CURIOSITY

Curiosity's First Six Months on Mars:
from touchdown to drilling rocks

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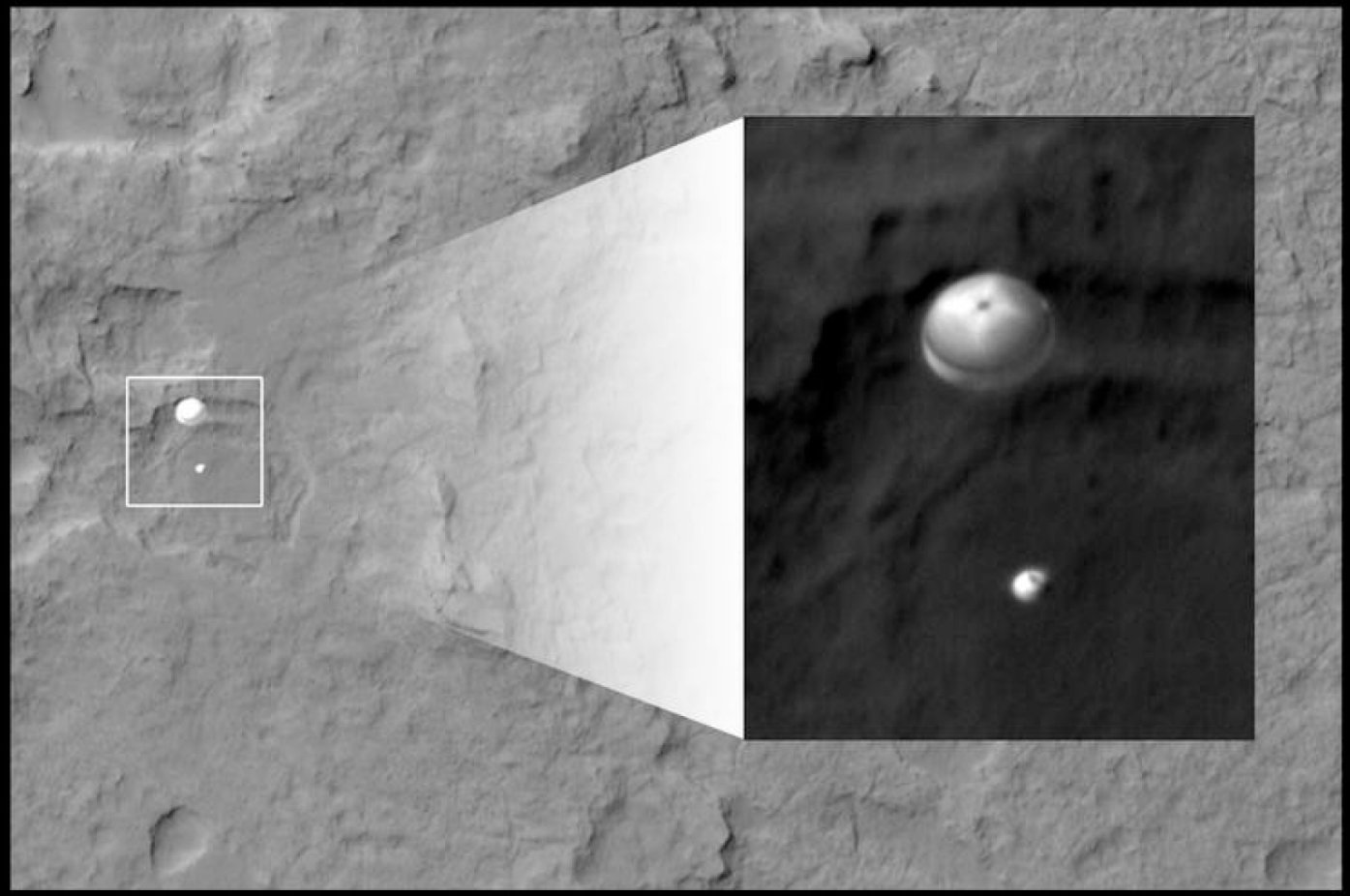
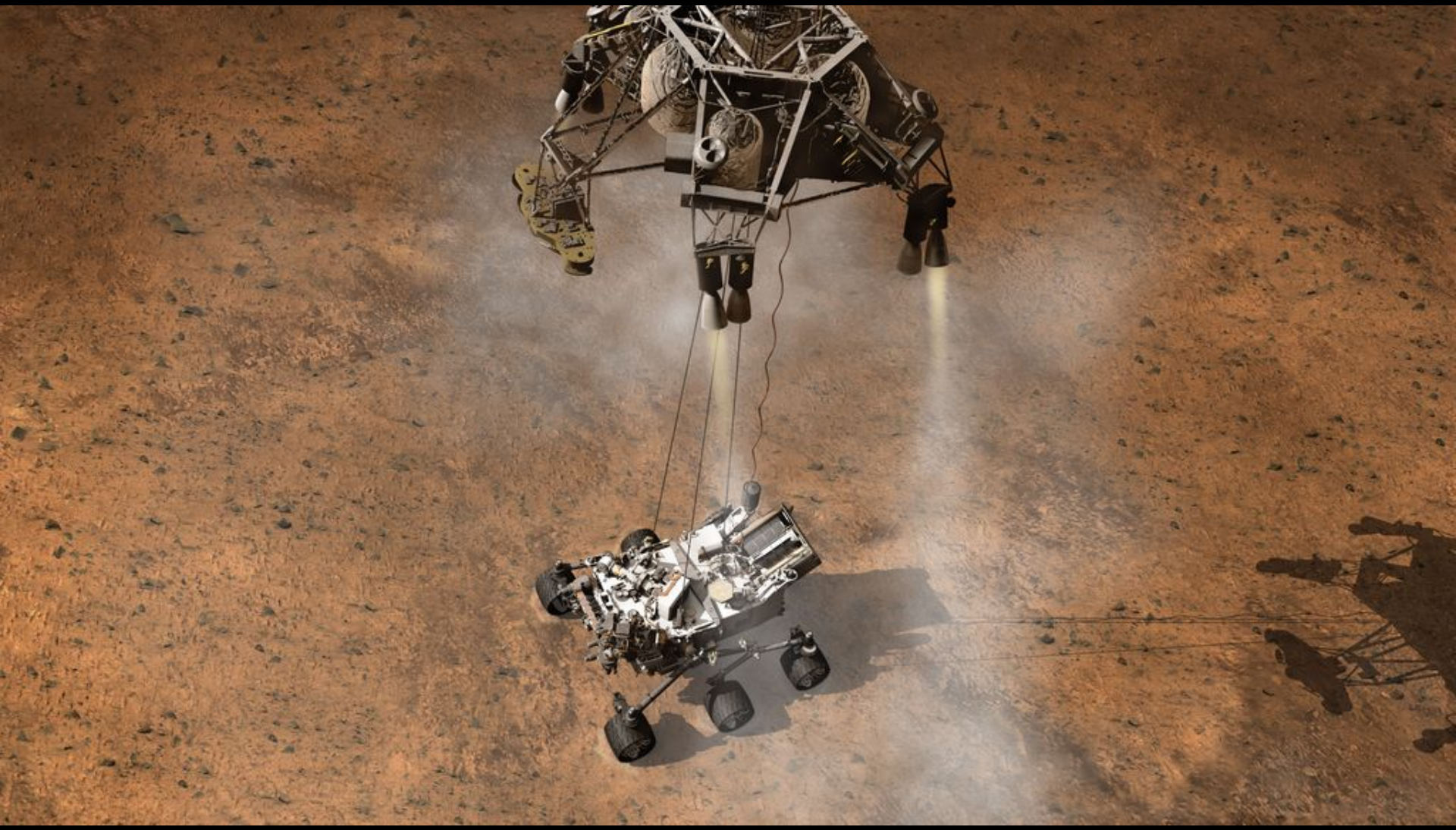
February 12, 2013

Curiosity landed on Mars August 5, 2012 (PDT)



The HiRISE camera on the Mars Reconnaissance Orbiter took this action shot of Curiosity descending on the parachute!

