overview



## Launch and Cruise Configuration

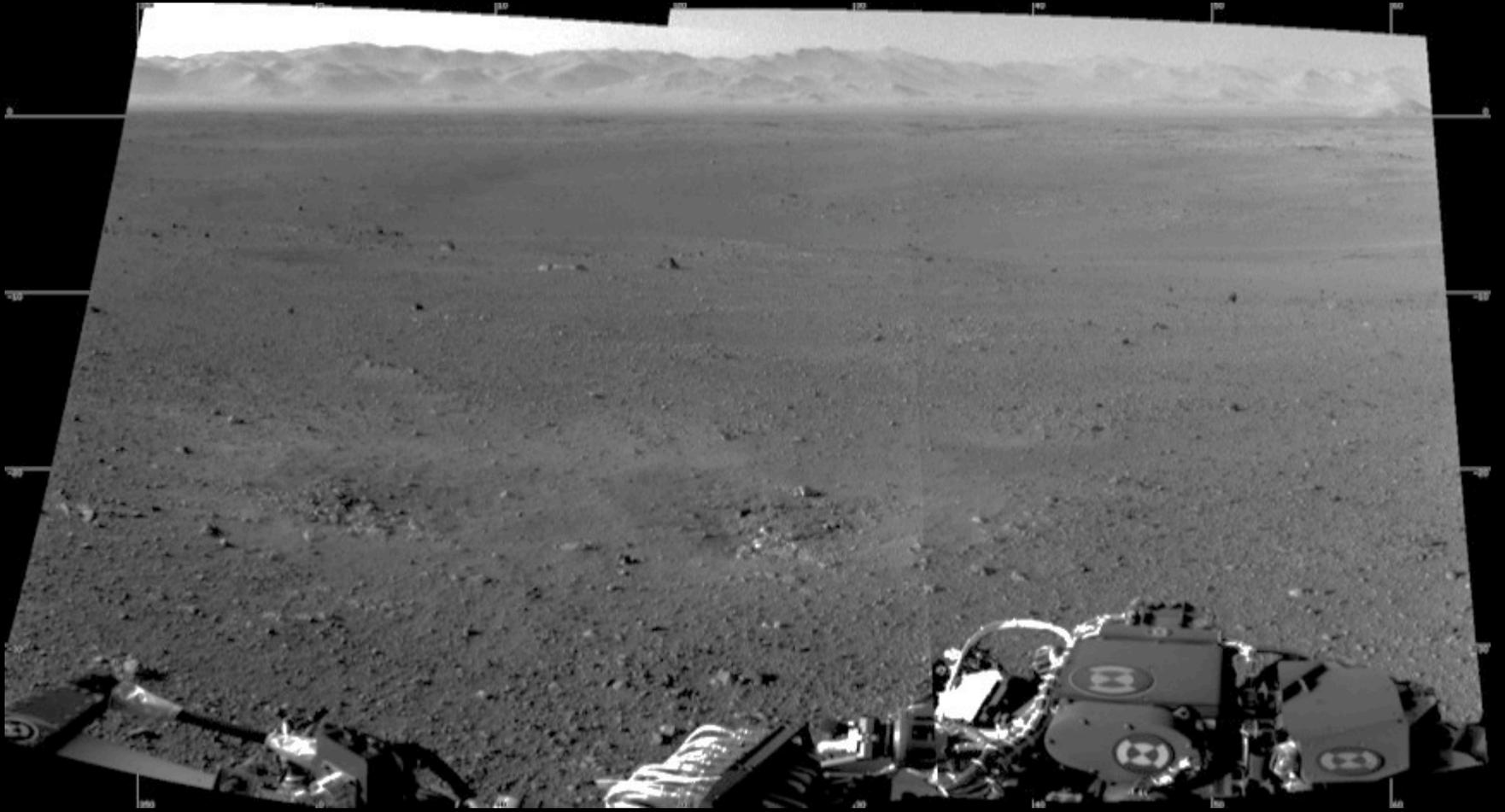


MSL is 3 sub-spacecraft in one

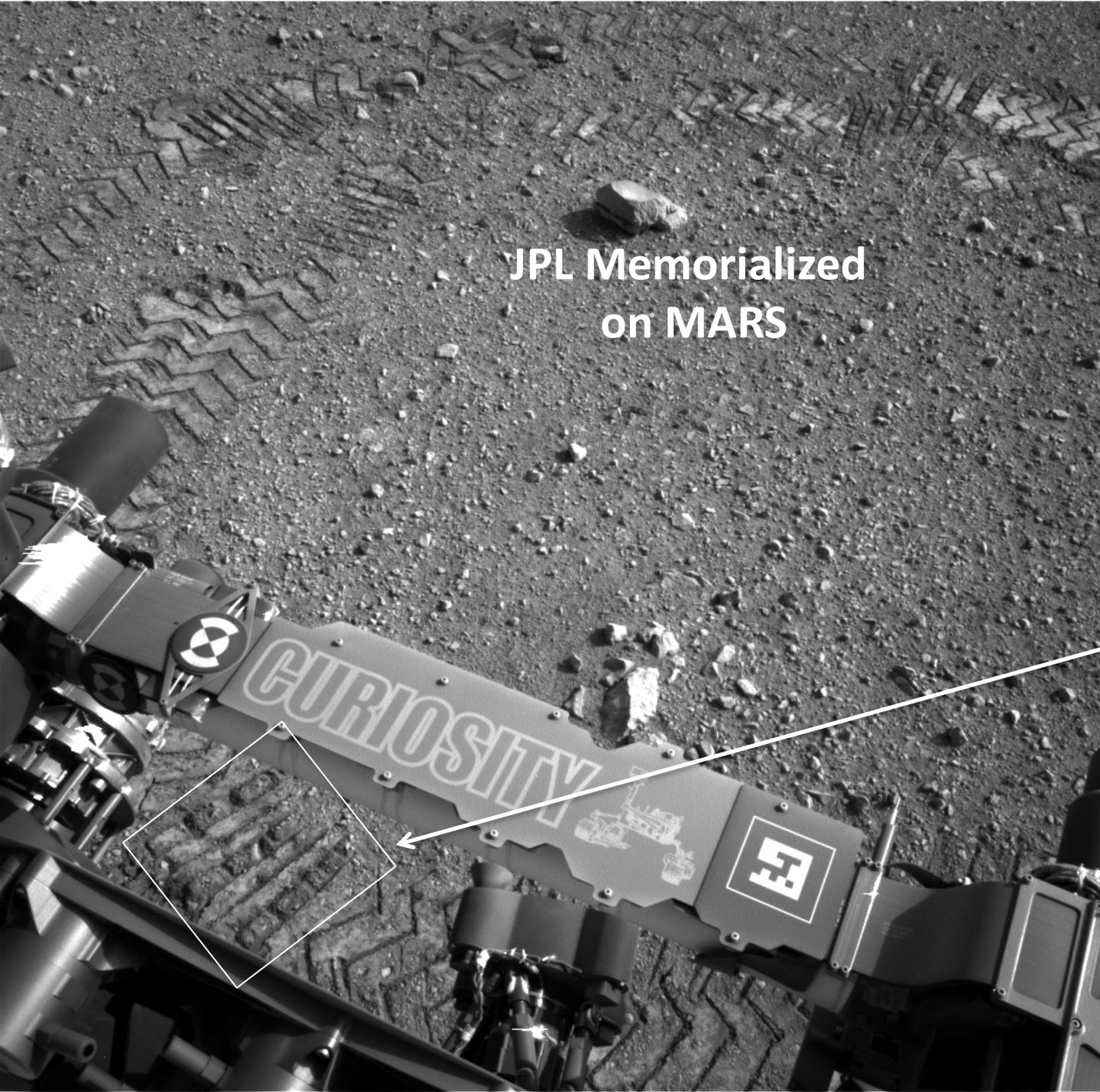


Rover Family Portrait

	<u>Pathfinder</u>	<u>MER</u>	<u>MSL</u>
Entry mass (kg)	580	830	3400
Landed mass (kg)	290	540	930
Rover mass (kg)	10	175	930
Instrument Mass (kg)	1	5	80



Curiosity's New Home



JPL Memorialized  
on MARS



J .---  
P .--.  
L .-..

