The Journey To Mars

Mars Science Laboratory Mission

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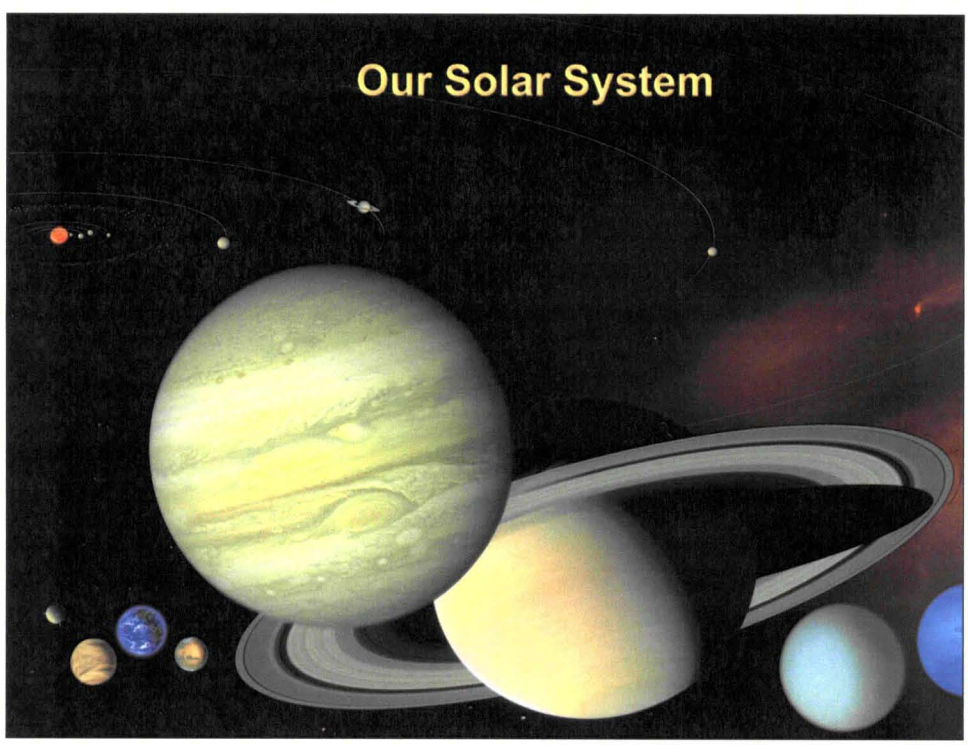
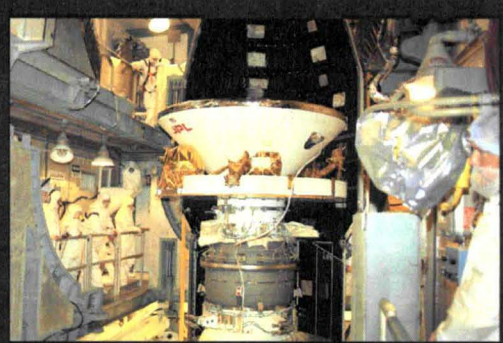
Launch Services Program
NASA, John F. Kennedy Space Center
February 4, 2012