Touchdown with the Sky Crane Landing System

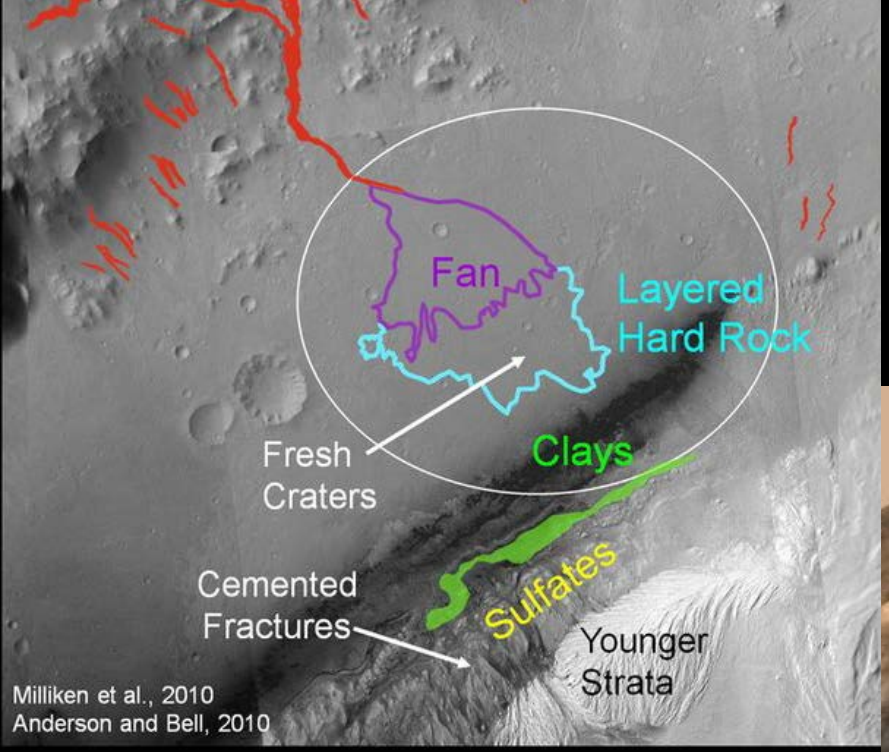


“Touchdown confirmed.”
“Let’s see where Curiosity will take us.”

Cheers break out in mission control!

NASA/JPL-Caltech

Curiosity's Science Objectives



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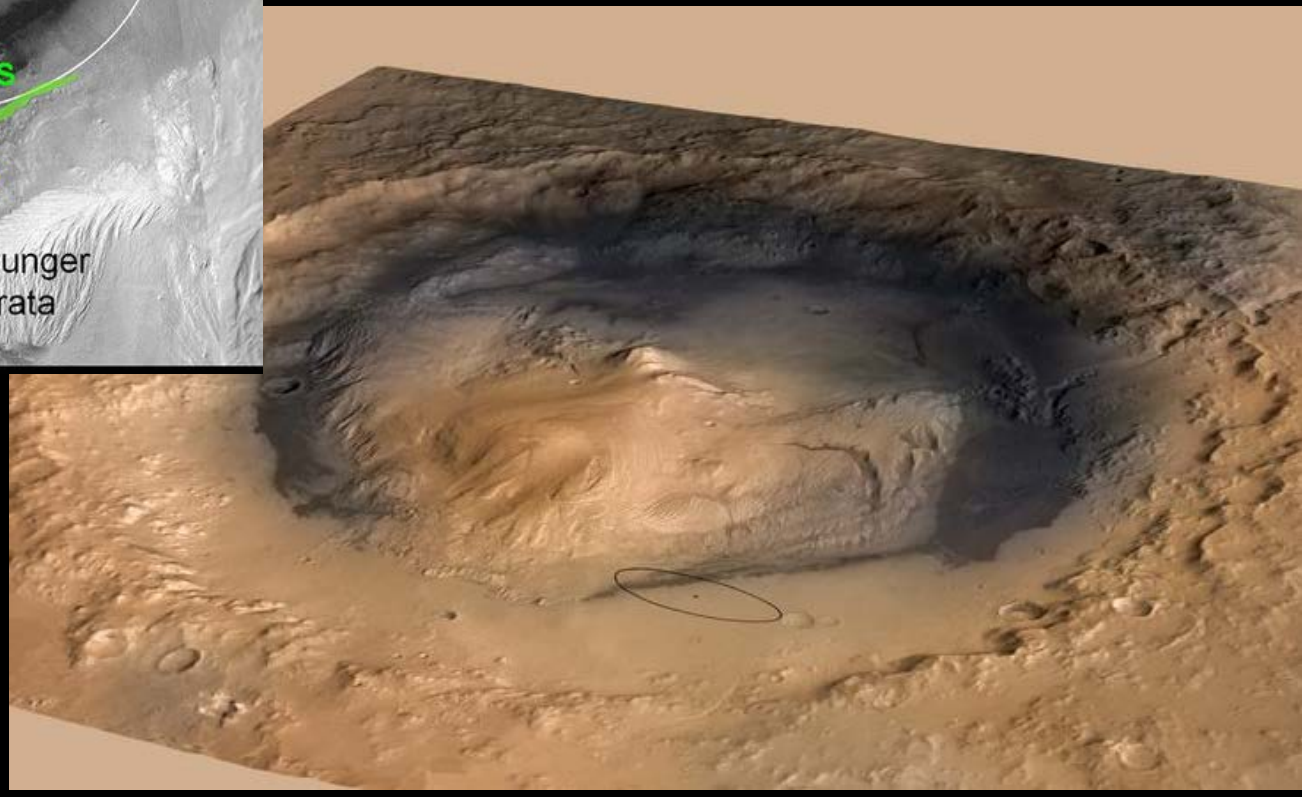
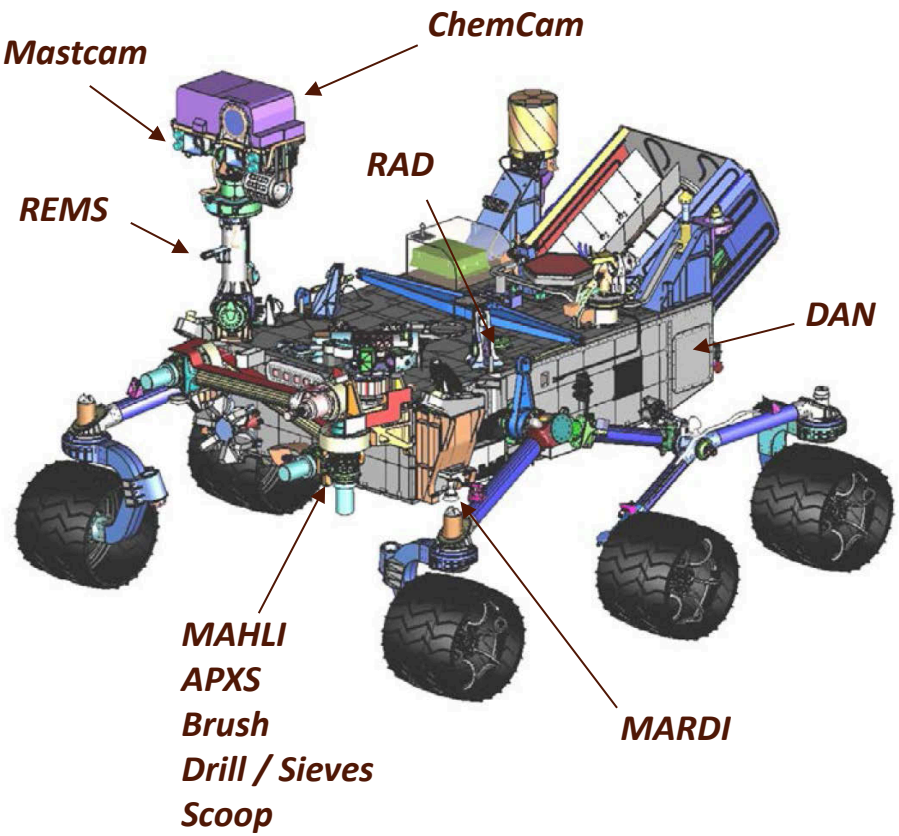