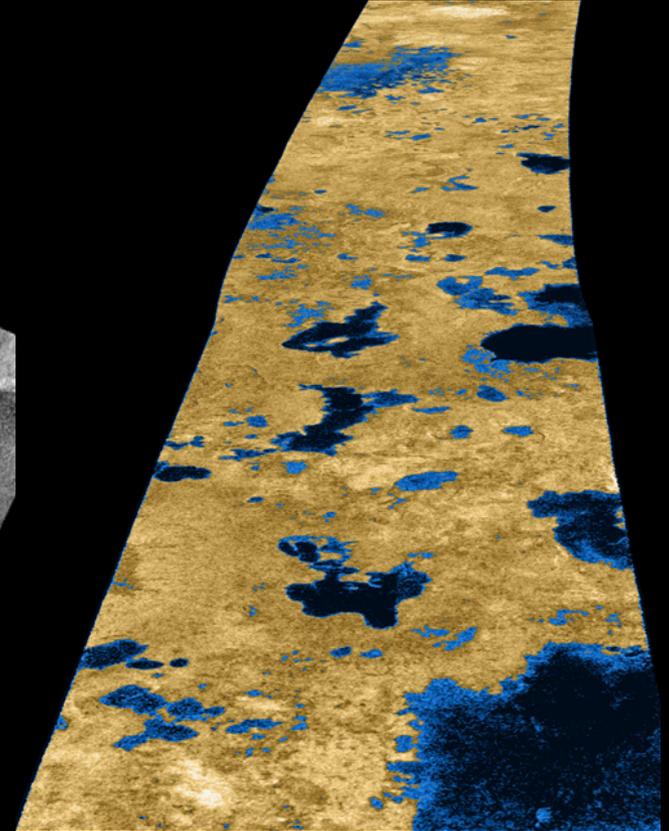
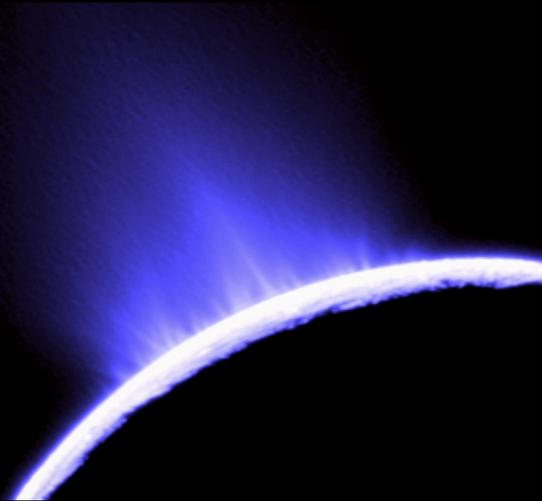
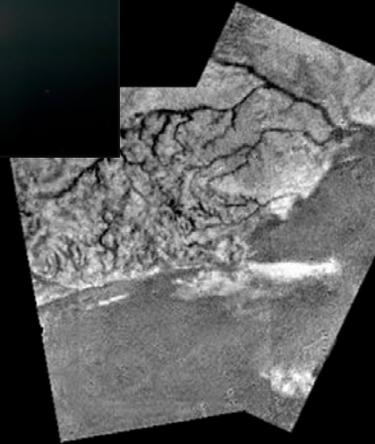
*Morse Code*



