# NAMIBIA Scientific Society Wissenschaftliche Gesellschaft

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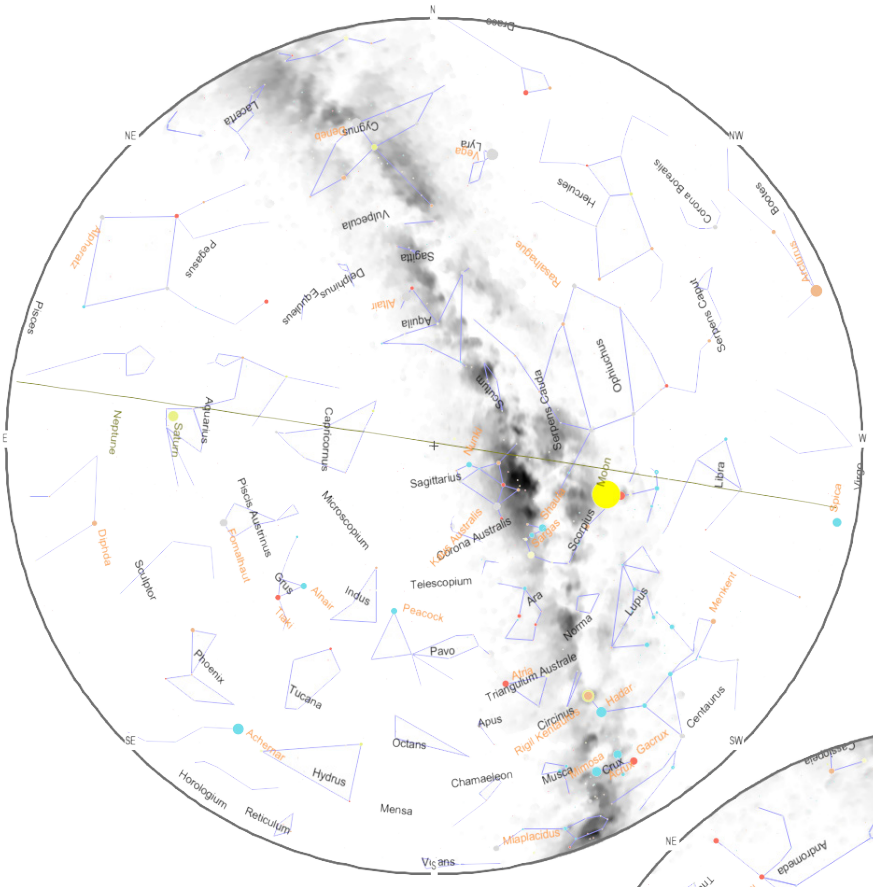
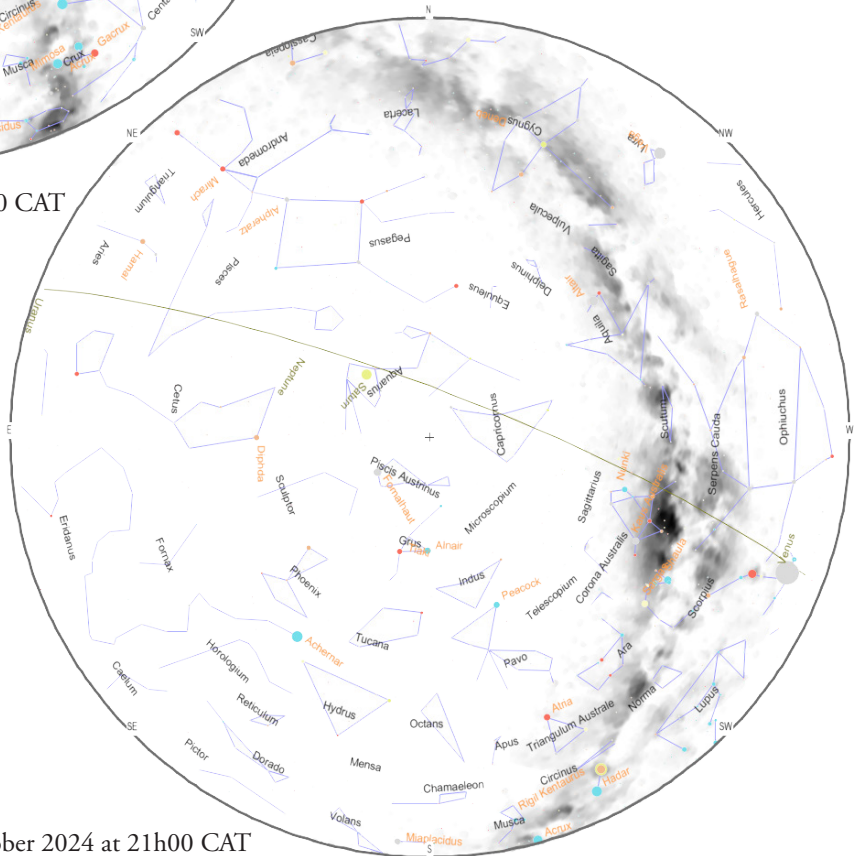
## Astronews October 2024