Our Solar System



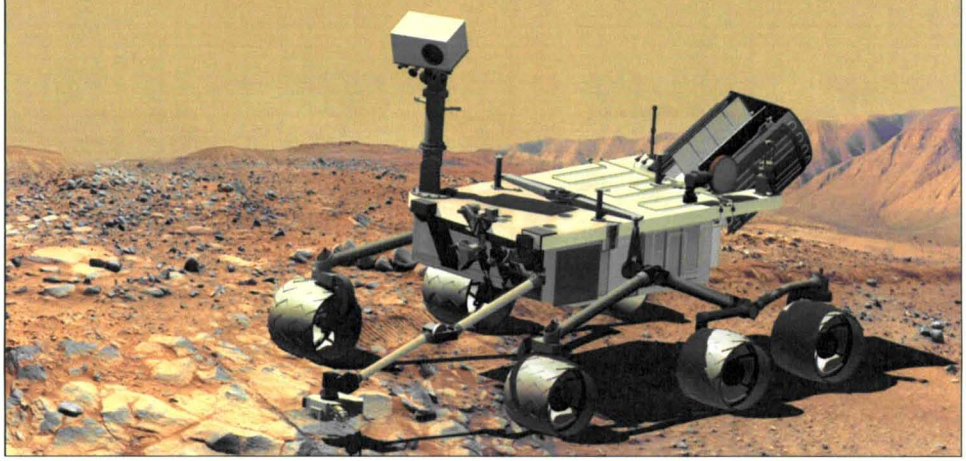
NASA's Legacy of Missions to Mars

Launch of Spirit & Opportunity on Delta II

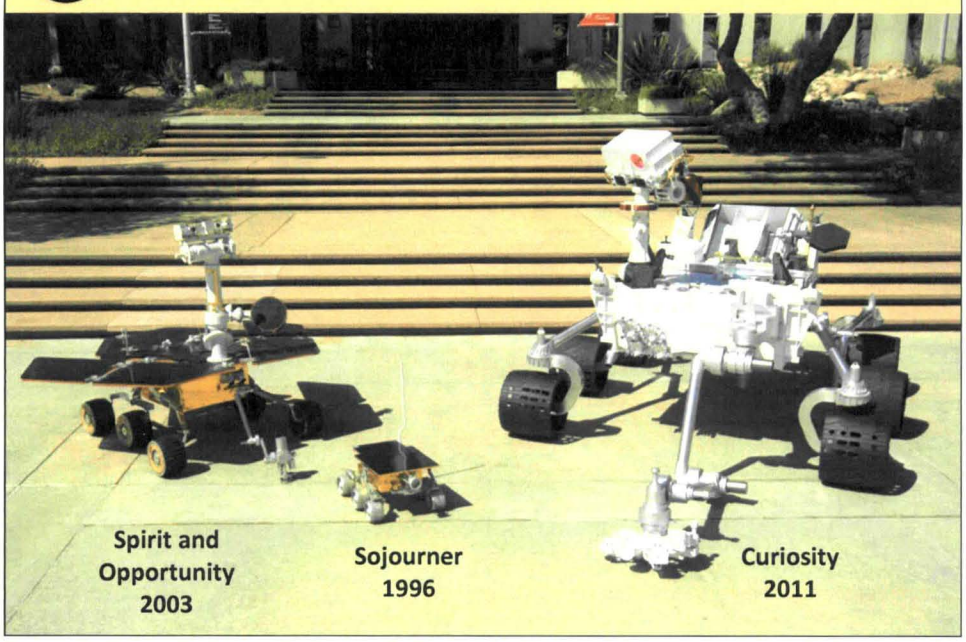


MER-A – Spirit - Launched June 10, 2003
MER-B – Opportunity - Launched July 7, 2003

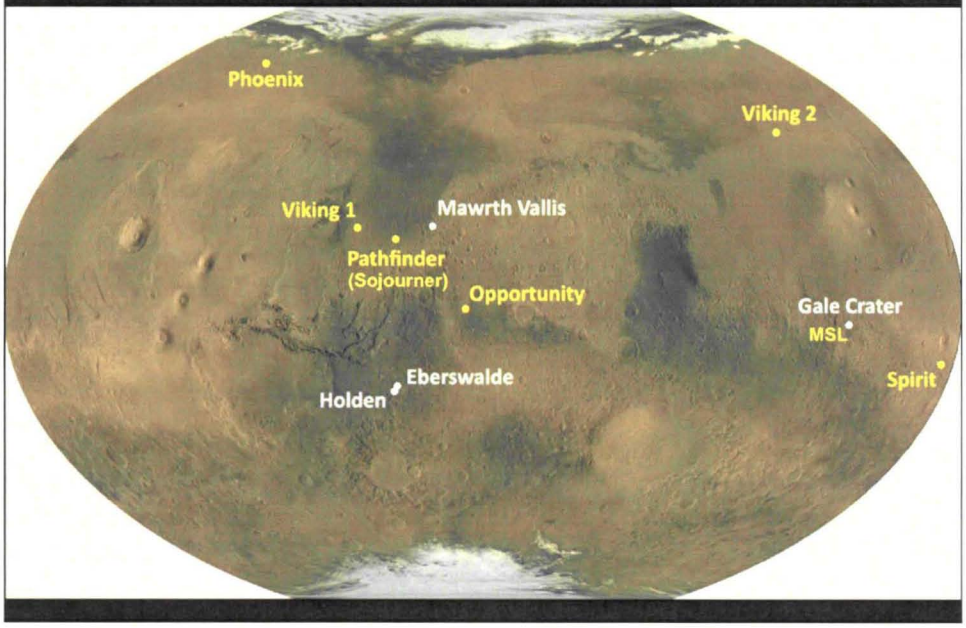
The Mars Science Laboratory "Curiosity" Rover