National Aeronautics and  
Space Administration

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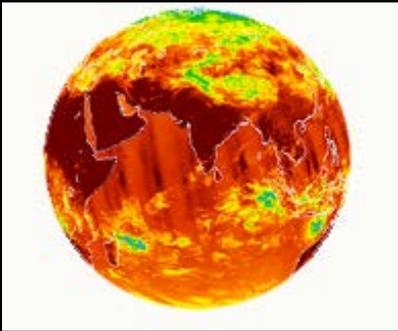
# Cassini/Huygens studies Saturn, Enceladus' geysers, and Titan's lakes



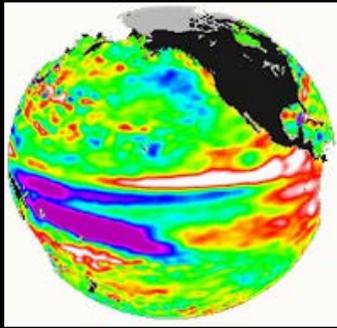


OpNav16a-x 2011-194T03:10 28,000 km

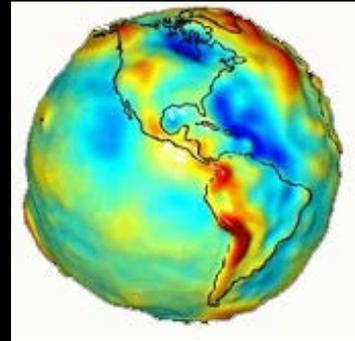
**Dawn Image of Vesta – Taken July 12, 2011**



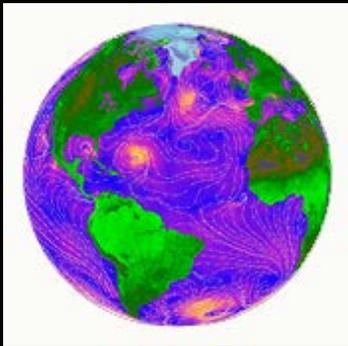
AIRS – atmospheric temperature



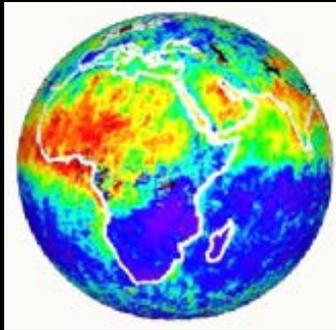
JASON – sea surface height



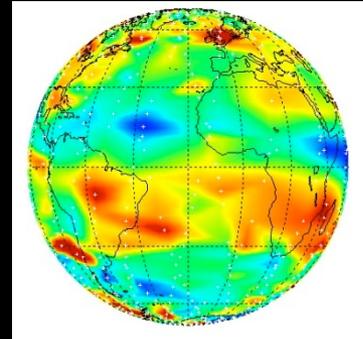
GRACE – gravity



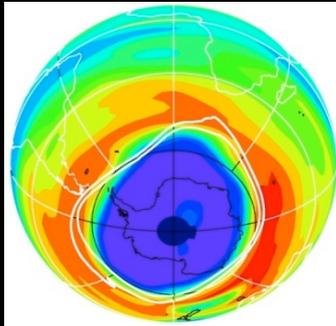
QUIKSCAT – wind



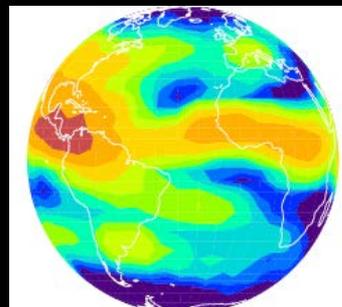
MISR - aerosols



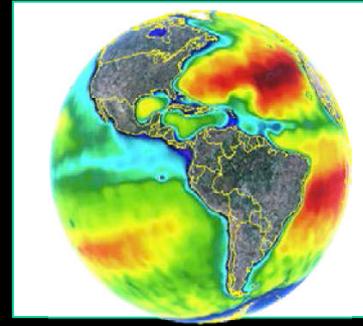
TES – trace gas



MLS – ozone layer



CLOUDSAT – water content



Aquarius - sea surface salinity

Multiple ways to look at a changing Earth