NASA/JPL-Caltech/ESA/DLR/FU Berlin/MSSS

Target: Gale Crater and Mount Sharp



Wheel Base:	**2.8 m**
Height of Deck:	**1.1 m**
Ground Clearance:	**0.66 m**
Height of Mast:	**2.2 m**
Mass:	**900 kg**

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/JPL-Caltech) - 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

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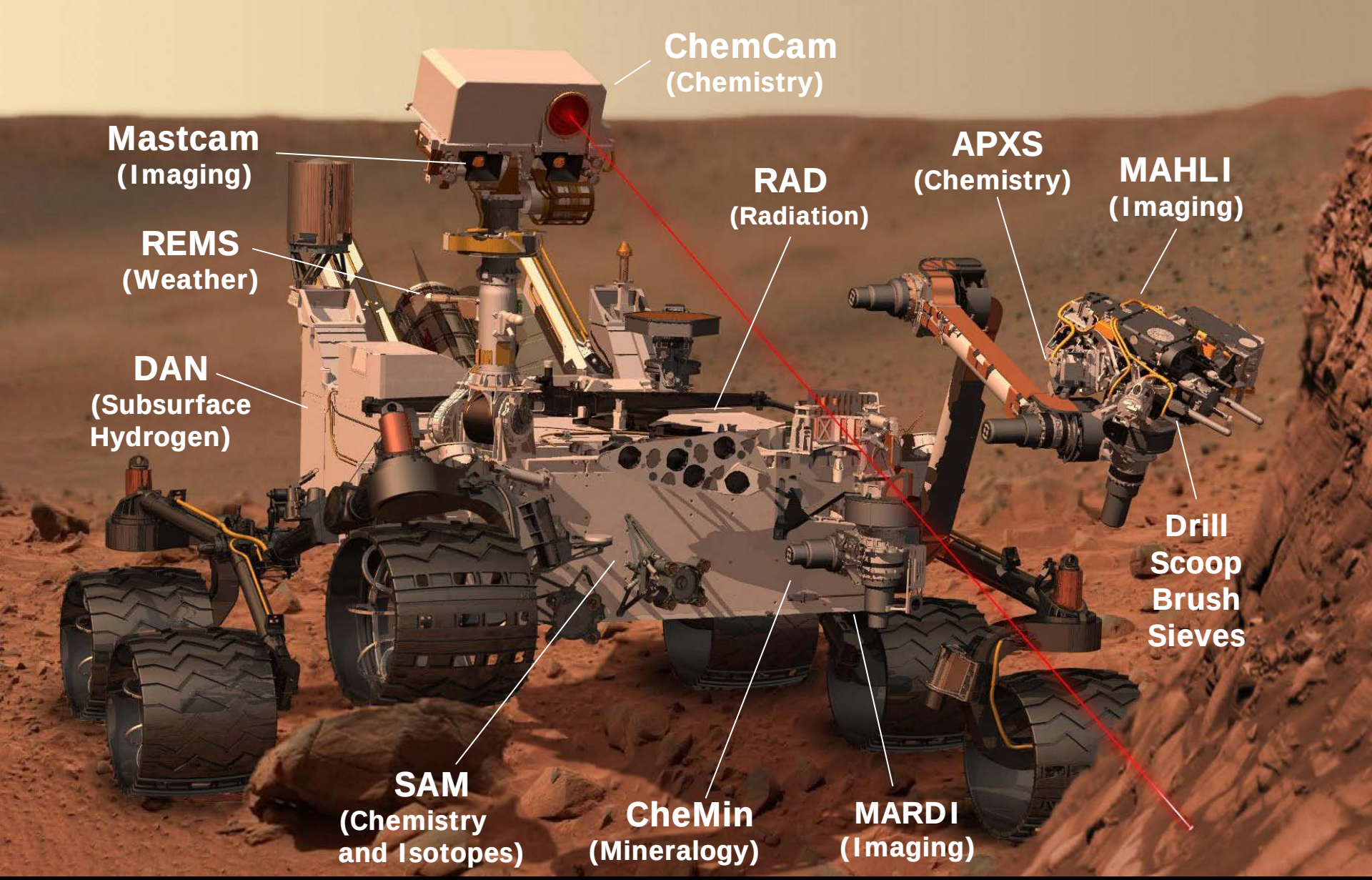
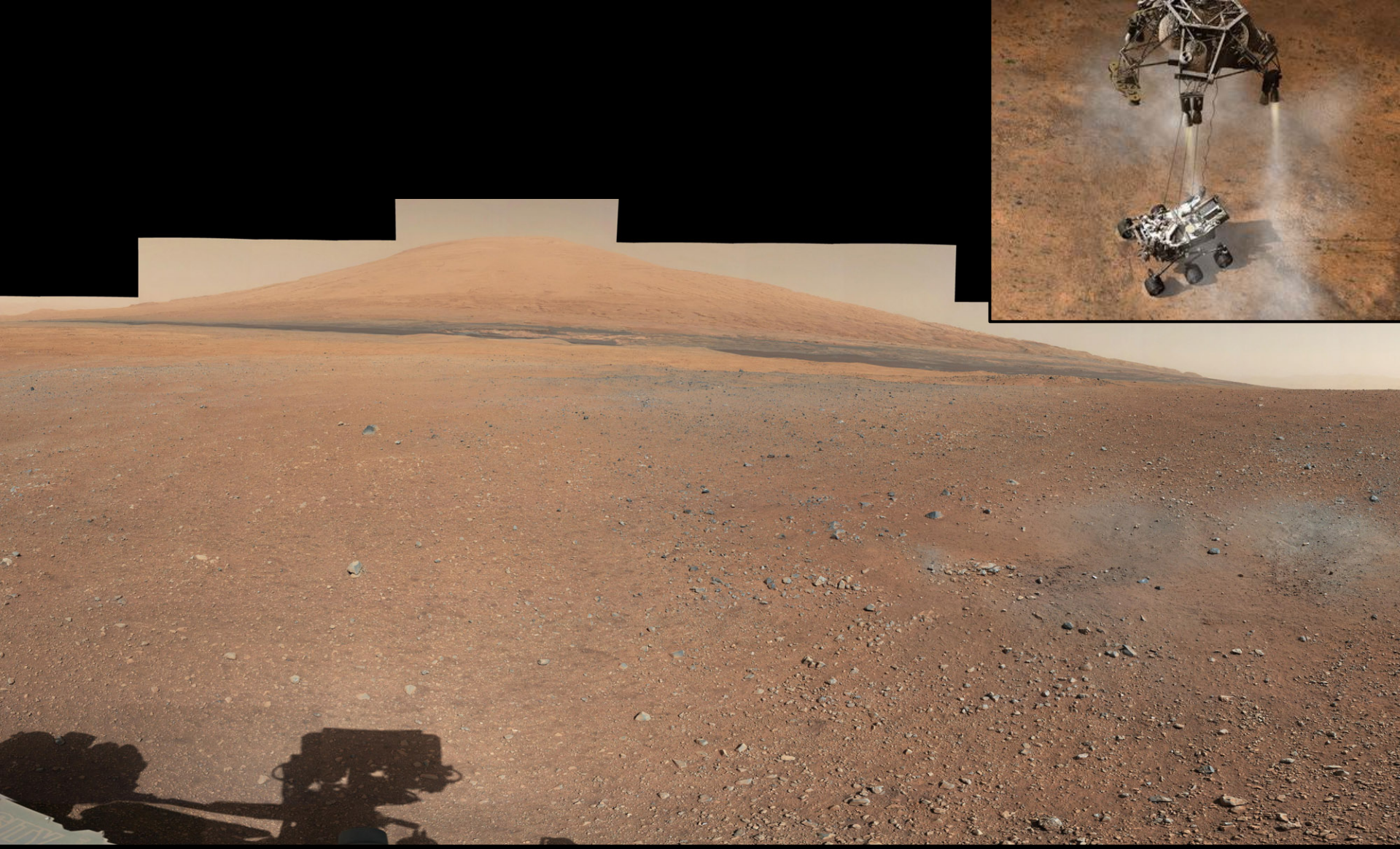
Curiosity's Investigation Teams



