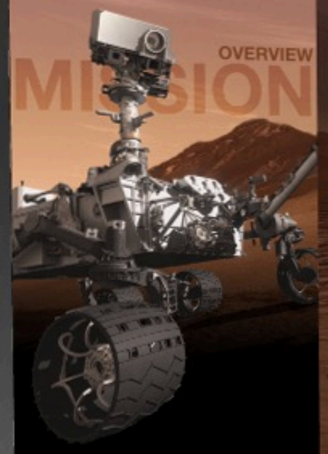
OVERVIEW

MISSION



Mars Science Laboratory is a large, mobile laboratory—the rover Curiosity—who's mission is to assess whether Mars ever was, or is still today, an environment able to support microbial life. In other words, its mission is to determine the planet's "habitability."

Science Goals

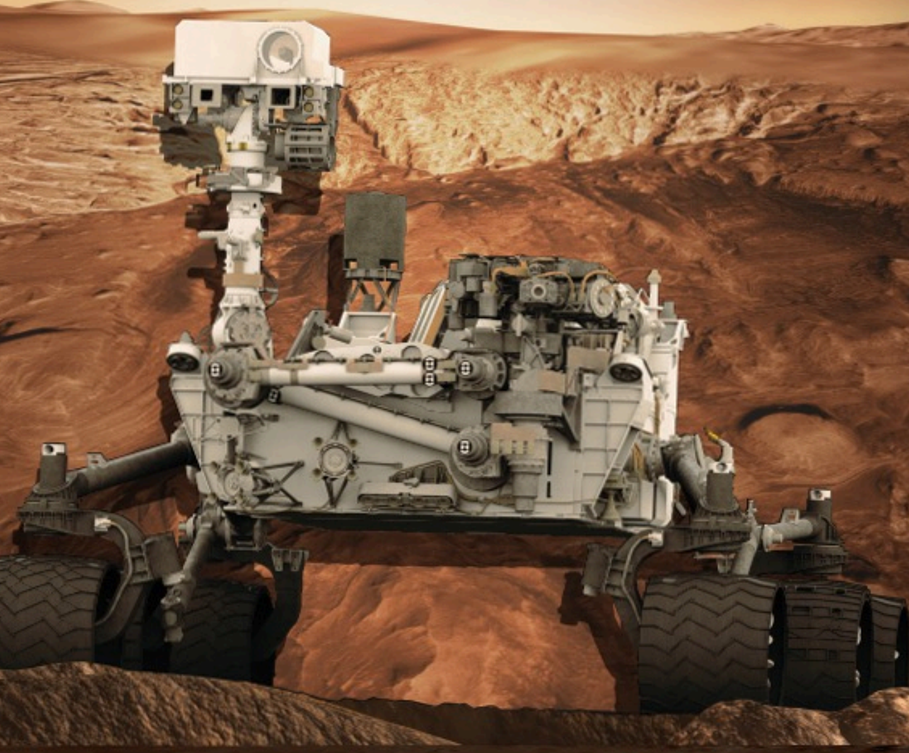
- Assessing the biological potential of the site by investigating organic compounds, other relevant elements, and biomarkers
- Characterizing geology and geochemistry, including chemical, mineralogical, and isotopic composition, and geological processes
- Investigating the role of water, atmospheric evolution, and modern weather/climate
- Characterizing the spectrum of surface radiation

NASA's Mars rovers keep getting bigger! Sojourner, the first rover on Mars was very small and didn't go far. Spirit and Opportunity are much bigger and have driven many times farther than expected. Mars Science Laboratory represents an even bigger leap: a capability yet will be able to carry its on-board chemistry lab long distance.

National Aeronautics and Space Administration

MSL

MARS SCIENCE LABORATORY



OVERVIEW

MISSION

Gale Crater Land Site

Gale Crater is a fascinating place to explore because of the mountain of layered materials in the middle. On Earth, this mound would be a mountain 5 kilometers (3 miles) high! The layers tell a story about what Mars was like in the past, perhaps spanning much of the history of the red planet. Studies from orbit have revealed that the layers have different minerals depending on their height. Near the bottom of the mound are clay minerals. Above the clay-bearing layers are layers with sulfur and oxygen-bearing minerals are above them.

Sky Crane represents the first use of a "soft-landing" technique employed at Mars. The sheer mass of MSL prevents engineers from using the familiar airbags to deliver their rover safely to the martian surface. When the vehicle has been slowed to nearly zero velocity, the rover will be released from the descent stage. A bridle and "umbilical cord" will lower the rover to the ground. When the on-board computer senses that touchdown is successful, it will cut the bridle.

