



Make that Mars Attracts. Certainly no other planet has attracted so much attention in recent history. Since it was first observed telescopically, Mars has been a brain boggler.

The polar ice caps froze and melted with the seasons. Did this mean there was water on Mars? Dark areas grew and changed shape as though they were strewn with wild plants and foliage. Could water be the reason for their growth? Were there living inhabitants of Mars who harvested what appeared to be growing there? There was speculation that the Martians had constructed an aqua duct system to water their crops.

## Quick Smarts

**Distance from Earth – 54.6 million km**

**Distance from Sun – 228 million km**

**Diameter - 6,780 km**

**Length of day – 24hr 40min**

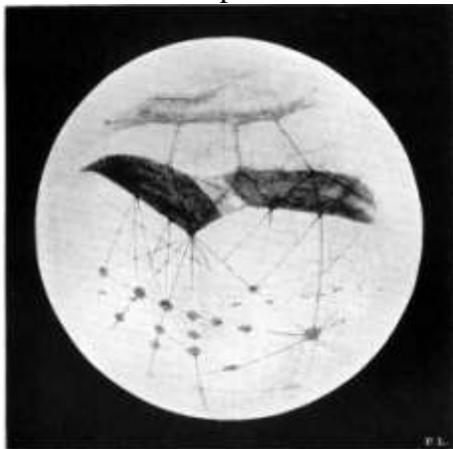
**Orbital period – 687 Earth days**

**Moons – Phobos & Demos**

**Atmosphere – 97% Carbon dioxide**

**Radio contact time – 4min to 20min\***

**\*Depends on distance between Earth & Mars.**



*Giovanni Schiaparelli's rendering of canali.*

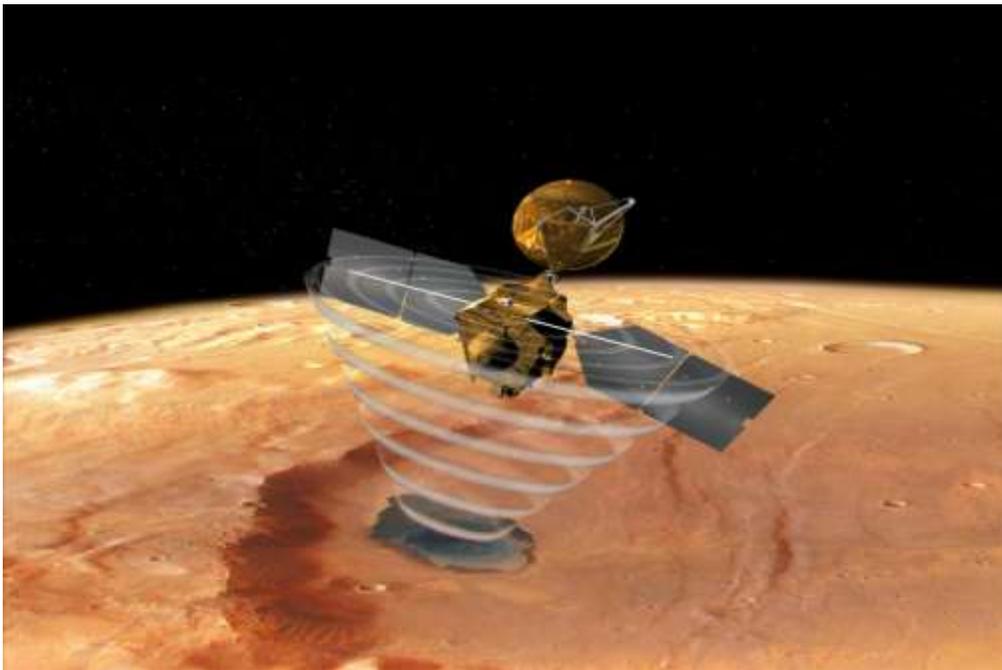


*A recent image of Mars from space. Courtesy NASA.*

Enter Percival Lowell, a wealthy gentleman with a great interest in science – especially astronomy. When he heard that Italian astronomer Giovanni Schiaparelli had seen “canali” on Mars, Lowell was quick to begin searching for more proof at his observatory. Unfortunately canali didn’t mean canals in Italian. It meant channels, close but not quite canals. So you can chalk all the excitement up to a linguistic boner that no one ever set straight. Even Schiaparelli never let out a peep.

