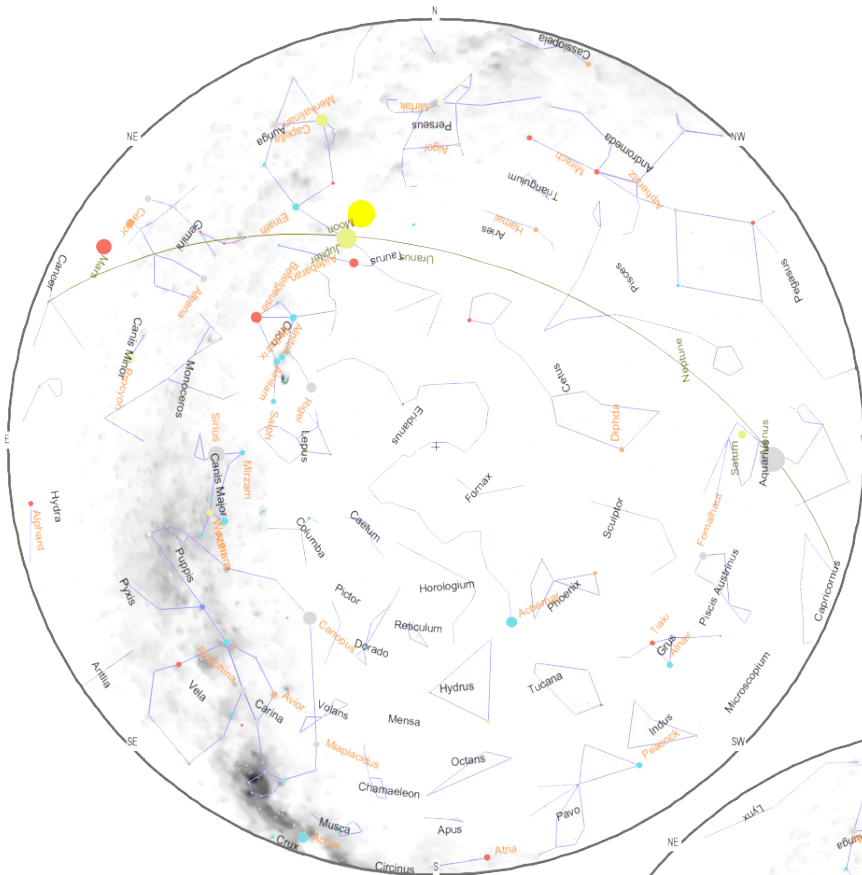


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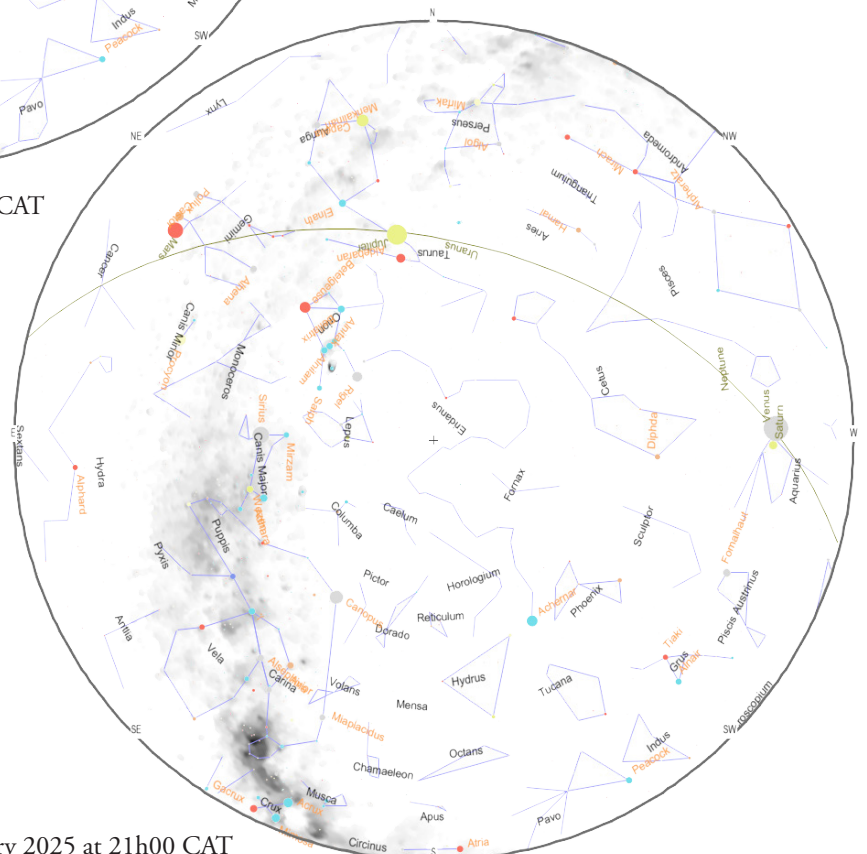
P.O. Box 67, Windhoek, Namibia • Tel.: +264-(0)61-225 372
email: info@namscience.com • www.namscience.com
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Astronews January 2025

