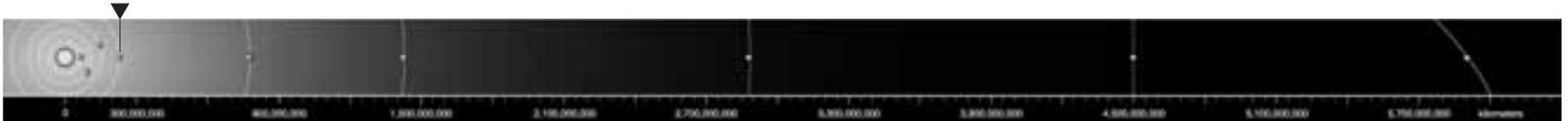
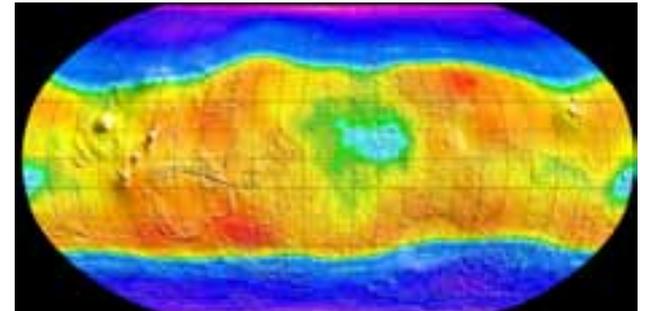
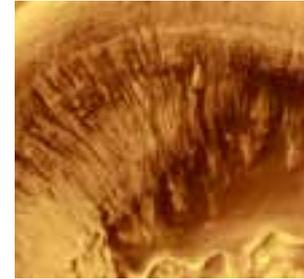
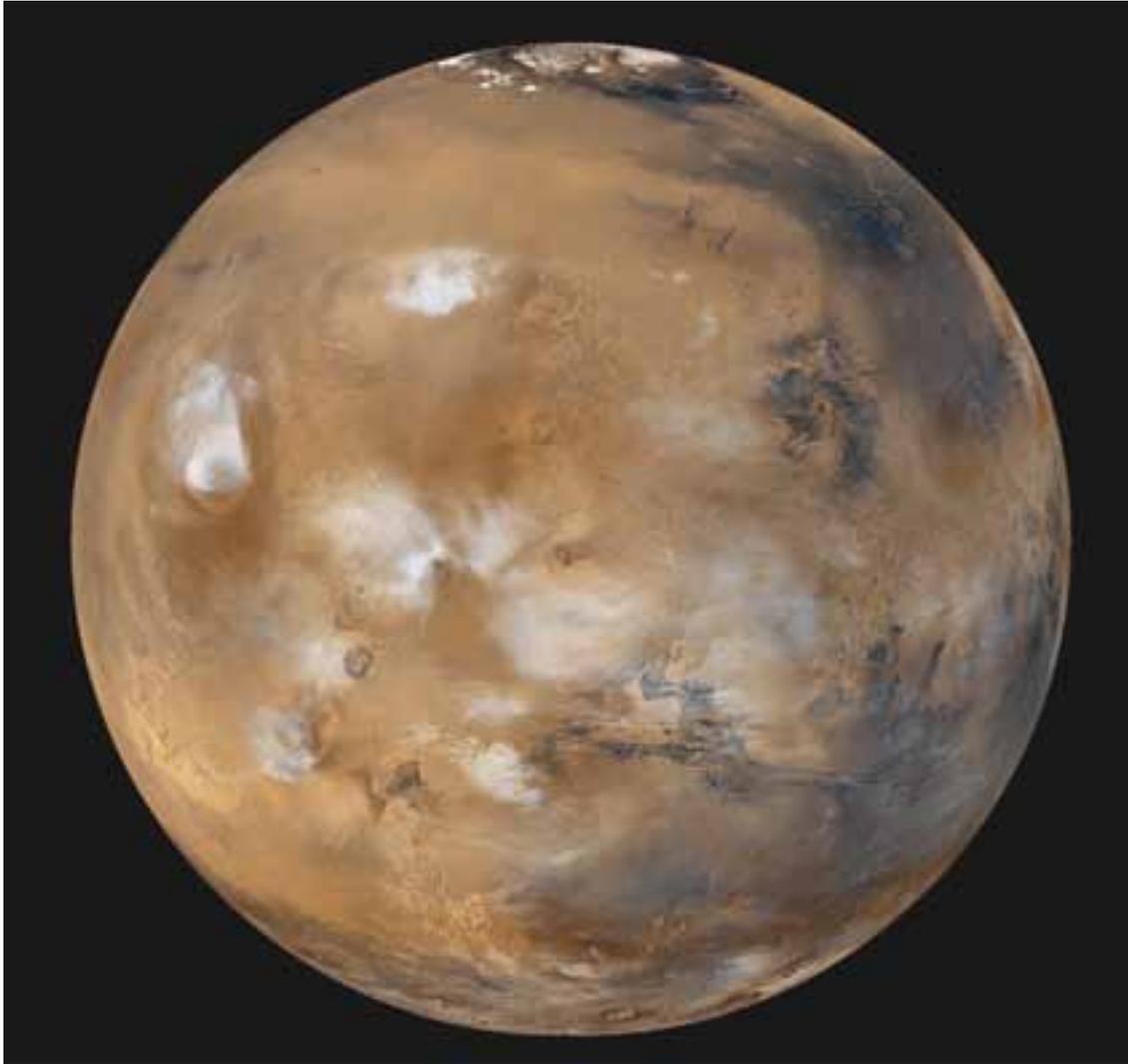