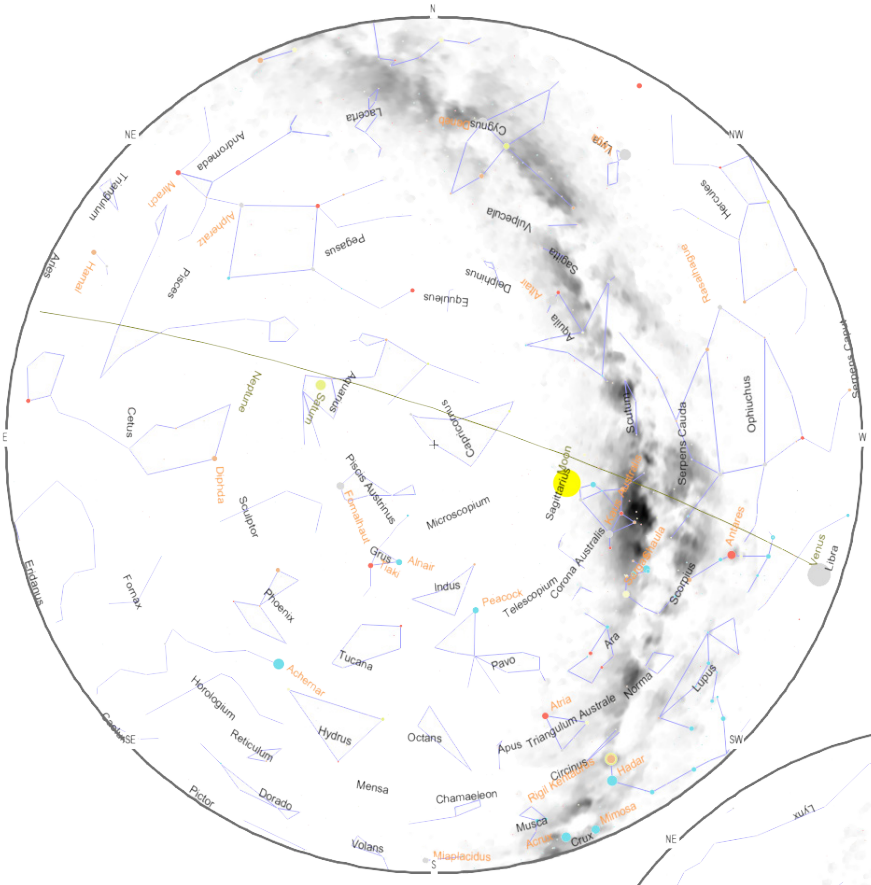




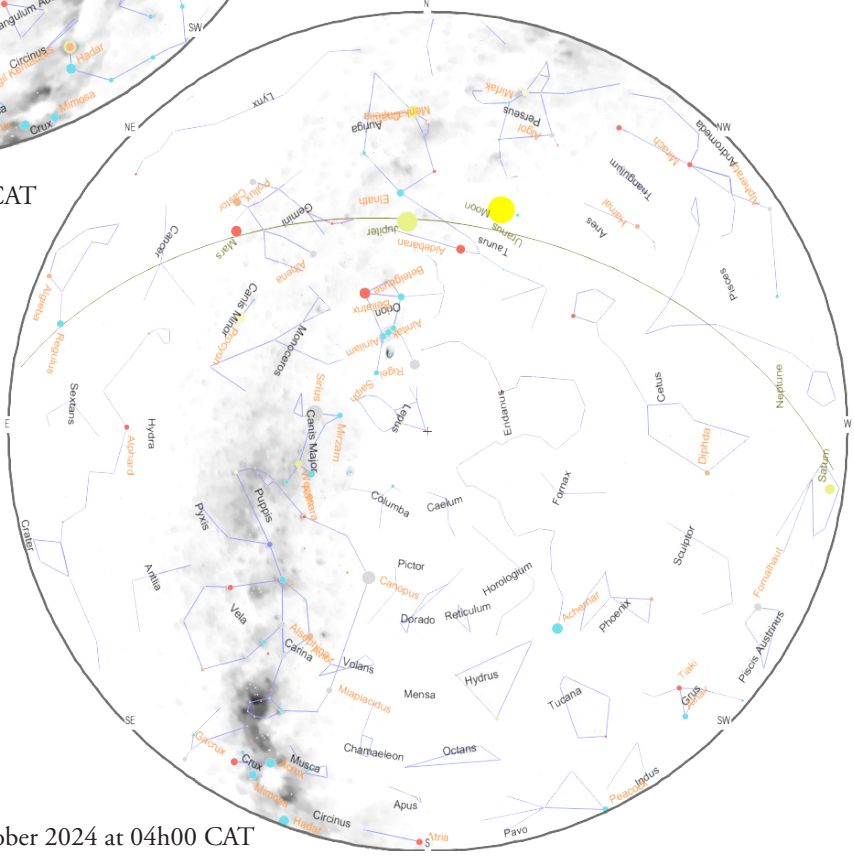

Skychart at Windhoek on 10 October 2024 at 21h00 CAT




Skychart at Windhoek on 20 October 2024 at 21h00 CAT




Skychart at Windhoek on 10 October 2024 at 04h00 CAT




Skychart at Windhoek on 20 October 2024 at 04h00 CAT

**Moon Phases**

| | |
|---|---|
| 02 Oct 2024 | New Moon |
| 10 Oct 2024 | First Quarter |
| 17 Oct 2024 | Full Moon |
| 24 Oct 2024 | Last Quarter |

**Solar System**

| Planet Visibility | Rise | Culm. | Set |
|---|---|---|---|
| 15 Oct 2024 | | | |
| Mercury | 06:47 | 13:10 | 19:33 |
| Venus | 08:19 | 14:47 | 21:25 |
| Mars | 01:25 | 06:47 | 12:10 |
| Jupiter | 23:12 | 04:35 | 09:59 |
| Saturn | 15:56 | 22:13 | 04:30 |

Mercury is not observable since it just passed behind the Sun. It will become visible in the evening in November and reach its highest point in the sky on 15 November 2024.

Venus is currently a prominent feature of the evening sky becoming visible above the western horizon, as dusk fades to darkness. It will then sink towards the horizon, setting two and a half hours after the Sun.

Mars is still visible in the early morning sky, rising at 01:30 and reaching an altitude of 42° above the northern horizon. Also, read Life on Mars by Simon van der Lingen in the Months Astronews.

Jupiter now becomes. visible at around midnight. It will reach an altitude of 45° above the northeastern horizon.

Saturn passed opposition becoming visible at around 19:30 above the eastern horizon. It will reach its highest point in the sky at 22:00.