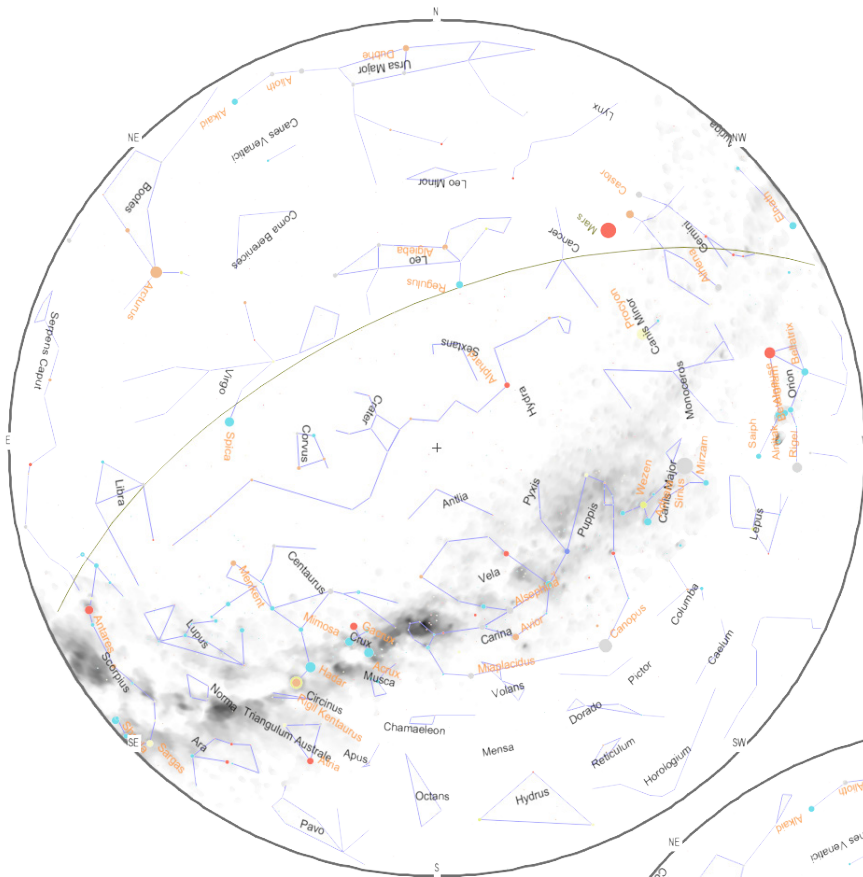
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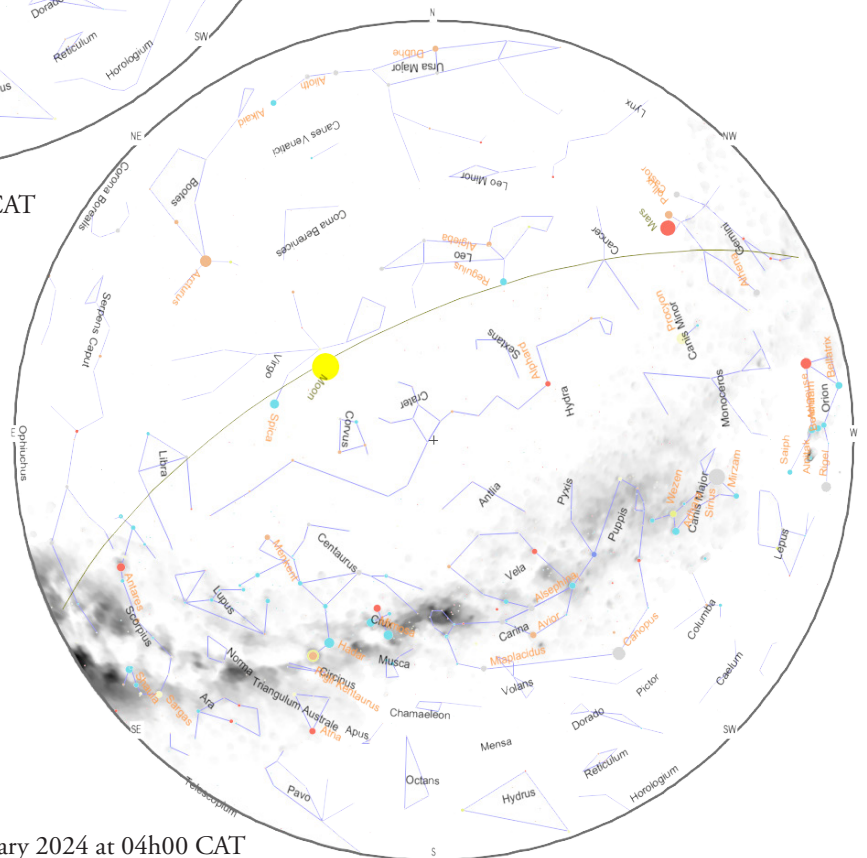
Skychart at Windhoek on 10 January 2025 at 21h00 CAT