Rover Family Portrait



Choosing the Ideal Landing Sites on Mars



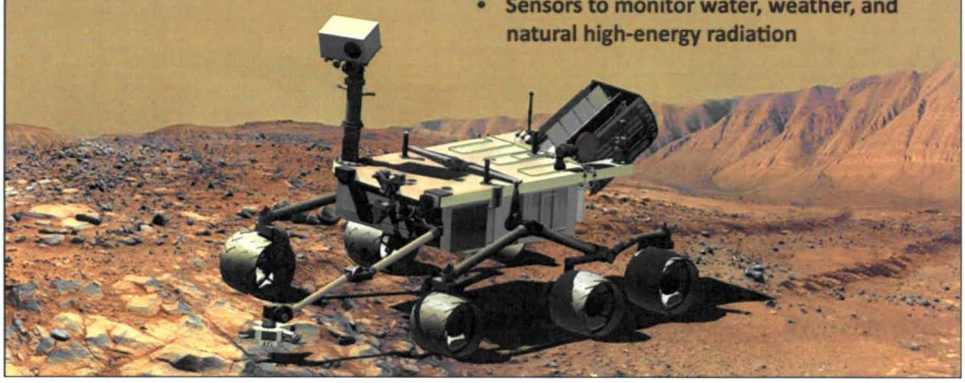
Curiosity's Capabilities

A Robotic Field Geologist

- Long life, ability to traverse many miles over rocky terrain
- Landscape and hand-lens imaging
- Ability to survey composition of bedrock and regolith

A Mobile Geochemical and Environmental Laboratory

- Ability to acquire and process dozens of rock and soil samples
- Instruments that analyze samples for chemistry, mineralogy, and organics
- Sensors to monitor water, weather, and natural high-energy radiation



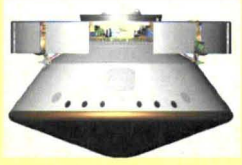
Curiosity's Science Goals

Curiosity's primary scientific goal is to explore and quantitatively assess a local region on Mars' surface as a potential habitat for life, past or present

Objectives include:

- Assessing the biological potential of the site by investigating any organic and inorganic compounds and the processes that might preserve them
- Characterizing geology and geochemistry, including chemical, mineralogical, and isotopic composition, and geological processes
- Investigating the role of water, atmospheric evolution, and modern weather/climate
- Characterizing the spectrum of surface radiation

Mission Overview



CRUISE/APPROACH

- 8-1/2 - month cruise
- Arrive August 6, 2012 (UTC)

LAUNCHED

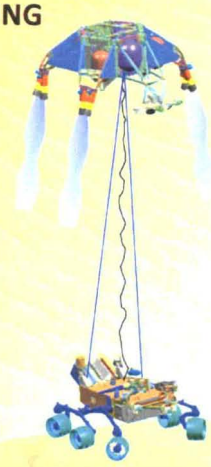
- Nov. 26, 2011 @ 15:02 UTC
- Atlas V (541)