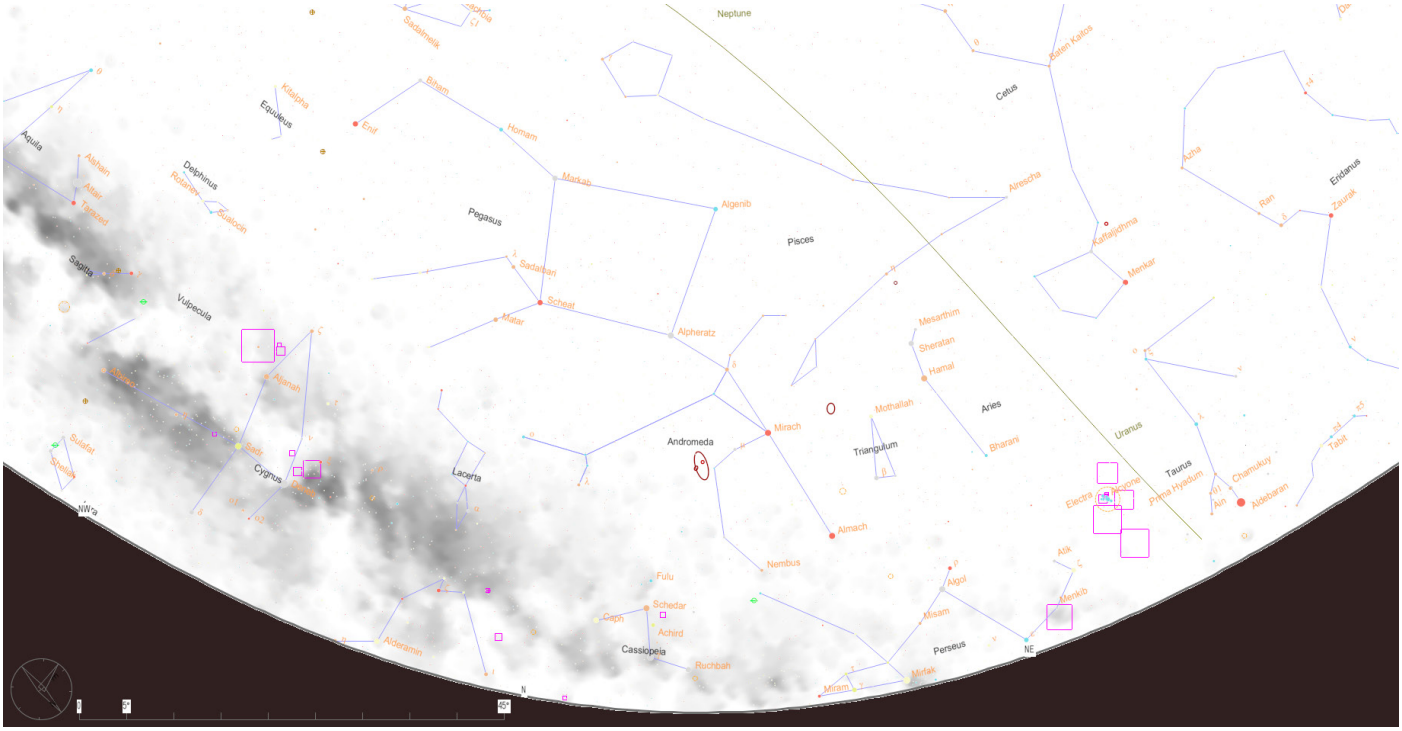
**Other Occurrences**

Full Moon on 17 October

The third of 4 supermoons in a row for 2024. The distance from Earth will be 357,179 km.

Before sunrise, you can observe Crux and the pointer stars rising in the south-east with Canopus and Achernar setting in the south-west.

The Comet C/2023 A3 (Tsuchinshan-ATLAS) could become visible from about 19h55 evening sky in the constellation of Ophiuchus from 22 October with an approximate magnitude of 4.9.

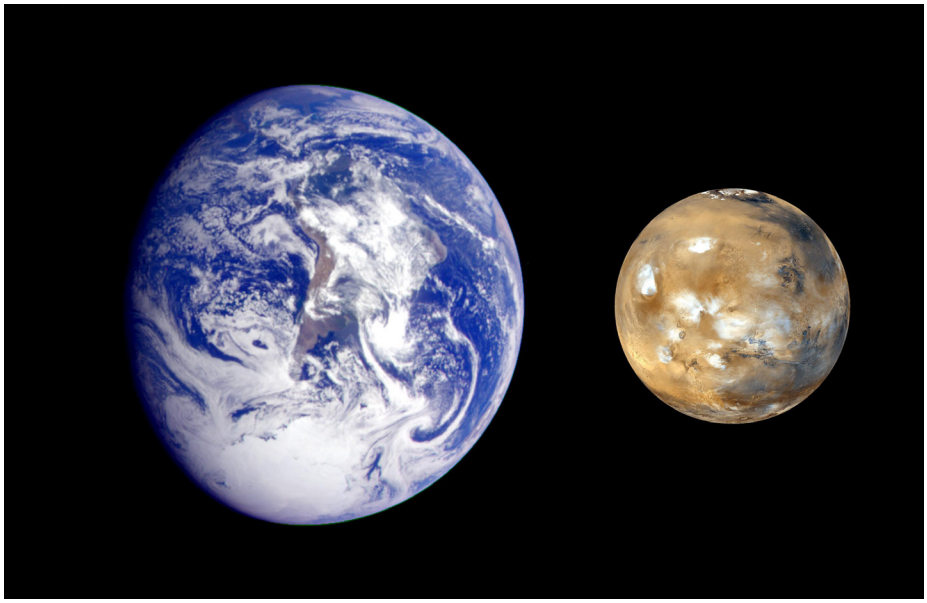



## Life on Mars?

*by Simon van der Lingen*

"Two possibilities exist: either we are alone in the Universe, or we are not. Both are equally terrifying." Arthur C. Clarke, 1960.