Skychart at Windhoek on 20 January 2025 at 21h00 CAT



Skychart at Windhoek on 10 January 2024 at 04h00 CAT



Skychart at Windhoek on 20 January 2024 at 04h00 CAT

Moon Phases

31 Dec 2024	New Moon
07 Jan 2025	First Quarter
14 Jan 2025	Full Moon
21 Dec 2025	Last Quarter

Solar System

Planet Visibility	Rise	Culm.	Set
15 Jan 2024			
Mercury	04:34	11:16	17:58
Venus	03:47	10:28	17:08
Mars	05:01	11:46	18:31
Jupiter	13:46	19:27	01:09
Saturn	09:18	15:40	22:02

Mercury remains just about visible as a morning object, now well past its greatest elongation west and returning closer to the Sun. It is visible in the dawn sky, rising at 04:39 and reaching an altitude of 13° above the eastern horizon before fading from view as dawn breaks.

Venus is emerging into the evening sky as it approaches its greatest elongation east. Venus will become visible at around 19:54, 34° above the western horizon. It will then set after the Sun at 22:30.

Mars is currently approaching opposition. Mars is becoming visible around 21:50. It will reach its highest point in the sky at 02:30, 43° above your northern horizon. See Planet of the Month by Simon van der Lingen below.

Jupiter is currently an early evening object, now receding into evening twilight. In Namibia, it will become visible at around 20h00 set at 01h00.

Saturn will soon pass behind the Sun at solar conjunction. In Namibia it will become

visible after sunset as dusk fades to darkness 23° above your western horizon, setting two and a half hours after the Sun.

Other Occurrences

The Earth at perihelion on Saturday, 4 January: The Earth's annual orbit around the solar system will carry it to its closest point to the Sun, at a distance of 0.9833 AU. The

average distance is 1 AU and the maximum distance is 1.0167. Measured in Kilometers 1 AU equals 149,597,870.70km.

The Earth's distance from the Sun varies by around 3% over the course of the year because its orbit is slightly oval-shaped, following a path called an ellipse. In practice, this variation is rather slight, however, because the Earth's orbit is very nearly circu-

lar. The sun is also not at the exact centre of the said ellipse.

The Earth completes one revolution around this oval-shaped orbit each year, and so it makes its closest approach to the Sun on roughly the same day every year. In 2025, this falls on 4 January.