Curiosity's Science Payload

First Observations at Bradbury Landing



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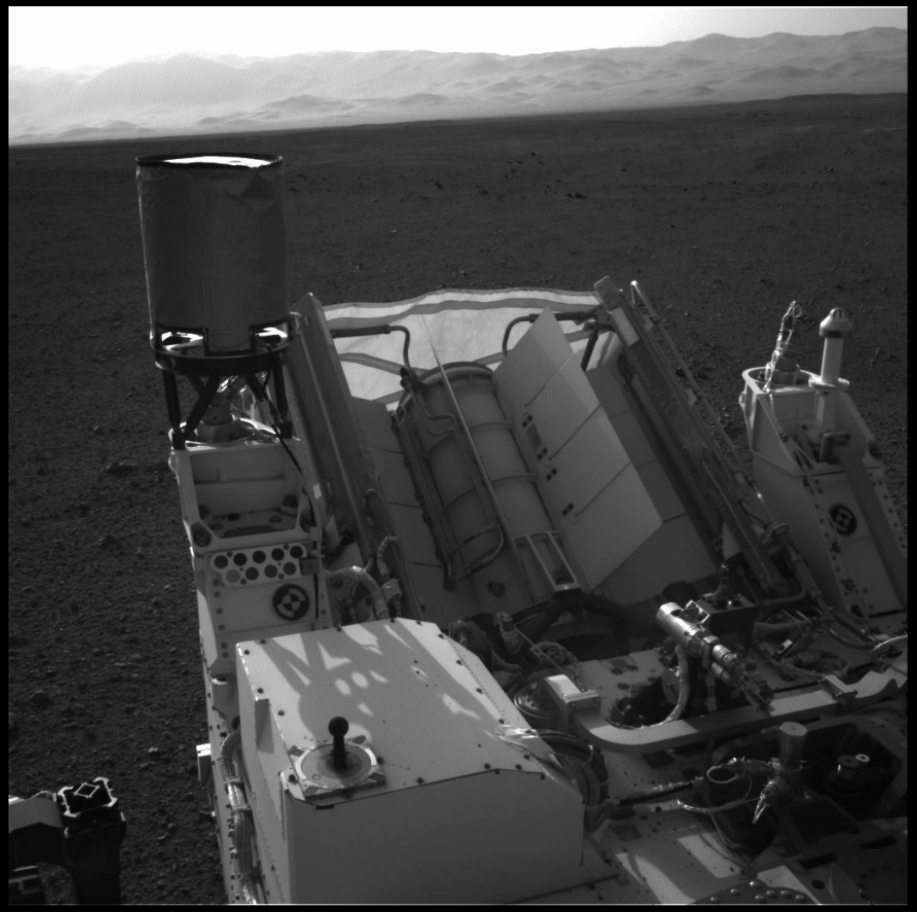
Mastcam-34 mosaic of Mount Sharp, descent rocket scours, and rover shadow