Professor William Walsh delivered a fascinating presentation to Namibia Scientific Society members on 25th July 2024 about our search for extra-terrestrial life in the Universe. He focused on four reasons why the probability of extra-terrestrial life has increased dramatically over the past few decades – the astonishing speed at which life first appeared on Earth, the spectacularly wide range of environmental conditions in which life could thrive, the widespread existence of planets around stars, and finally the possibility of life outside the Habitable Zone of a planetary system where water might exist in a liquid state. In particular, he highlighted the existence of "Icy Moons" around Jupiter and Saturn, where vast oceans exist, warmed by tectonic activity of a rocky core and capped by thick ice layers. Conditions at the core of each of the Icy Moons are expected to closely replicate conditions on a young Earth's oceans,



*A composite image, from NASA Galileo and Mars Global Survey orbiters, of Earth and Mars showing the relative sizes of the two planets*
*Credit: NASA and JPL*

where life on our planet is thought to have originated.

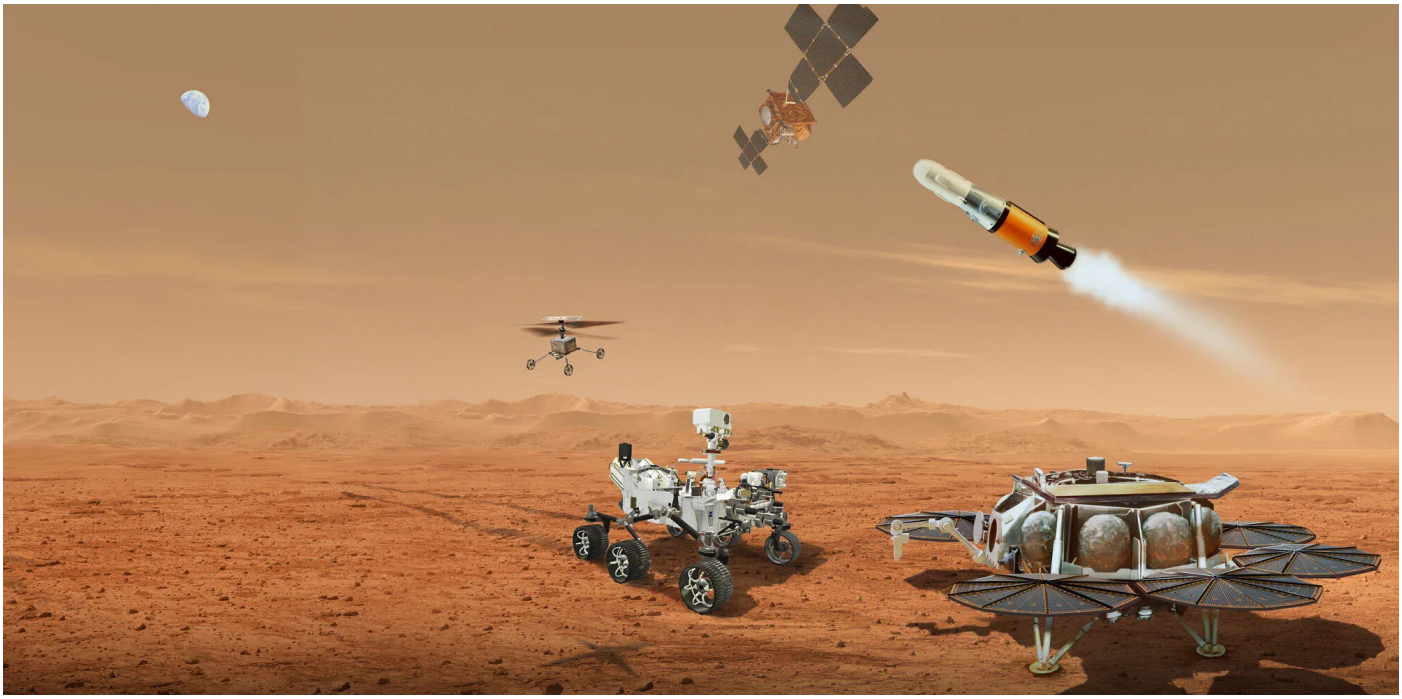
However, he was somewhat dismissive about the possibility of finding life on Mars, although the history of human exploration of the surface of Mars is replete with hints of the existence of life, past or present. There's big money being bet on the possibility as well. All of the Mars Rovers had goals linked to the search for life, but the most recent Perseverance Rover's goals are the most explicit: identify environments that are capable of supporting microbial life; search for biosignatures; and collect and caching samples of rock and regolith (Martian "soil") for later return to Earth for forensic examination.

