

# Mars

Mars is the fourth planet from the Sun. If Venus is the planet with a runaway "greenhouse effect", then Mars is the opposite; it doesn't have enough Carbon - Dioxide to trap enough of the Sun's energy for water to remain in liquid form.

Mars has an interesting history, early observers of the planet once thought that the bands of green were seas or Maria, and that the shape and intensity of these areas was due to the presence of lichen, or some similar plant life, that ebbed with the seasonal changes on Mars. They also thought they could see canals, which were to bring water from the poles to the dry areas on Mars. Observations by Mariner spacecraft showed the canals were a myth, and revealed the darker areas to be bedrock, possibly exposed and covered by Mars powerful winds. Mars is dotted with numerous impact craters, volcanoes and ancient riverbeds.

The presence of riverbeds and evidence of erosion due to flowing liquid water indicate that Mars was once much warmer, possibly due to volcanic activity, changes in axial tilt, or some other cause. The atmosphere which surrounds Mars today is insufficient to provide a climate warm enough for water to flow.

The Martian surface does not show evidence of plate tectonics, so continuous re-circulation of the crust, which wiped out much evidence of craters on Earth, did not occur on Mars. This probably would have doomed Mars to the thin atmosphere and desert conditions which exist on the planet today. The atmosphere is comprised mostly of Carbon - Dioxide (95%), nitrogen about 3%, argon about 1.5% and oxygen about 0.15% and trace amounts of water vapour and other elements. Even though Mars contains a lot of Carbon - Dioxide it is just too thin to generate a warmer environment.

Ground based observers have detected planet-wide dust storms with winds approaching the speed of sound. Mars has a slight magnetic field, which indicates that it probably does not have a molten iron core, however the surface seems to have an abundance of iron which gives the planet its red colour. The Viking spacecraft which landed on Mars in 1976, tested for the presence of life in the soil of Mars, using a series of three tests. The results were mixed, but at the time it was generally accepted that there was no life on Mars.

The Mars Pathfinder mission in September (1997) provided evidence that Mars was once much warmer than it is today and that liquid water once flowed over its surface.

A direct study of the Martian soil and rocks in 2004 has confirmed evidence of water presence in the past and some encouraging signs of conditions for basic cell life. However we still have no definite answer to the question of life on Mars.

Mars is best observed near an opposition that occurs when Mars is at its closest to earth, (usually 30 days either side of this date).

## Planet Data

Mass (kg)  $6.5362 \times 10^{23}$

Diameter (km) 6795

Sidereal Period (days) 686.98

Axis Rotation (days, hours, mins) 1d 0h 37.4m

Mean distance from Sun 1.52 A.U.

Density (water=1) 3.9

Maximum surface temperature - 20 °C

Minimum surface temperature -140 °C

Albedo 0.15

Tilt 25.19

Number of Satellites 2 (Phobos and Deimos)

Visual Magnitude at 1 AU -1.52