

Curious about

NASA's Mars Science Laboratory landed safely in Gale Crater on the night of 5th/6th August 2012. Ahead are two years of experiments as the Curiosity rover trundles around at an average speed of 30 metres per hour.

Previous rovers have photographed the surface, while orbiters have given us an initial impression of the planet's surface geology. The new rover will be able to select rocks and soil of interest and carry out chemical analyses of them.



The NASA Mars Science Laboratory rover, Curiosity, seen during mobility testing in June 2011 at the Spacecraft Assembly Facility at NASA's Jet Propulsion Laboratory, Pasadena, California.

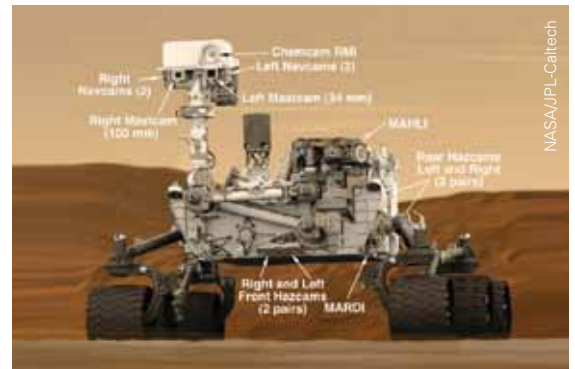
Landing on Mars

NASA developed the 'sky crane' used to drop Curiosity gently on the surface of Mars. Four rocket motors fired vertically downwards to slow the descent through Mars' thin atmosphere.



17 cameras

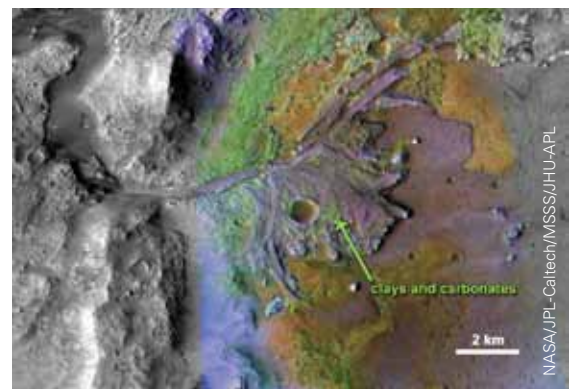
- Curiosity's two Mast Cameras take photographs of its surroundings. They have different focal lengths (34 mm and 100 mm).
- Also on the mast are four navigation cameras and the Remote Micro Imager, part of the Chemistry instrumentation.
- Eight hazard cameras ensure that Curiosity doesn't run into obstacles.
- MAHLI is the Hand Lens Imager, fitted to the end of a robotic arm.
- MARDI is the Descent Imager, used during the rover's landing.



Signs of life

Curiosity is searching for chemical traces of life. We already know that, at some time in its past, water flowed on the surface of Mars. The Jezero Crater delta was formed when water flowed into a large lake.

A spectrometer on board NASA's Mars Reconnaissance Orbiter analysed reflected light from rocks in the delta and showed that they contain clays and carbonates, substances which form when water is present.



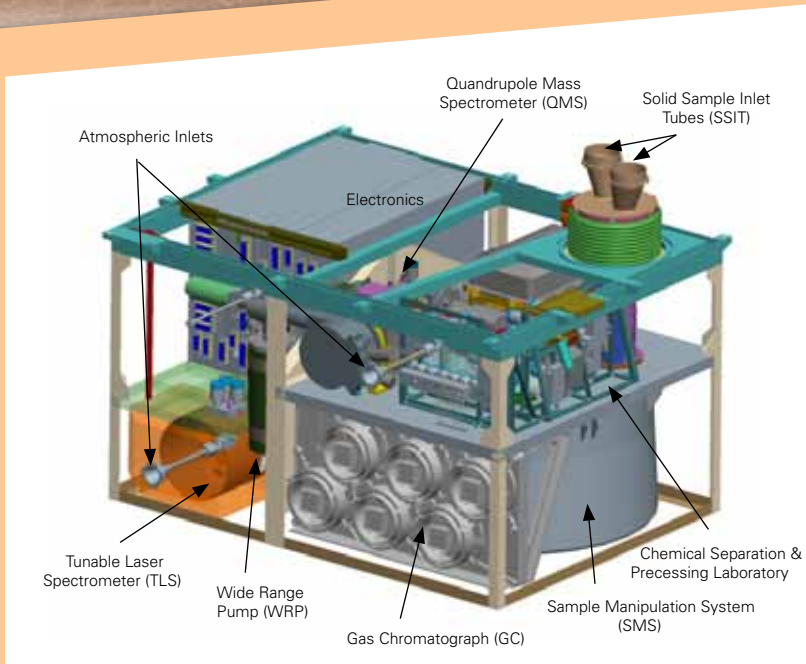
This image of Jezero Crater has been coloured to show the different minerals present.

Mars

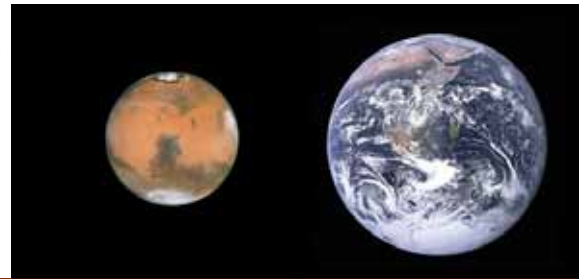
Chemistry lab

The Sample Analysis at Mars instrument (SAM) is a miniature chemistry lab which will analyse martian gases.

- Curiosity's robotic arm drops a sample into the Inlet Tube.
- The solid samples are heated to release gases in the Chemical Laboratory.
- The Gas Chromatograph separates the different gases.
- They then pass into the Mass Spectrometer and the Tunable Laser Spectrometer, where each is identified and the relative proportions measured.



The SAM chemistry lab will analyse martian rocks and atmospheric gases to find their chemical composition, together with the relative proportions of different isotopes.



Rock formation

Curiosity's image of Mount Sharp shows the layered rock formations in this part of the planet. Although this looks similar to sedimentary rocks on Earth, geologists know of several ways in which such striations can form – they don't necessarily show that these rocks were formed underwater.



	Mars	Earth
distance from Sun	227 million km	150 million km
orbital period	687 days	365 days
day length	24h 40m (1 sol)	24h 00m
radius	3380 km	6371 km
mass	6.4×10^{23} kg	6.0×10^{24} kg
tilt of axis	25°	23°
mean surface temperature	-63°C	+14°C
atmosphere	95% CO ₂ , 3% N ₂	78% N ₂ , 21% O ₂
atmospheric pressure	0.6 kPa	100 kPa

Look here!

NASA's Curiosity website is constantly updated with the mission's latest news and images:

http://www.nasa.gov/mission_pages/msl/index.html