ENTRY, DESCENT, LANDING

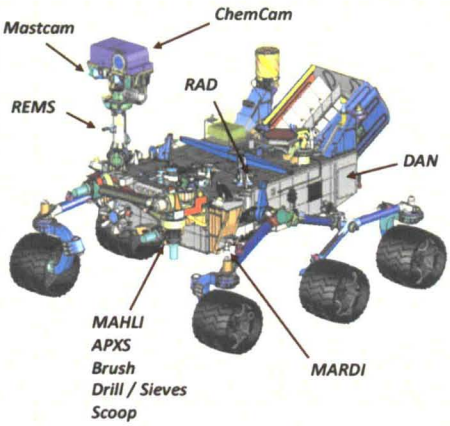
- Guided entry and powered "sky crane" descent
- 20×25-km landing ellipse
- Access to landing sites ±30° latitude, <0 km elevation
- 900-kg rover

SURFACE MISSION

- Prime mission is one Mars year (687 days)
- Latitude-independent and long-lived power source
- Ability to drive out of landing ellipse
- 84 kg of science payload
- Direct (uplink) and relayed (downlink) communication
- Fast CPU and large data storage



MSL Science Payload



Rover Width:	**2.8 m**
Height of Deck:	**1.1 m**
Ground Clearance:	**0.66 m**
Height of Mast:	**2.2 m**

REMOTE SENSING

Mastcam (M. Malin, MSSS) - Color and telephoto imaging, video, atmospheric opacity

ChemCam (R. Wiens, LANL/CNES) – Chemical composition; remote micro-imaging

CONTACT INSTRUMENTS (ARM)

MAHLI (K. Edgett, MSSS) – Hand-lens color imaging

APXS (R. Gellert, U. Guelph, Canada) - Chemical composition

ANALYTICAL LABORATORY (ROVER BODY)

SAM (P. Mahaffy, GSFC/CNES) - Chemical and isotopic composition, including organics

CheMin (D. Blake, ARC) - Mineralogy

ENVIRONMENTAL CHARACTERIZATION

MARDI (M. Malin, MSSS) - Descent imaging

REMS (J. Gómez-Elvira, CAB, Spain) - Meteorology / UV

RAD (D. Hassler, SwRI) - High-energy radiation

DAN (I. Mitrofanov, IKI, Russia) - Subsurface hydrogen

Version: 1/11/2011

Contact: Ashwin Vasavada, JPL
ashwin@jpl.nasa.gov

Cleared for public release by JPL Office of Communications and Education

The launch vehicle used for the Mars Science Laboratory Mission was the Atlas V 541, designated as AV-028.

