

Mars – the planet most like Earth

Possibilities for life at Mars have given origin to many ideas about humans like Martians, inhabitant that have built artificial water supply channels to lead water from the polar areas to areas near the planet's equator, known as Schiaparelli's channels. Many were, and in some cases still are, stories about a visit of Martians, of different imaginative looks, and with both peaceful and hostile intentions. The ideas about life and vigorous vegetation at Mars were definitively put to rest after the Mariner 6 and 7 and the Viking landers returned pictures that showed a very sterile landscape, free of all types of life we know from earth. However, in spite of possibilities to find life similarly to that on earth is minimal, seeking for one or another form for life at Mars is still one of the main objectives for all of the missions to Mars. Another large question is how a planet, that previously obviously had free water, has become so cold and inhospitable as it is now.

Mars is one of the inner planets, fairly like earth, but very unlike the very large outer planets Jupiter and Saturn. The inner planets are from the sun and out Mercury, Venus, Earth and Mars. Of these, earth is the largest and the only one known to life at, but the conditions give hope to find it both at Mars and Venus.

Dramatic landscape.

Although Mars is a small planet – its radius is just a little over half of the earth's – we know it boasts of scenery on a scale that makes Mount Everest and the Grand Canyon seem unimpressive by comparison. As the highest volcano in the solar systems, Olympus Mons which raises 25 km above the surrounding plain: Mount Everest is only one third as high. Olympus Mons lies at the western edge of another gargantuan feature, the Tharsis dome, which is a 10 km high, 4000 km wide bulge in the Martian surface.

Running from the eastern flanks of the rise, roughly along the equator, is Valles Marineris, a split in the Martian crust 4000 km long (about a fifth of the Martian circumference) up to 600 km wide and 7 km deep. The Grand Canyon is a mere 450 km long, up to 29 km wide and 1.6 km deep.

Then there is the Hellas Basin in the southern hemisphere, which is an enormous impact crater 2300 km in diameter and more than 9 km deep. But perhaps most striking of all is the general difference in height and surface roughness between the northern and southern hemispheres. The northern hemisphere is flat and young and on average 6 km lower than the

Mars has always been the most interesting celestial body for us at earth. Through well known astronomers such as Tycho Brahe, Johannes Kepler, Galileo Galilei, Christian Huygens, G. Domenico Cassini, William Herschel, Giovanni Schiaparelli and Euclyde Antoniadi, we have gradually extended our knowledge about the planet. But in all respect for the previous astronomers, the space ages with satellites and landers, the past four decades have given us more detailed information about the planet than several hundred years of research have before.

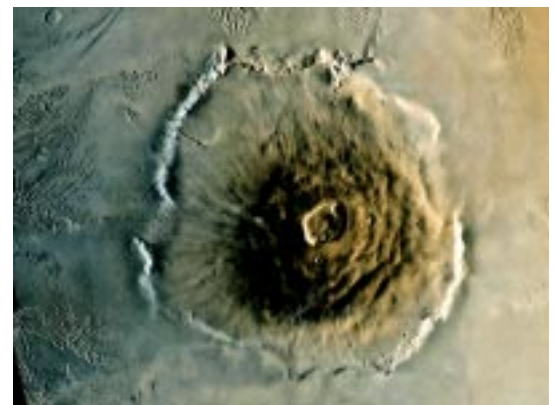
rugged older highlands of the south.

Water and life.

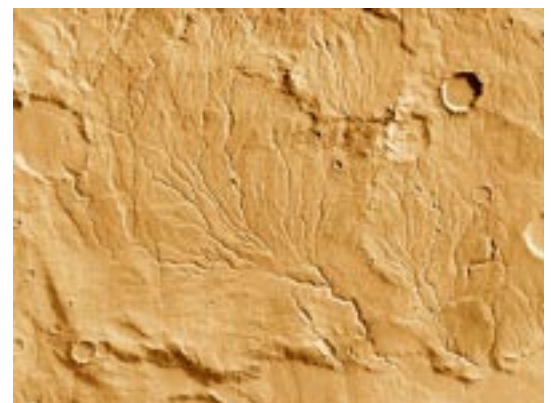
Three decades of space exploration have also revealed that Mars is a cold, dry place with thin atmosphere, consisting mainly of carbon dioxide. There's evidence, though that conditions were very different early in the planet's history (3.8 billion years ago). Mars may once have been warm and wet.

If liquid water did flow on early Mars, could life have evolved there? The more we know about life on Earth, the more likely it seems that life could exist elsewhere. In recent years, microorganisms have turned up in the most inhospitable niches on earth, where nobody previously thought anything could survive.

An energy source and water seem to be the only two essential prerequisites for life common to these niches. Water may once have flowed freely on Mars and, like earth; the planet receives sunlight and has its own internal energy source. So the odds on primitive life thriving for at least some time during the planet's history are reasonably good.



Olympus Mons, with its 25 km high, it is the highest volcano in the solar system. Mount Everest is only 8 km high. Photo: ESA.



Valley networks suggest that rivers once flowed on Mars. Photo: ESA.