While Percival Lowell's "discovery" of artificial canals, and possibly cities, on the surface of Mars in 1892 and Edgar Rice Burrough's Barsoom series (eleven novels published between 1911 and 1941, celebrating the romantic entanglement of Confederate soldier, John Carter and the beautiful Martian Princess, Dejah Thoris) were somewhat fanciful, there are a series of experiments and discoveries that are suggestive of life on Mars, either past or maybe even present.

In 1976, Viking 1 and Viking 2 Mars Landers collected samples of regolith, irrigated them with nutrient solutions, incubated them, and then searched for signs of metabolic activity. Some of the samples were unreactive, and some seemed to produce biosignatures, but the scientific argument over whether these were genuinely artefacts of life or due to the peculiar Martian chemistry endured for 40 years and the current consensus opinion is "inconclusive". In 2008, the Phoenix Lander confirmed the existence of perchlorate chemicals on Mars, strong oxidisers that might destroy organic molecules under Viking test conditions, tilting the conclusion ever-so-slightly towards the pro-life camp.

Methane is produced on Earth mainly by living organisms (think cows and bacteria), but is common in the outer solar system – Saturn's moon Titan has literal rivers and lakes of methane and ethane, but its detection on Mars in 1969 by the Mariner 7 flyby mission sparked interest which quickly died down after the realisation that the traces could also be attributed to more boring frozen CO2. Interest was reignited in 2012 when Curiosity Rover detected ground-level methane in Gale Crater. The European Space Agency's Mars Express Orbiter and a joint ESA/Roscosmos Trace Gas Orbiter also detected atmospheric methane. Currently, it seems that nobody knows where it comes from, nobody knows why it decays so quickly, or why it is so localised, but there seem to be three possibilities: it is formed by geological processes; it is exhaled by living organisms that wake up and metabolise when conditions are good; or it is leaking from underground reservoirs formed millions of years ago by now-extinct organisms, with a consensus cautiously edging to the last possibility.

Life, on Mars or anywhere else, is unlikely to exist without the availability of liquid water. Orbital photography and ground-based investigation reveal the existence of what seems to be water-sculpted landscapes – Perseverance Rover landed in Gale Crater precisely because it was thought to be an ancient lake bed. Layers of sedimentary rock formations on the edge of the crater, the existence of clay beds in the crater and the abundance of minerals that can only



have formed in the presence of water seem to confirm, beyond a reasonable doubt, that Mars once had surface lakes, rivers and seas. These would have evaporated once the atmosphere leaked away, but the more recent discovery of ice just under the Martian surface raises the possibility of organisms remaining dormant during the cold months, then springing briefly into life during the short melt periods. In 2018, scientists reported that ESA's Mars Express Orbiter detected what appeared to be large deposits of water about 1.5km below the Martian South Pole; just weeks ago, an examination of seismic data from NASA's Insight Lander confirmed the existence of huge deposits of water 10-20km underground. Admittedly, this is pretty deep, but about 70% of our own planet's microbial biomass lives underground. Samples have been collected from as deep as 5km beneath the surface, but it is thought possible that life exists at twice this depth. There may be little to no water on the Martian surface, but there appears to be plenty underground. In 2022, CNN reported that scientists testing six bacterial and fungal species found one, nicknamed Conan the Bacterium for its tough characteristics, could survive for hundreds of millions of years in Martian conditions if buried just 10m underground.

Perseverance Rover is collecting rock and soil samples from Gale Crater for eventual return to Earth, but the discovery of meteorite fragments from Mars is not uncommon. In 1996, microscopic examination of Martian meteorites collected from the Allan Hills Range in Antarctica revealed what appeared to be fossilised traces of bacteria, smaller but essentially similar to known terrestrial specimens. Again, the scientific community is split on the interpretation of the evidence – it might be aliens, it's possibly mineralogical. Similar controversy also attends to the recent discovery in Gale Crater of an iron sulphate mineral called jarosite, associated with microbial activity in sulphate-rich, acid environments on Earth.

So much smoke, but still no fire! Originally, the Mars Sample Return Mission was planned to deliver Perserverance's samples in 2033, but escalating costs and unexpected complexities have pushed this back to possibly 2040. Hold Your Breath!

**Credits**
SkyChart: Cartes du Ciel / Wikipedia
Data: https://in-the-sky.org / ASSA Sky Guide 2024
Pictures: Wikipedia, www.earth.com