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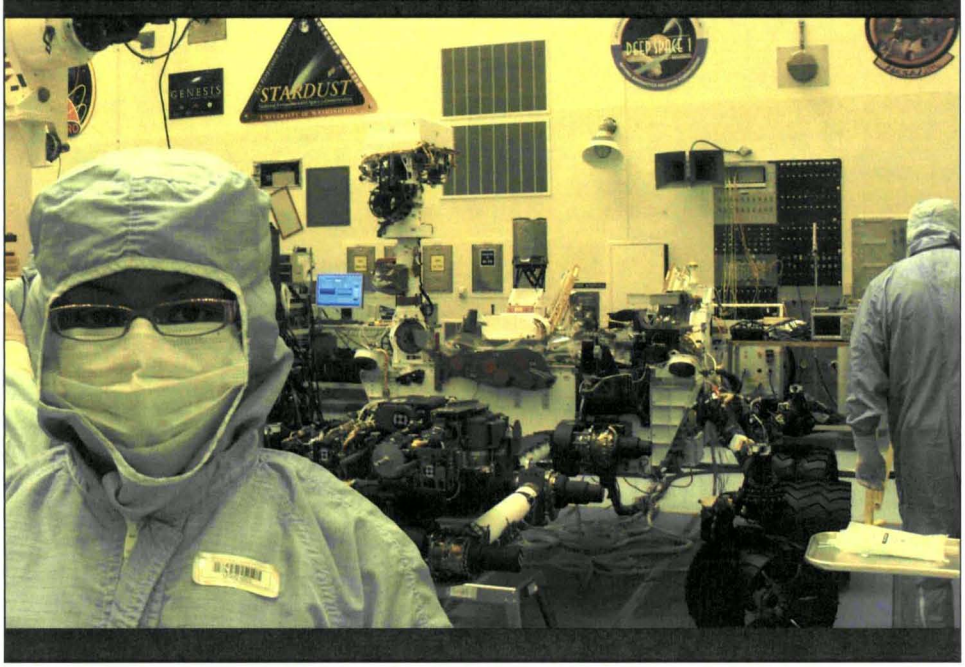
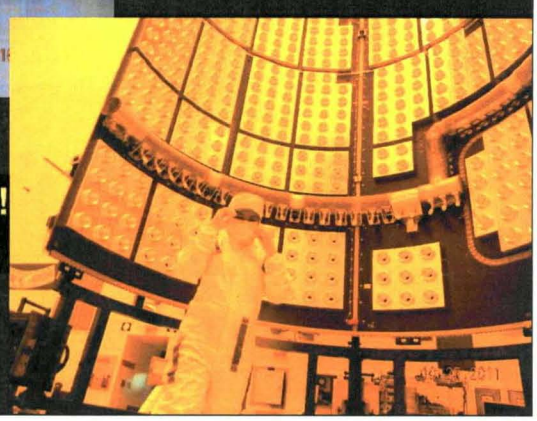
The Rover Arrived in Florida on June 22, 2011

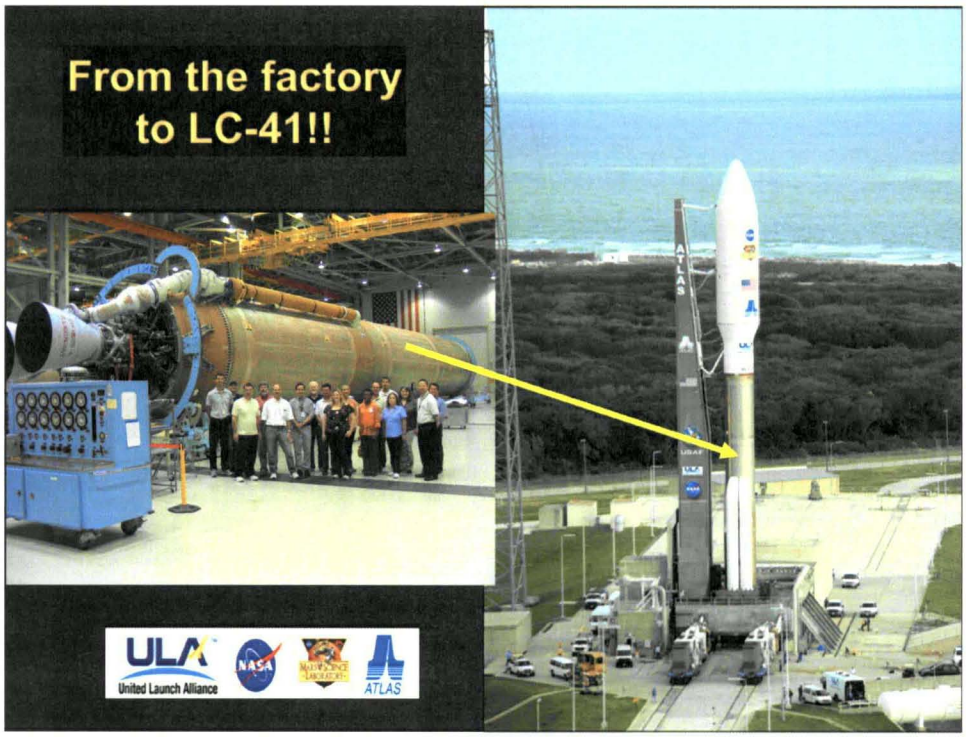


Transport of the Atlas V and Centaur from Decatur, AL to Cape Canaveral, FL (July 2011)

Spacecraft processing is complete. The payload fairing is ready.