Mars

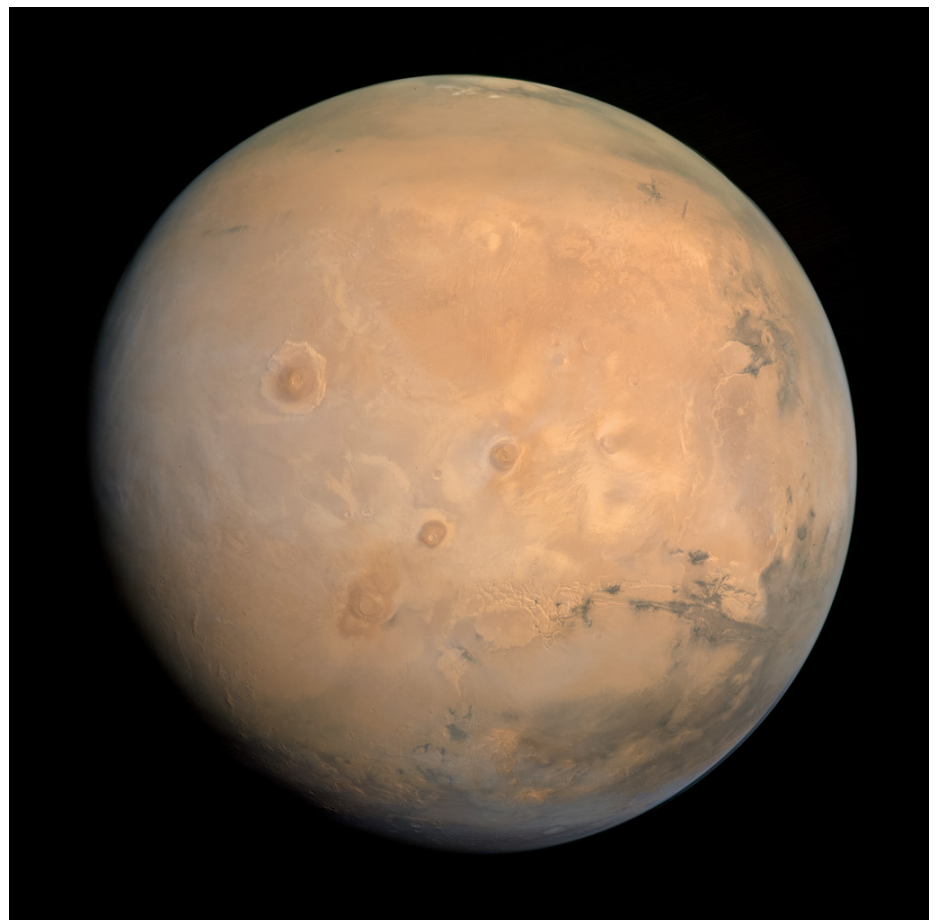
Planet of the Month

by Simon van der Lingen

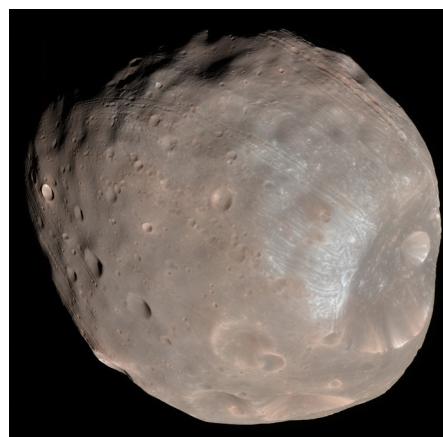
In early December, the distance between Jupiter and Earth was minimised because their orbits around the Sun briefly synchronised (termed an Opposition), giving us a great opportunity for telescope observation of Jupiter. On January 6th, it will be Mars's turn to shine. However, because of the elliptical nature of all orbits, not all Oppositions are created equal and during this one, Earth will be nearer to its closest point to the Sun, while Mars will be almost at its furthest. During the 2018 Opposition, the distance between the two planets was about 57.6 million km; in January 2025, they will be 101 million km apart. Nevertheless, the evening will give us the best view of this fascinating planet for a year, so we should definitely take advantage of it.

Mars is a small, rocky planet (only 15% of the mass of Earth) whose formation was interrupted by the inward, then outward migration of Jupiter during the earliest years of the Solar System. Mars has two very small moons, Phobos and Deimos. Deimos will gradually drift away, while the other, closer and more firmly gripped by the tiny planet's gravity, will one day fall to its surface. A good telescope on a clear, dark night will show a surprising amount of geographic detail. Look for the polar caps of frozen carbon dioxide, the snowy summit of Olympus Mons rising 22km above the plains and dark stains of basalt plains amongst the rust-red regolith that covers much of the Martian surface.