Navigation camera panorama of Bradbury Landing

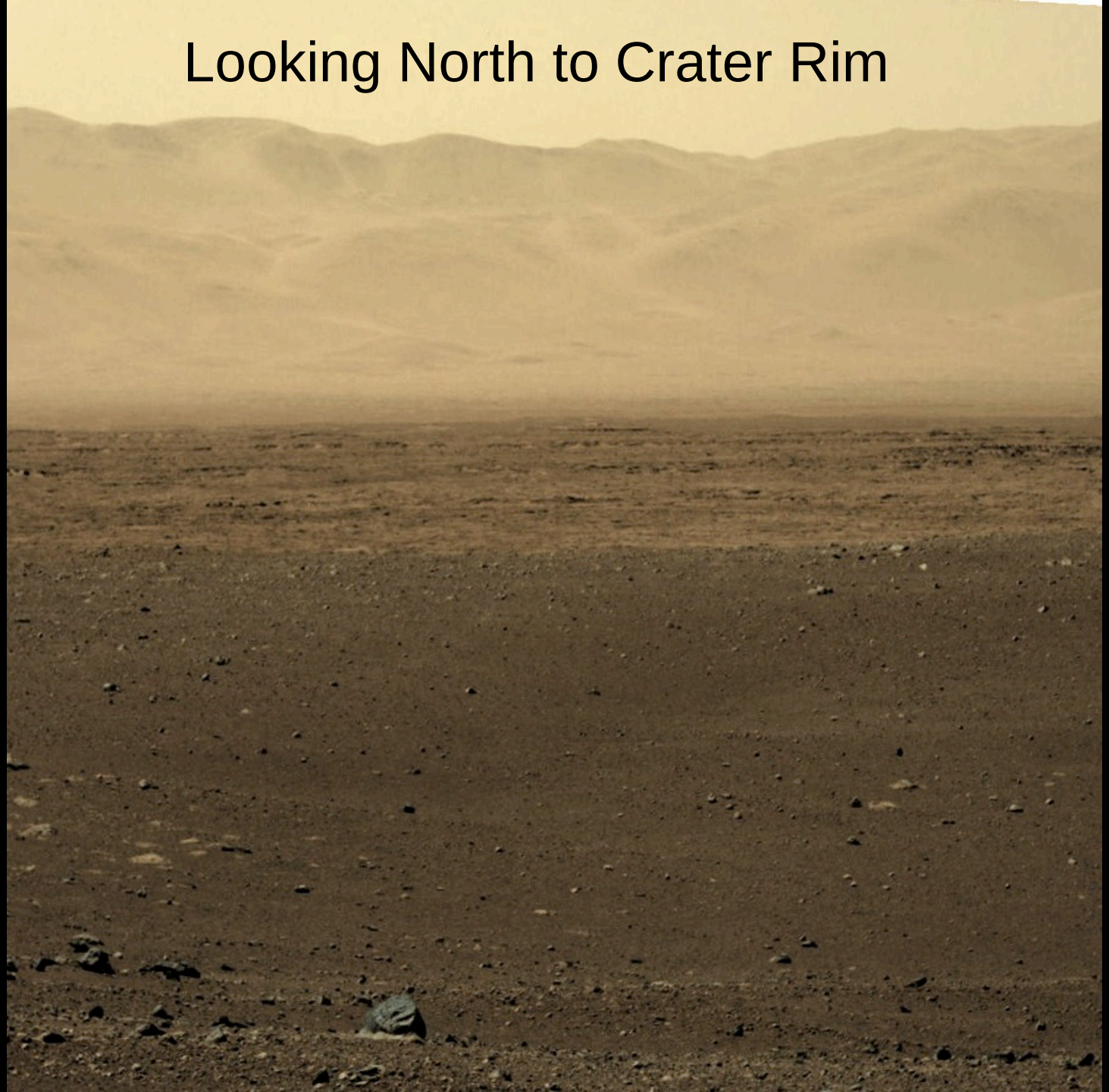


The Multi-Mission Radioisotope Thermoelectric Generator (MMRTG) on the MSL Rover was chosen for use to:

- maintain Rover electronics and science instruments within their specific thermal limits
  - The MMRTG waste heat is used by the MSL Rover's thermal subsystem
- enable operations of the rover at any latitude, enabling the consideration of the largest set of landing sites possible
- allow for obtaining the greatest number of science samples from all possible landing sites being considered by the Mars Program
- enable operations during the day or night
- enable navigation through challenging terrain without considering the view to the Sun
- enable science operations throughout the Martian year

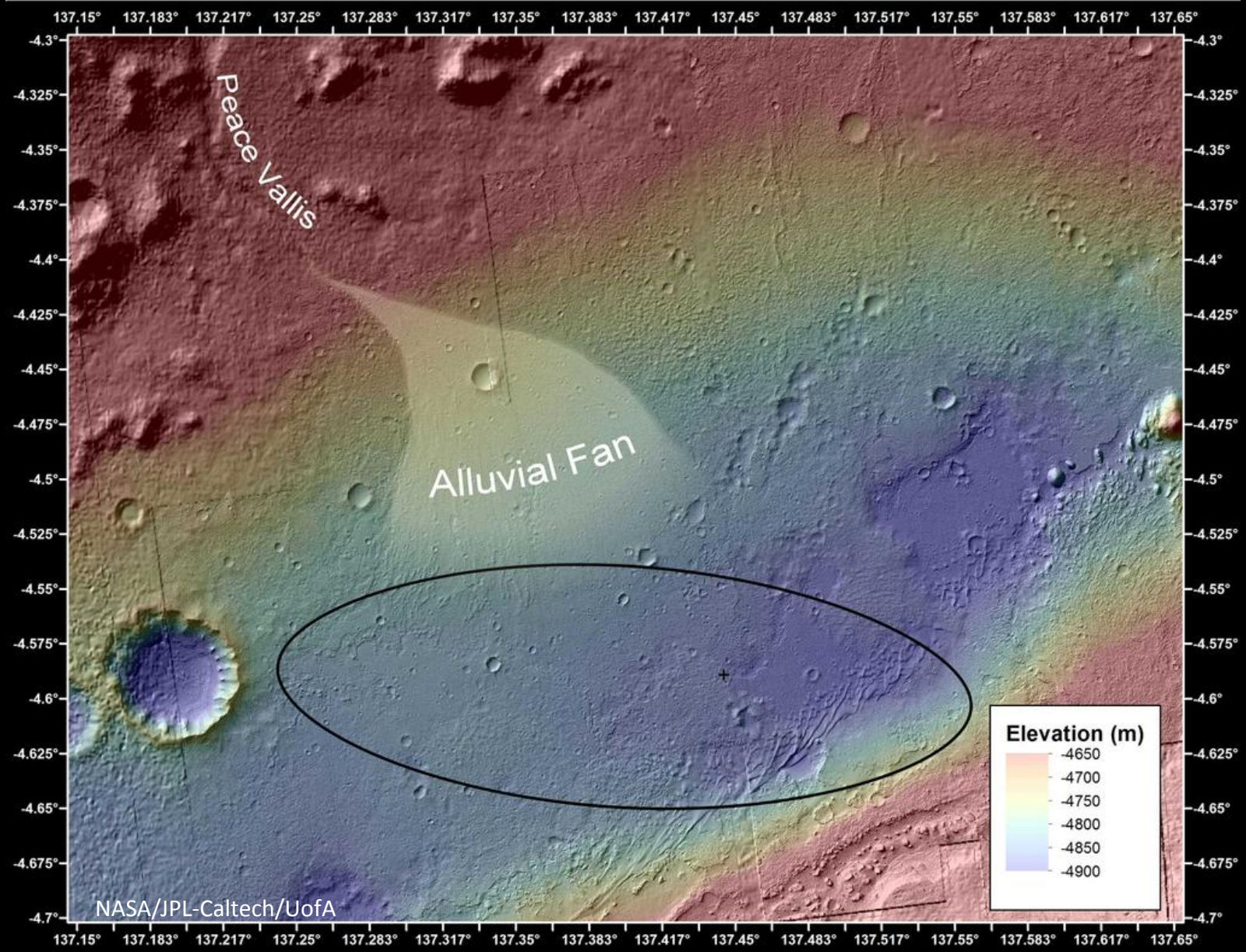
Curiosity on Mars with a Nuclear Power Source (NPS)