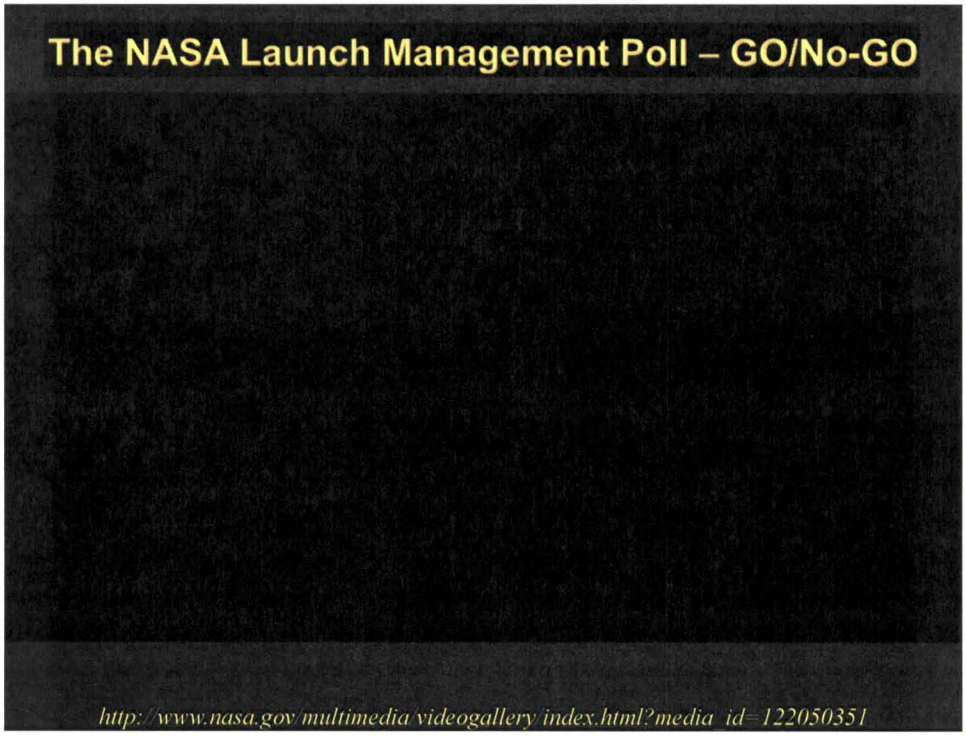
It's time to encapsulate! Oct. 24 - Nov 2, 2011




From the factory
to LC-41!!
ULA
United Launch Alliance
NASA
ATLAS


Day of Launch Operations – Nov. 26, 2011
ULA

The NASA Launch Management PoII – GO/No-GO



http://www.nasa.gov/multimedia/videogallery/index.html?media_id=122050351

The flight profile describes the vehicle's behavior during ascent through separation of the spacecraft.

3-2-1-0...and LIFT-OFF!!!!!!!

http://www.nasa.gov/multimedia/videogallery/index.html?media_id=122049781

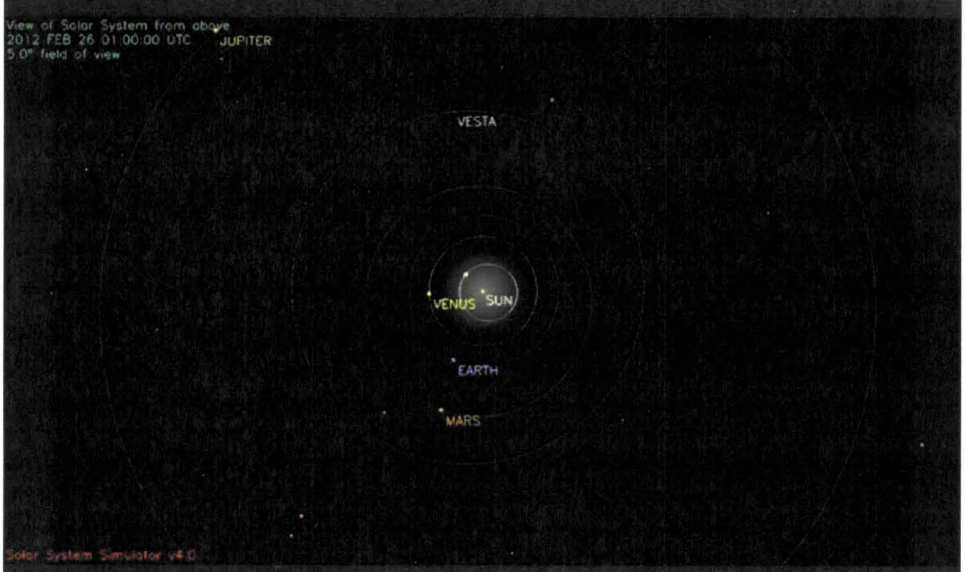
Spacecraft Separation...