Mars is the most thoroughly explored of all the planets. The entire Martian surface has been mapped in detail, while only 98% of the Earth's surface (excluding the ocean floor) has been surveyed. Wikipedia lists 47 missions to Mars from Russia, the USA, China, the European Space Agency, India and the United Arab Emirates.



Mars

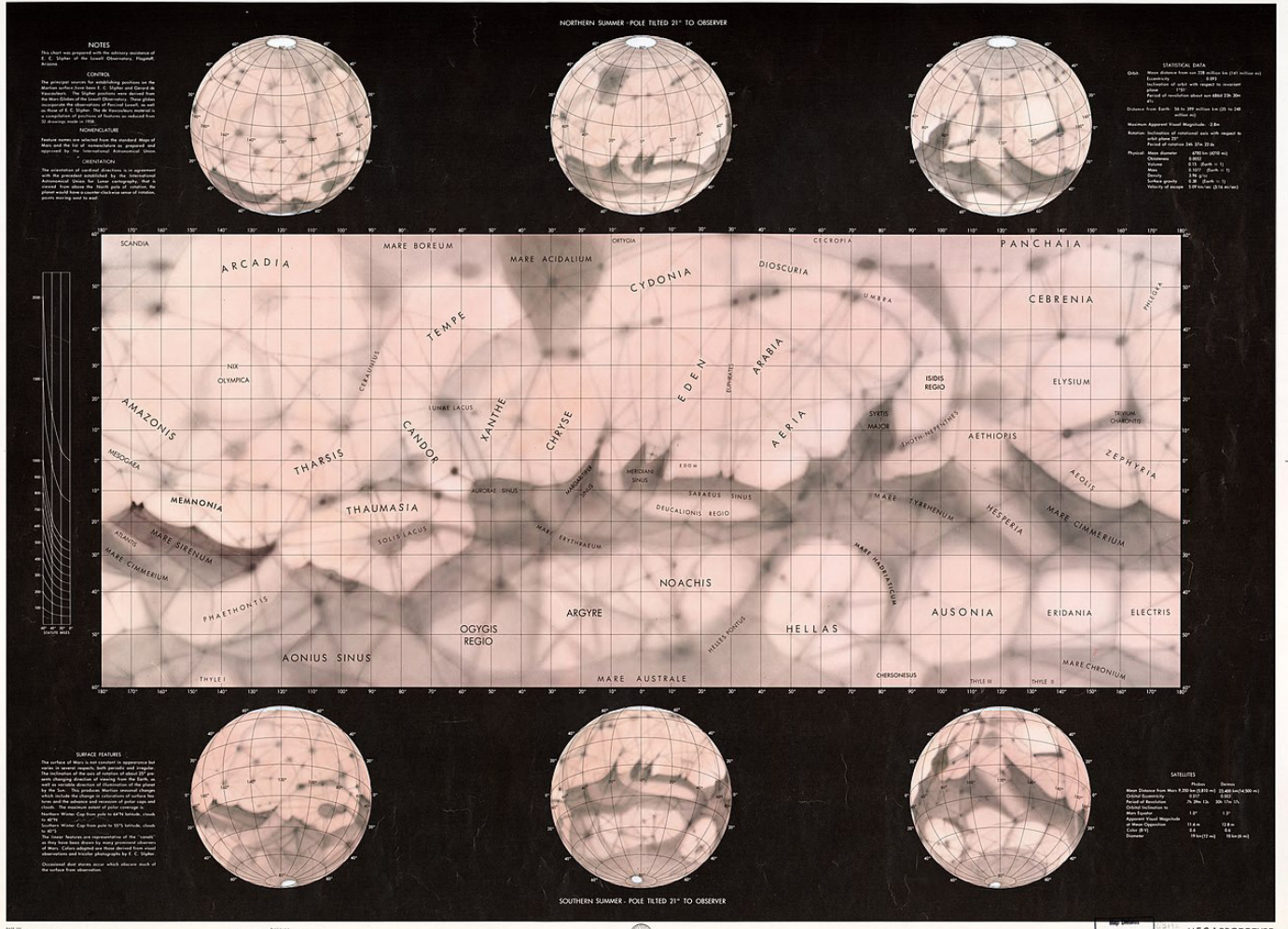


Phobos



Deimos

MARS



This modern fascination with Mars likely began with Italian astronomer Giovanni Schiaparelli who took advantage of the Great Opposition of 1877 to test a new 10-inch telescope donated by the King of Milan. During his observations, Schiaparelli was able to make out dark areas amongst the more generalised red regions. He theorised that the dark areas were shallow seas, connected by a network of narrow, shallow channels and published his results, including maps, in a paper titled *Conti della Mars*. In due course, the paper was translated and widely distributed, eventually reaching the attention of American entrepreneur, mathematician and amateur astronomer Percival Lowell. Lowell read the paper with considerable interest, not realising that the “canali” (meaning channels) had been mistranslated as “canals”, which implied an artificial rather than natural phenomenon. Excited by the implications of what he had read, and wealthy enough to take resolute action, in 1894 Lowell founded the Lowell Observatory in Flagstaff, Arizona. For the next 15 years, Lowell spent a considerable amount of his time studying Mars at the observatory. Unsurprisingly, he saw the same lines as Schiaparelli, and, convinced