Looking North to Crater Rim



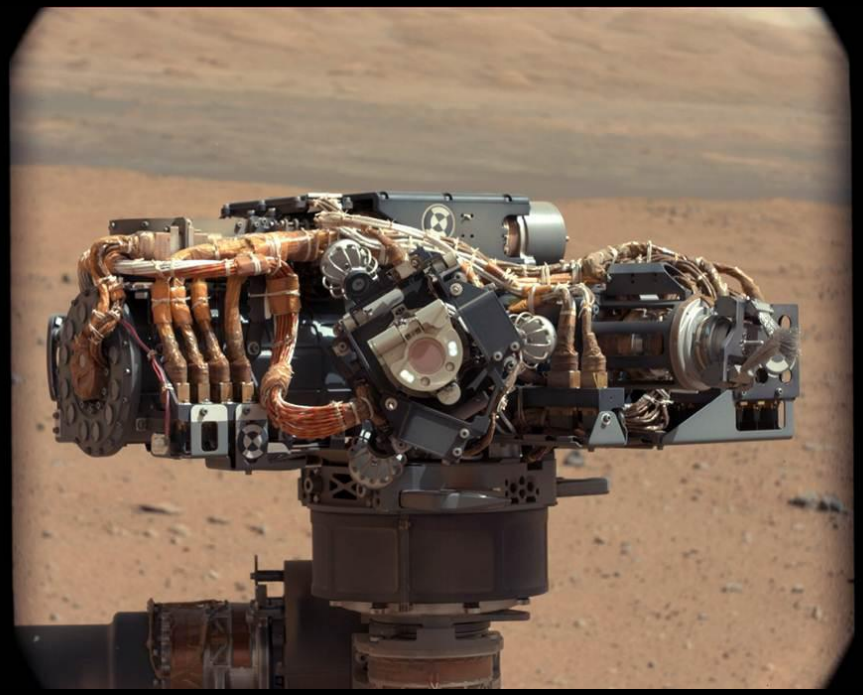
Stretching Out the Arm

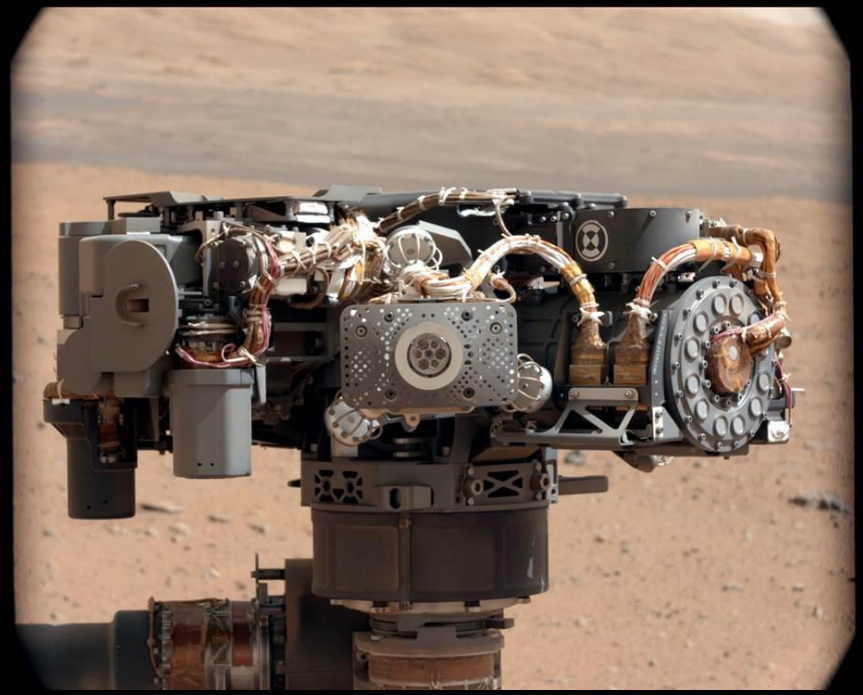
Driving!



Science results thus far reveals an ancient streambed, likely originating at the northern crater rim

MAHLI Portraits and Rocknest Scooping Campaign





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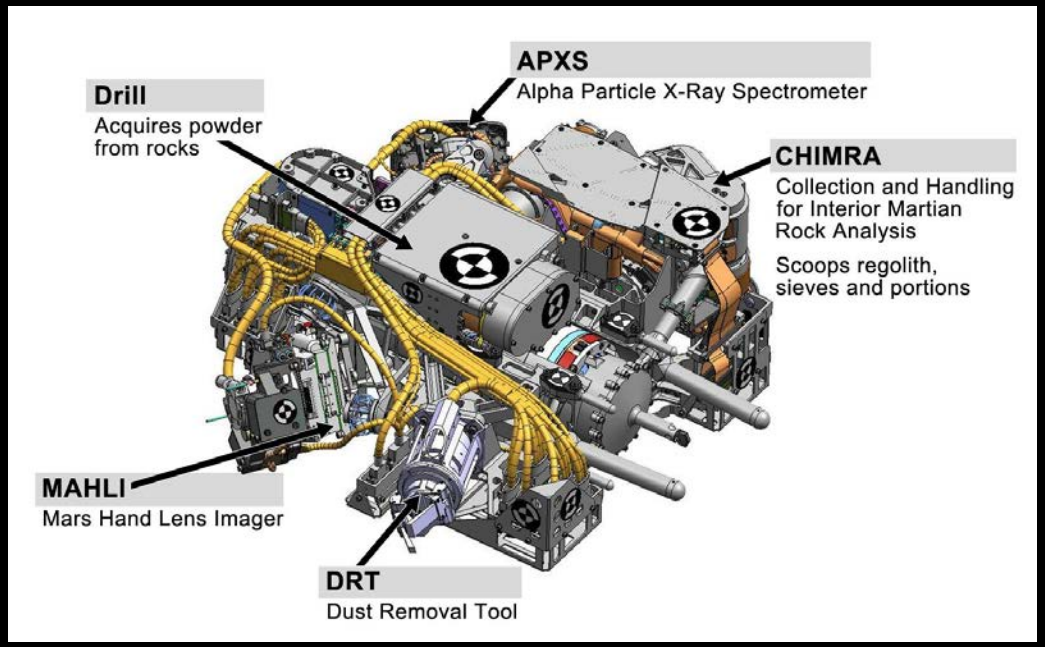
Images of Curiosity's turret centered on MAHLI (left) and APXS (right)



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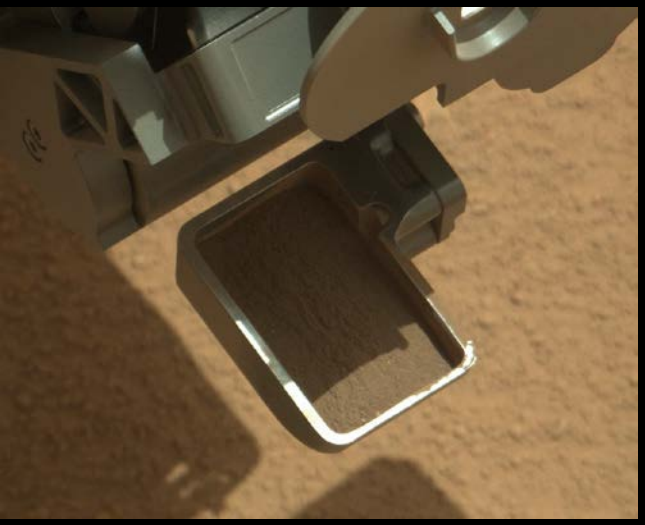
Curiosity images its undercarriage with its Mars Hand-Lens Imager

Wheel scuff to prepare for safe scooping

NASA/JPL-Caltech



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MAHLI view of coarse (0.5 to 1.5 mm) sand from the ripple's surface, and fine (< 0.25 mm) sand on wall and floor of trench