http://www.nasa.gov/multimedia/videogallery/index.html?media_id=122054061

Earth and Mars on Day of Launch
November 26, 2011

Solar System Simulator - http://space.jpl.nasa.gov/

Earth and Mars Launch + 3 Months
February 26, 2012



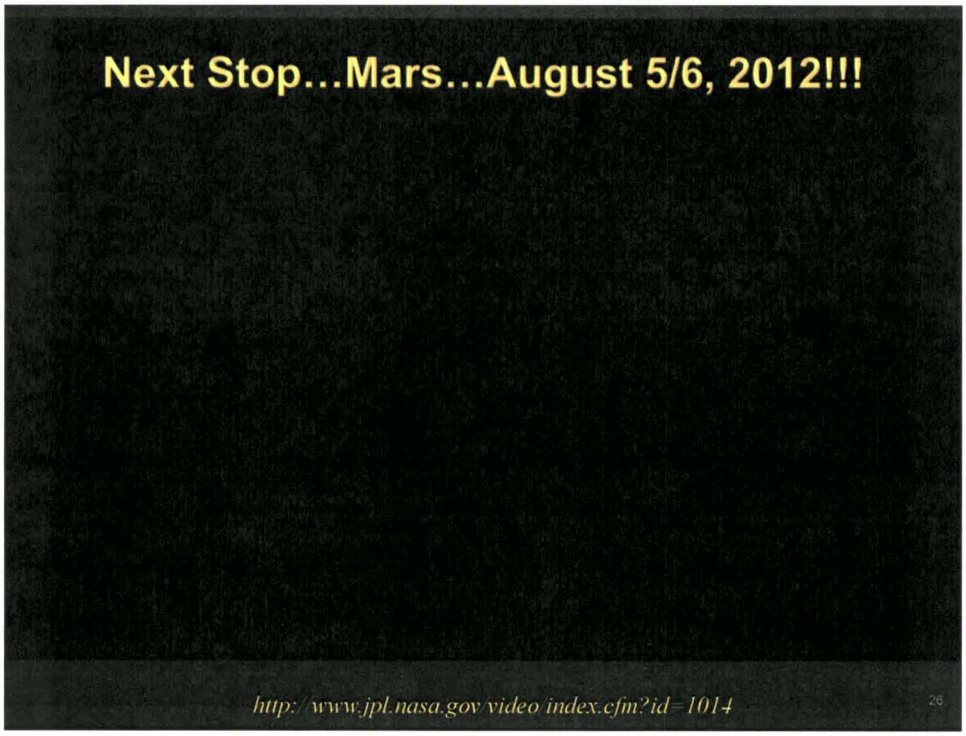
Solar System Simulator - http://space.jpl.nasa.gov/

Earth and Mars at L + 6 Months
May 26, 2011

Solar System Simulator - http://space.jpl.nasa.gov

Earth and Mars on Landing Day
August 6, 2012

Solar System Simulator - http://space.jpl.nasa.gov


Next Stop…Mars…August 5/6, 2012!!!
http://www.jpl.nasa.gov/video/index.cfm?id=1014
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