they were artificial rather than natural, also saw city lights at the intersection of some of the canals. He theorised that Mars was inhabited by a technologically advanced race which, threatened by a drying planet, had constructed canals to tap melt water from the Polar Caps, and published his opinion in a series of three books. Although we now know that the “canals” are an optical illusion, his ideas tapped into popular sentiment and ignited public imagination to the extent that he was able to convince the good citizens of Flagstaff, San Francisco and Los Angeles to signal Mars by dimming their lights in a kind of Morse Code for Martians. Although other astronomers were sceptical about Lowell’s theories and even about the existence of surface water on Mars, the general public was wholeheartedly supportive. Other more sceptical observatories saw only a few features which matched Lowell’s descriptions, but the matter was really only decided in 1964 when Mariner 4 flyby recorded a landscape much more reminiscent of the Moon.

The Mariner missions revealed a barren, waterless landscape, but subsequent missions found minerals that could only have

formed in the presence of water, and ancient landscapes that looked very like dry waterbeds, lakes and even seas.

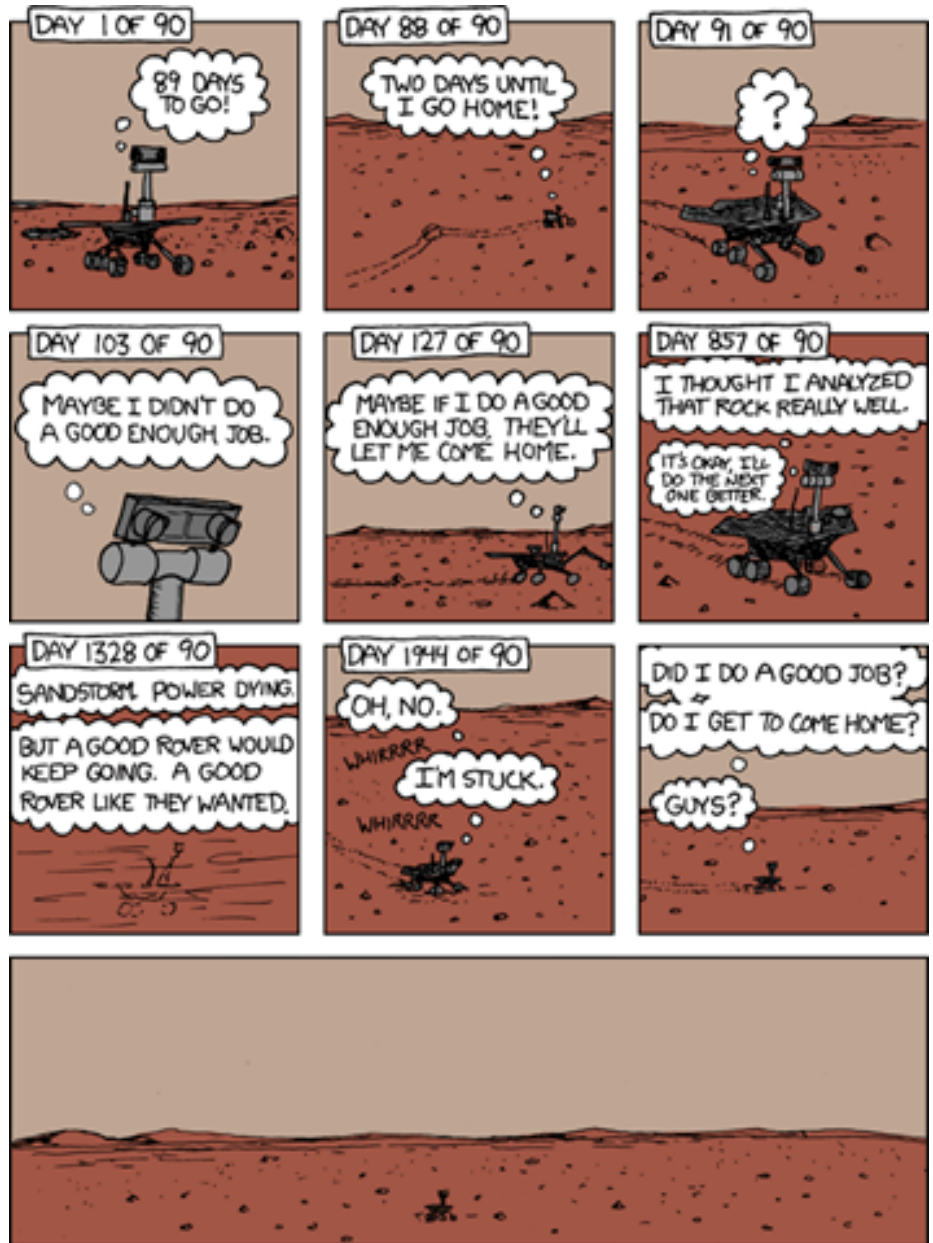
A series of orbiters, landers and rovers have gradually pieced together a tentative geological history of Mars. About 4 billion years ago, the Martian core cooled and solidified and the planet’s magnetic field faded. Without its protection, Mars’ atmosphere was slowly stripped away by the Solar Wind, and all surface water evaporated under the much lower pressure, to be lost into space. For three billion years, Mars has been a cold, dry desert. More recent surveys have, however, revealed considerable bodies of subsurface water, particularly around the poles.