Curiosity self-portrait at Rocknest

Assembled from 55 MAHLI images

Shows four scoop trenches and wheel scuff

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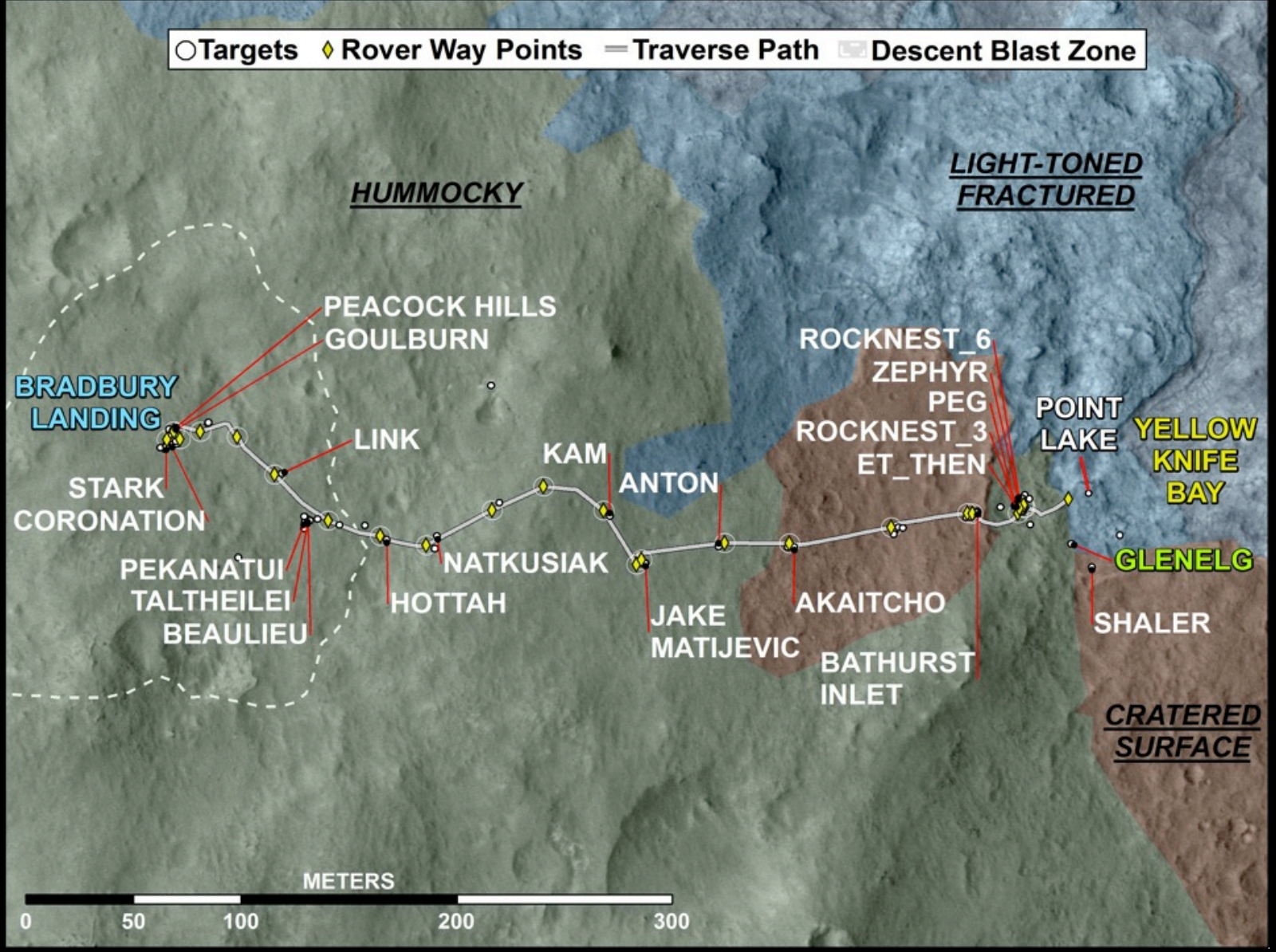
The Glenelg Region and Yellowknife Bay



NASA/JPL-Caltech/Univ. of Arizona

Curiosity is currently exploring Yellowknife Bay, a basin within the Glenelg region

NASA/JPL-Caltech/MSSS

Postcards from Yellowknife Bay showing a diversity of rock types, fractures, and veins

NASA/JPL-Caltech

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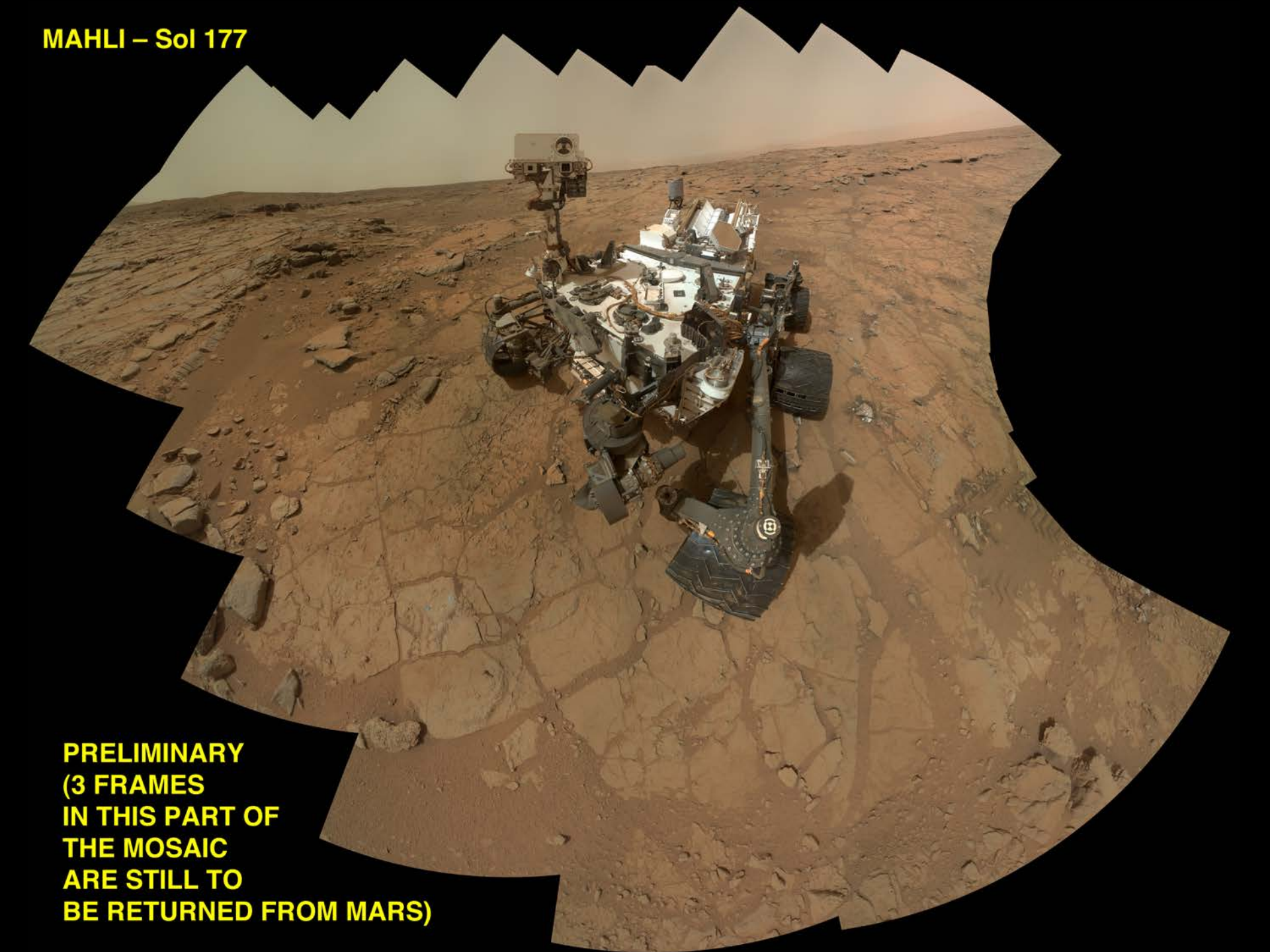
First use of dust-removing brush


MAHLI – Sol 177
PRELIMINARY
(3 FRAMES
IN THIS PART OF
THE MOSAIC
ARE STILL TO
BE RETURNED FROM MARS)

