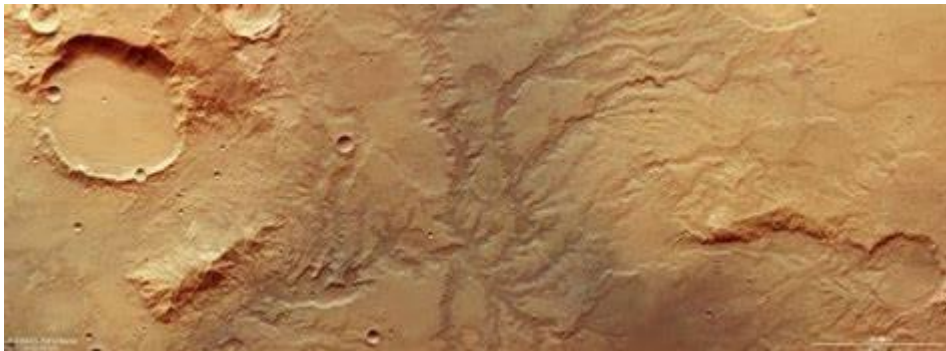


FINDING A LOST MARTIAN OCEAN

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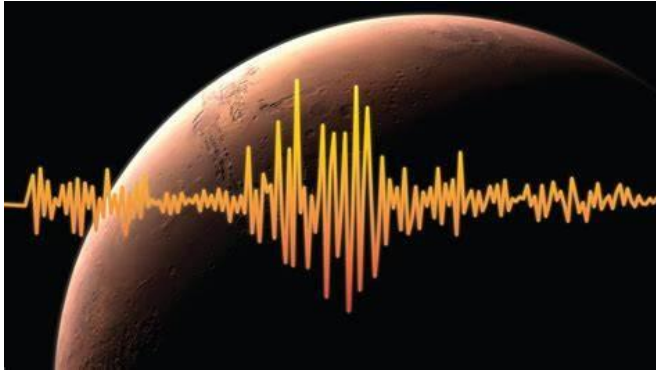
When our spacecraft sent back the first high quality images of the surface of the red planet, they showed a red, frigid desert. However, they also showed that Mars had not always been like that. Everywhere there were dried watercourses, river deltas and dry lakes. There is also a huge water-eroded canyon. Billions of years ago Mars was a warm, wet world with a thick atmosphere, just like our planet. Then things changed, and that world turned into a cold, arid desert.



We think the atmosphere disappeared because the planet's metallic core solidified, causing its magnetic field to decay. This allowed the solar wind to scrub away the atmosphere. Our planet's magnetic field is strong and keeps the solar wind well away. Could the solar wind have scrubbed away the Martian water too? However, there was probably far too much of it for it all to be lost in this way, so where did all the water go?

There was a large amount of it on the surface when the planet was young. On our planet water made life possible and sustains it today. Did the story of life on Mars get started and then end? There is evidence of traces of water on the surface today and some ice at the poles, occasional short-lived flows of liquid water on the sides of gullies, and some frost on the rocks visible in the dawn sunlight. Landers have scraped the sandy surface away, showing ice. However, until very recently we had found no evidence of enough water to fill an ocean, or even a large lake. Now it could be that the missing water has been found, buried many kilometres below the surface. It was detected using marsquakes. One of the landers sent to Mars carried a seismometer on board. This was intended to tell us about the internal structure of the planet. These instruments revealed to us the internal structure of our world.



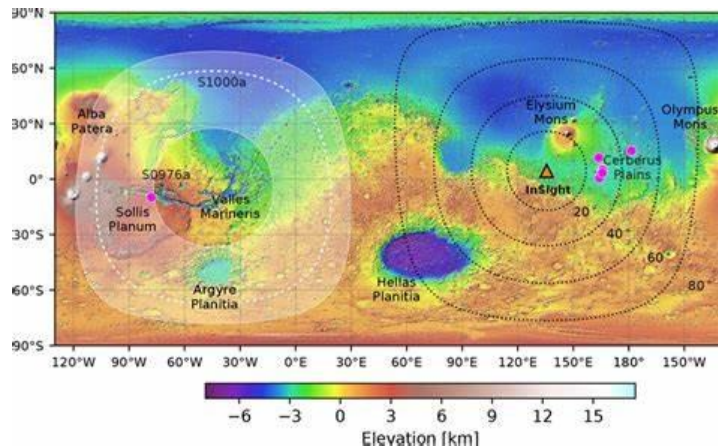


Earthquakes produce different types of waves, such as pressure (push and pull) waves and transverse (shake) waves. How they propagate through the body of a planet depends on the medium through which they are passing. For instance, pressure waves pass through liquid rock, but shake waves have a lot more trouble. So, we monitor the earthquakes all over our world and see what sorts of waves

arrive at our seismometers. This is how we know about the Earth's inner and outer core, the mantle, and on top, the crust.

Mars is not as geologically active as our world, but because of its position at the edge of the asteroid belt, and with an atmosphere less effective at burning up cosmic intruders, there are more meteorite impacts. These launch waves similar to those caused by quakes. The seismometer detected something really surprising, evidence of a huge amount of water in the rocks kilometres underground, enough to fill an ocean. This is not just intriguing; it opens a possibility for Martian life.

Here on Earth, we have found microscopic creatures living in water-filled cracks in the rocks, deep underground. These creatures get their warmth from our planet's core. They have no need for solar heat. That underground layer of rocks containing an ocean of water deep below the surface of Mars could be suitable for similar forms of life. As in the case of Earth, they could be basking in the warmth from the Red Planet's core, protected from the hostile environment now existing on the surface of the planet.



Here on Earth, we have found living things in almost-boiling volcanic springs, in water so acid it would burn our skins. If life got started on Mars, billions of years ago, then even today, on a planet with a thin atmosphere and the surface that is a frigid desert, life may have survived.

Around midnight, Saturn lies low in the south, and Jupiter and Mars close together in the northeast. The Moon will reach Last Quarter on the 24th.

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