It seems Mars was warmer and wetter at about the same time that biological activity began on Earth and it is at least conceivable that the same process occurred on Mars. We know that life started very early on Earth and that life, especially the more primitive organisms, is remarkably tough. While Lowell’s vision of an advanced civilisation pumping water from the poles is just a fable, the search for traces of Martian life

has provided a series of tantalising hints. A meteorite originating from Mars and found in Antarctica in 1984 bore microscopic structures looking very like bacterial fossils; other researchers proposed that they were mineralogical in origin rather than biotic. Experiments by two Viking Landers in 1976 irrigated soil samples with warm broth, and in some cases detected what appeared to be traces of metabolic activity. Other scientists argued that the presence of unexpected chemicals in the soil may possibly have yielded similar results. More recent work suggests that the amount of water provided may have drowned any arid-adapted life. Faint traces of atmospheric methane detected every summer since 2004 may be entirely geological in origin, or maybe ancient reserves of biogenic methane released by a summer thaw, or may perhaps be metabolic products produced by normally dormant organisms thawing and returning to life during brief spells of warmer weather. Frustrated by the inconclusive answers, scientists have instructed the current Mars Rover to collect and cache samples of rock and soil from hopeful sites, with a view to launching them into orbit later, where they would be scooped up and returned to Earth by a special mission. Several samples have been collected, but work on the sample-return system has been put on the back burner due to financial constraints.

No discussion of Mars would be complete without mentioning Elon Musk's plans to terraform and colonise the planet as a kind of Plan B and as a first step towards colonising other star systems. Musk's ambitious vision is to transport one million people to Mars in batches of 100 over the next century. He is reportedly offering loans to help people who can't afford the projected USD200,000 one-way ticket, as well as offering his personal genetic contribution to ensure that children born on Mars will have at least one smart parent.

Spirit Rover landed on Mars in 2004 to undertake a mission planned to last 90 days. The mission was extended to last over six years, producing good evidence of the planet's much wetter past.



Credits

SkyChart: Cartes du Ciel / Wikipedia
 Data: <https://in-the-sky.org/> / ASSA Sky Guide 2025
 Pictures: Wikipedia