Curiosity's first surface contact with the drill on Mars was in Yellowknife Bay

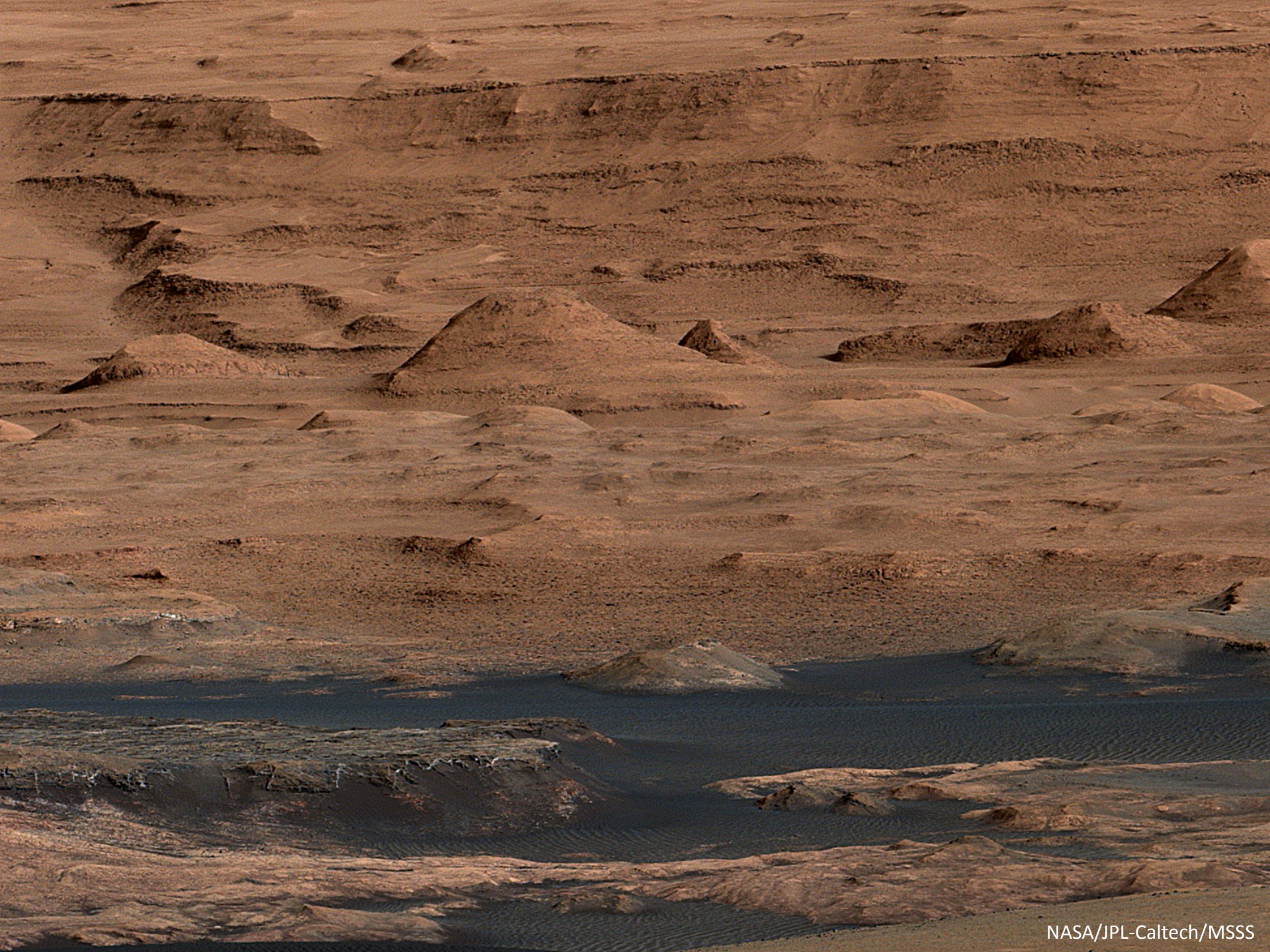
The first drill contact was a divot test using our percussive capabilities

Curiosity then went on to make her first drill hole on Mars!

Mount Sharp,
The Ultimate Destination

NASA/JPL-Caltech/Univ. of Arizona

Curiosity's ultimate goal is to explore the lower reaches of the 5-km high Mount Sharp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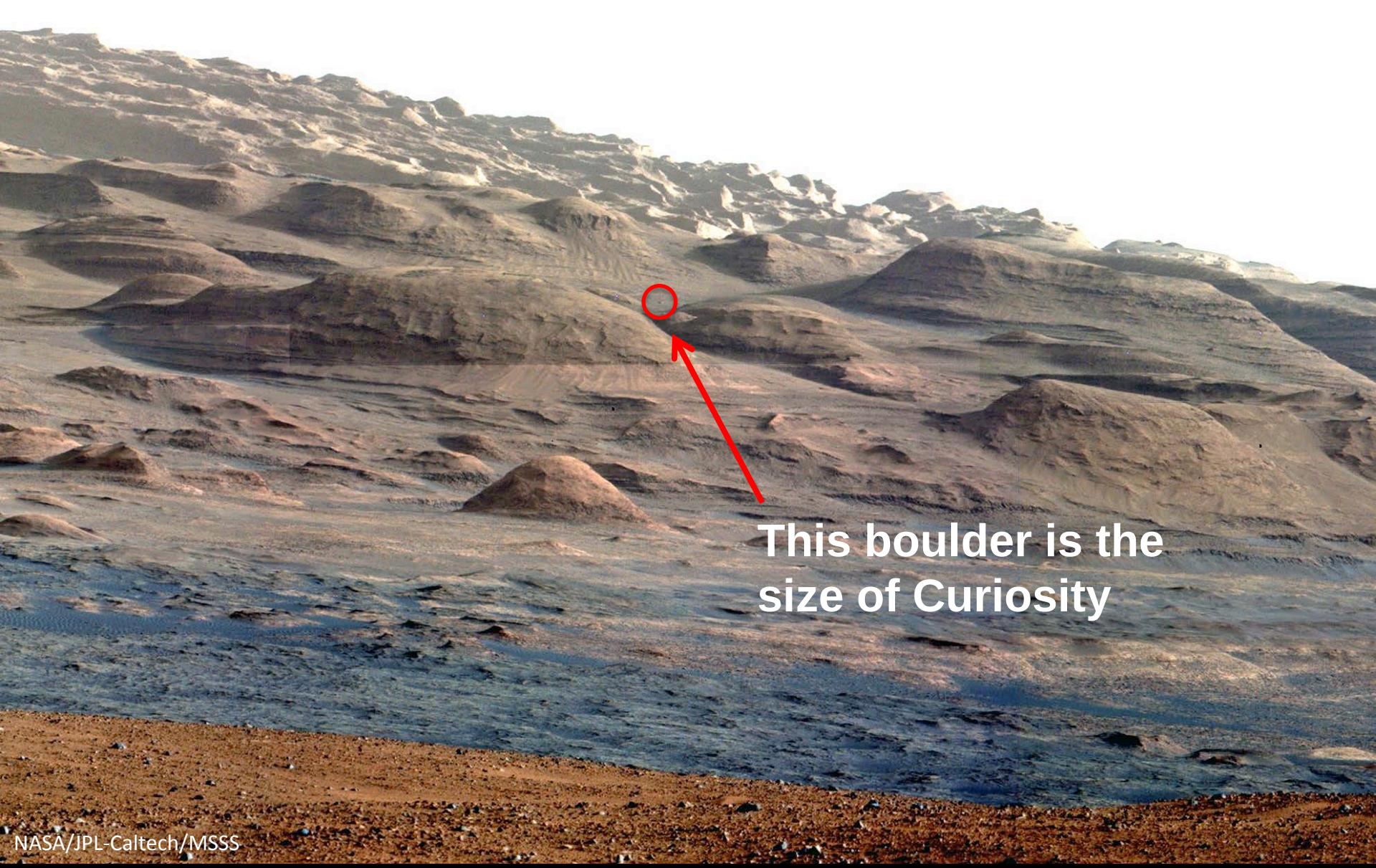

Layers, Canyons, and Buttes of Mount Sharp

Follow Curiosity as She Explores Gale Crater

Mission Website:

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