There were a couple of things that Lowell and his contemporaries couldn’t know. The Polar Caps on Mars did shrink during the Martian summer. But the ice didn’t have a chance to turn into streams of water. Instead it sublimated straight into Mars’ atmosphere.

What were the dark areas? Earth-bound astronomers thought they changed size due to vegetation growth. What they didn’t know was that Mars has huge dust storms that cover large regions of the planet for days. Hence the shifting, drifting dark areas.



*Mars Orbiter surveys Mars for water hidden beneath its surface. Image Courtesy NASA.*

Today there is a fleet of orbiters recording data from above Mars. The European Space Agency (ESA) has Mars Express orbiting the Red Planet. ESA is a group of nations that share the cost of missions which are beyond the reach of many single nations.

India recently scored big as the first Asian country to successfully put a spacecraft into orbit around Mars. The official name is MOM for Mars Orbiter Mission.

NASA’s currently active spacecraft include the Mars Odyssey Orbiter, the Mars Reconnaissance Orbiter and MAVEN. But all the action isn’t in the air.

On the ground another set of explorers are imaging, scraping, drilling and blasting samples off rocks with a laser gun. They’re the rovers that NASA has landed successfully. During their tours of duty on the Red Planet the rovers have discovered positive evidence of ancient rivers and dried up lake beds. The Mars Polar Lander actually discovered water-ice when it reached out its digging tool and scraped away the

surface soil. Today most astronomers and scientists agree that Mars was once a watery planet. Where there's water there might still be life!



*The rovers grow bigger and more sophisticated. Left to Right: Sojourner, Opportunity and Curiosity Staged image by NASA.*

Curiosity is sending home stunning photos of Martian landscapes for the public and scientists. Using specially designed tools it gathers and analyses mineral samples. It images rocks in different wavelengths of light to identify their contents. As it travels from point to point, Curiosity monitors the Martian atmosphere and temperature. Curiosity can also cover more territory faster than any previous rover. Both Opportunity and Curiosity are running and communicating with us on a daily basis.

So what's it like on Mars? Cold describes it best, no matter what the season. Things change dramatically at the equator during the Martian summer. A daytime temperature of 20 °C isn't unusual. But bundle up come nightfall. The temperature drops to -70 °C. The reason is the fact that Mars' atmosphere is so thin it can't hold heat in.

Mars is about half the size of Earth and only 10% of Earth's mass. All told you'd weigh about 38% less on Mars. Goodbye Weight Watchers! Hello Dairy Queen! Unfortunately Mars' size and low mass are the reasons for its challenging environment.

From all the current evidence, Mars was once a warmer place with plentiful water. But it didn't have enough mass to hold on to its atmosphere. So the solar wind gradually blew it away into space. The thin atmosphere that remained couldn't shield the planet from solar and cosmic radiation.

Mars' size also caused it to cool rapidly. The hot core that still feeds volcanoes on Earth gradually diminished. This created two problems at the same time – a cold planet plus one with no magnetic poles.

Without a spinning core to act as a dynamo generating a magnetosphere such as we have on Earth, blasts of solar radiation aren't deflected from the planet's surface. The end result for you would be freezing to death while being fried by radiation. And did I mention breathing? The Martian atmosphere is just 1% as thick as that of Earth.

Rover/Earth communication is accomplished via NASA's Deep Space Network (DSN). The system involves three antennas placed at 120-degree intervals around the Earth. This allows communications between Earth and Mars or orbiting spacecraft no matter what the time of day. The network also has two spacecraft orbiting Mars to relay data back to Earth.

At the moment the future looks bright for Earth to invade Mars. NASA is planning for a Mars mission in 2030 with an intermediate step involving landing on Mars' tiny moon Phobos. NASA astronaut Buzz Aldrin is promoting the colonization of Mars as a way for the United States to assert its leadership in space exploration. NASA is testing its new mega booster rockets for the Space Launch System and has begun tests on its Orion spacecraft. These multi-crewmember space ships are designed to handle up to 7 astronauts on missions to the Moon, asteroids and beyond to Mars.

There's also Mars 1, an independently funded series of missions to the Red Planet to build a colony. It's a stretch of the imagination to assume that we have all the technology we will need on Mars. Plus there are other considerations, like living in isolation with 4 other "cell mates" for a couple of years? Geez Bob, you should have brought some more soap!

The challenge is there...and with it the excitement of discovery.



*The publically-funded Mars 1 colony might be our first community on another world. Given enough time it might even be possible to say "I married a Martian" and have it be true?*