MISSION OVERVIEW

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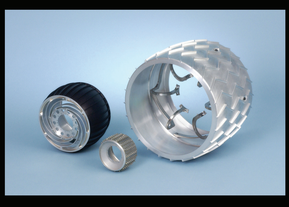

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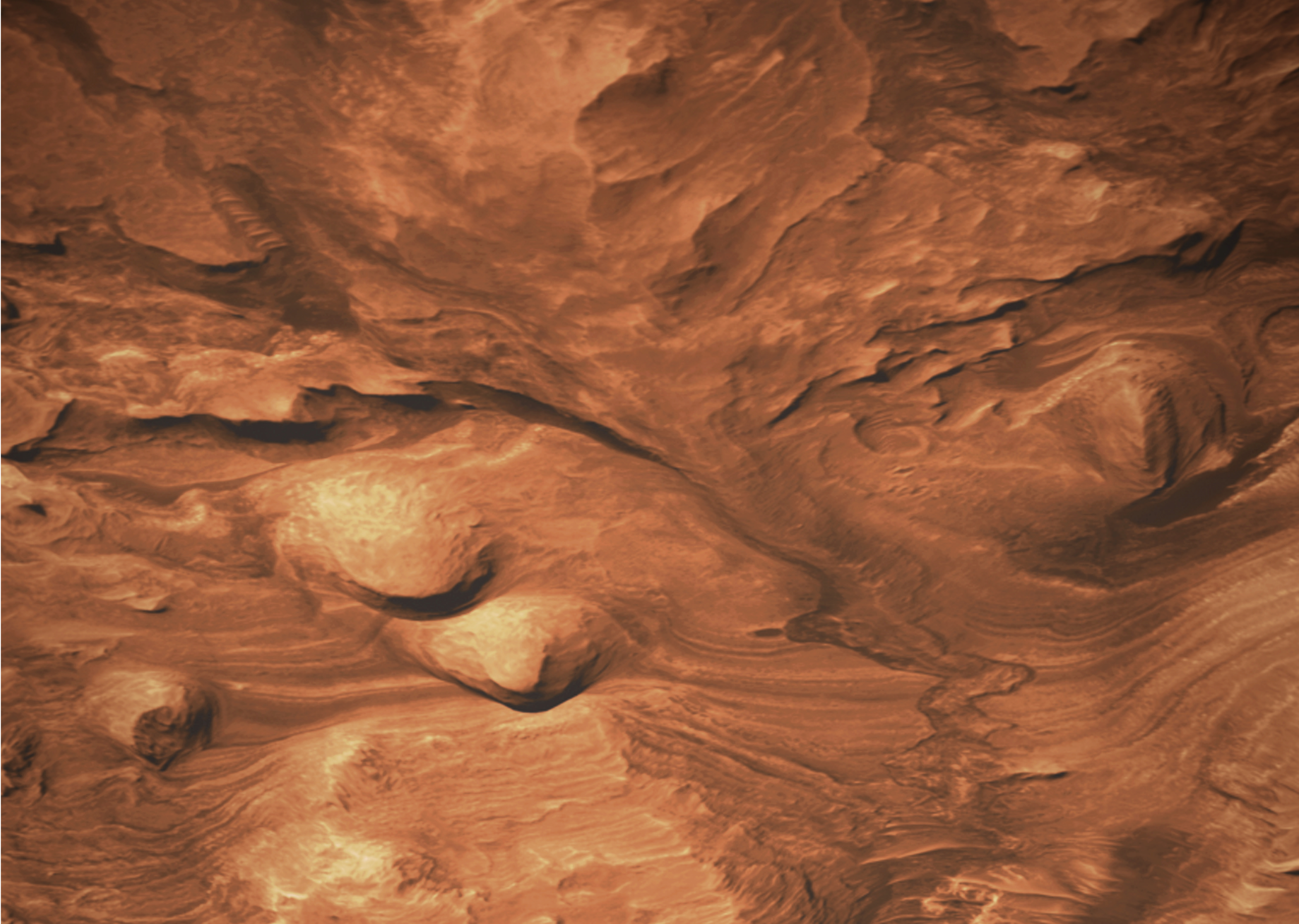
National Aeronautics and
Space Administration

MSL

MARS SCIENCE LABORATORY



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OVERVIEW

MISSION

Gale Crater Landing Site

Gale Crater is a fascinating place to explore because of the mountain of layered materials in the middle. On Earth, this mound would be a mountain 5 km (3 miles) high! The layers tell a story about what Mars was like in the past, perhaps spanning much of the early history of the red planet. Studies from orbit have revealed that the layers have different minerals depending on their height. Near the bottom of the mound are clay minerals. Above the clay-bearing layers are layers with minerals containing sulfur and oxygen. These different layers represent different environmental histories of Mars.

Sky Crane represents the use of a new "soft-landing" technique employed at Mars. The sheer mass of MSL prevents engineers from using the familiar airbags to deliver their rover safely to the martian surface. When the vehicle has been slowed to nearly zero velocity, the rover will be released from the descent stage. A bridle and "umbilical cord" will lower the rover to the ground. When the on-board computer senses that touchdown is successful, it will cut the bridle and fly away, leaving the rover on the surface.