Mars





Though details on Mars' surface are difficult to see from Earth, telescope observations show seasonally changing features and white patches at the poles. For decades, people speculated that bright and dark areas on Mars were patches of vegetation, that Mars could be a likely place for life forms, and that water might exist in the polar caps. When the Mariner 4 spacecraft flew by Mars in 1965, many were shocked to see photographs of a bleak, cratered surface. Mars seemed to be a dead planet. Later missions, however, have shown that Mars is a complex member of the solar system and holds many mysteries yet to be solved.

Mars is a rocky body about half the size of Earth. Like the other terrestrial planets — Mercury, Venus, and Earth — its surface has been altered by volcanism, impacts, crustal movement, and atmospheric effects such as dust storms. Mars' polar ice caps grow and recede with the seasons; layered areas near the poles suggest that the planet's climate has changed more than once.

Mars has no global magnetic field as does Earth. However, NASA's Mars Global Surveyor orbiter found that areas of the martian crust in the southern hemisphere are highly magnetized — evidently traces of Mars' magnetic field remained in the planet's crust from about 4 billion years ago.

Scientists believe that Mars experienced huge floods about 3.5 billion years ago. Though we do not know where the ancient flood water came from, how long it lasted, or where it went, recent missions to Mars have uncovered intriguing hints.

In 2002, NASA's Mars Odyssey orbiter detected hydrogen-rich polar deposits, indicating large quantities of water ice close to the surface. Further observations found hydrogen in other areas as well. If water ice permeated the entire planet, Mars could have substantial subsurface layers of frozen water. In 2004, the Mars Exploration Rover named Opportunity found structures and minerals indicating that its landing site was once the shoreline of a salty martian sea. The rover's twin, Spirit, also found the signature of ancient water at its landing site halfway around Mars from Opportunity's location.

Many questions remain. The cold temperatures and thin atmosphere on Mars don't allow liquid water to exist at the surface

for long, and the quantity of water required to carve Mars' great channels and flood plains is not evident today. Unraveling the story of water on Mars is important to unlocking its climate history, which will help us understand the evolution of all the planets. Water is also believed to be an essential ingredient for life; evidence of past or present water on Mars is expected to hold clues about whether Mars could ever have been a habitat for life.

Volcanism in the highlands and plains stopped 3 billion years ago, but some of the giant shield volcanoes are younger, forming between 1 and 2 billion years ago. Mars has the largest volcanic mountain in the solar system, Olympus Mons, as well as a spectacular equatorial canyon system, Valles Marineris. The length of Valles Marineris is equivalent to the distance from New York to Los Angeles.

Mars has two small moons, Phobos and Deimos. Although it is not known how they formed, they may be asteroids snared by Mars' gravity.

FAST FACTS

Namesake	Roman god of war
Mean Distance from the Sun	227.94 million km (141.63 million mi)
Orbit Period	1.8807 Earth years (686.98 Earth days)
Orbit Eccentricity (Circular Orbit = 0)	0.0934
Orbit Inclination to Ecliptic	1.8 deg
Inclination of Equator to Orbit	25.19 deg
Rotation Period	24.62 hr
Successive Sunrises	24.660 hr
Equatorial Radius	3,397 km (2,111 mi)
Mass	0.10744 of Earth's
Density	3.934 g/cm ³ (0.714 of Earth's)
Gravity	0.38 of Earth's
Atmosphere Primary Components	carbon dioxide, nitrogen, argon
Temperature Range	-143 to 17 deg C (-225 to 63 deg F)
Known Moons*	2
Rings	0

*As of November 2005.

SIGNIFICANT DATES

1877 — Asaph Hall discovers the two moons of Mars, Phobos and Deimos.

1965 — NASA's Mariner 4 sends back 22 photos of Mars, the world's first close-up photos of a planet beyond Earth.

1976 — Viking 1 and 2 make the first, and still one of the few, successful landings on the surface of Mars.

1997 — Mars Pathfinder lands and dispatches Sojourner, the first wheeled rover to explore the surface of another planet.

2004 — Twin Mars Exploration Rovers named Spirit and Opportunity land on Mars and find the strongest evidence yet obtained that the red planet once had long-standing bodies of water.

ABOUT THE IMAGES



1 A large water ice cloud hangs over Olympus Mons (upper left in the image).

2 Gullies may be a sign that water has recently flowed on Mars.

3 Sphere-like grains that once may have formed in water appear blue in this false-color image taken by Mars rover Opportunity near its landing site.

4 False color (blue) shows where water ice is buried beneath the martian surface in this Mars Odyssey image.

5 A view of "Endurance Crater," near where Mars rover Opportunity landed in Meridiani Planum.

6 Mars rover Spirit uses its robotic arm to examine a rock named "Adirondack."

7 Mars rover Spirit photographed its empty landing platform after it rolled onto the surface of Mars at Gusev Crater.

FOR MORE INFORMATION

solarsystem.nasa.gov/planets/profile.cfm?Object=Mars