

Every Region has its Mars and Capricorn

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2018 is a good Mars year for keen astronomers. From early July to late August the planet will shine with greater strength than bright Jupiter can manage. This event also enables us to familiarise ourselves with Capricorn, one of the faint constellations of the zodiac. Mars will remain between the stars of Capricorn until mid-November. Every region has its daily and annual rhythms and also "its own" zodiac, its planets and eclipses. The "celestial archetypal image" appears in many different guises.

The Colours of Peacefully Shining Mars

Mars is called the red planet because for most of the time it has a reddish appearance. In contrast to the stars, it does not twinkle; the planet shines with peaceful radiance. Its "muted brightness" is one of the characteristics that distinguishes it from Saturn. Mars and Saturn have in common that both at the start and the end of their visibility period they are inconspicuous for months in the starry heavens. Reddish Mars is then mostly fainter than yellowish Saturn.

In spring, Mars sets out to shine with greatest radiance throughout the night. As it grows brighter, its light takes on a different hue and turns orange. At the end of July it reaches its greatest radiance. In 2018 it becomes so bright that its light is yellowy orange in the clear dark night sky. No other planet displays as many colour nuances.

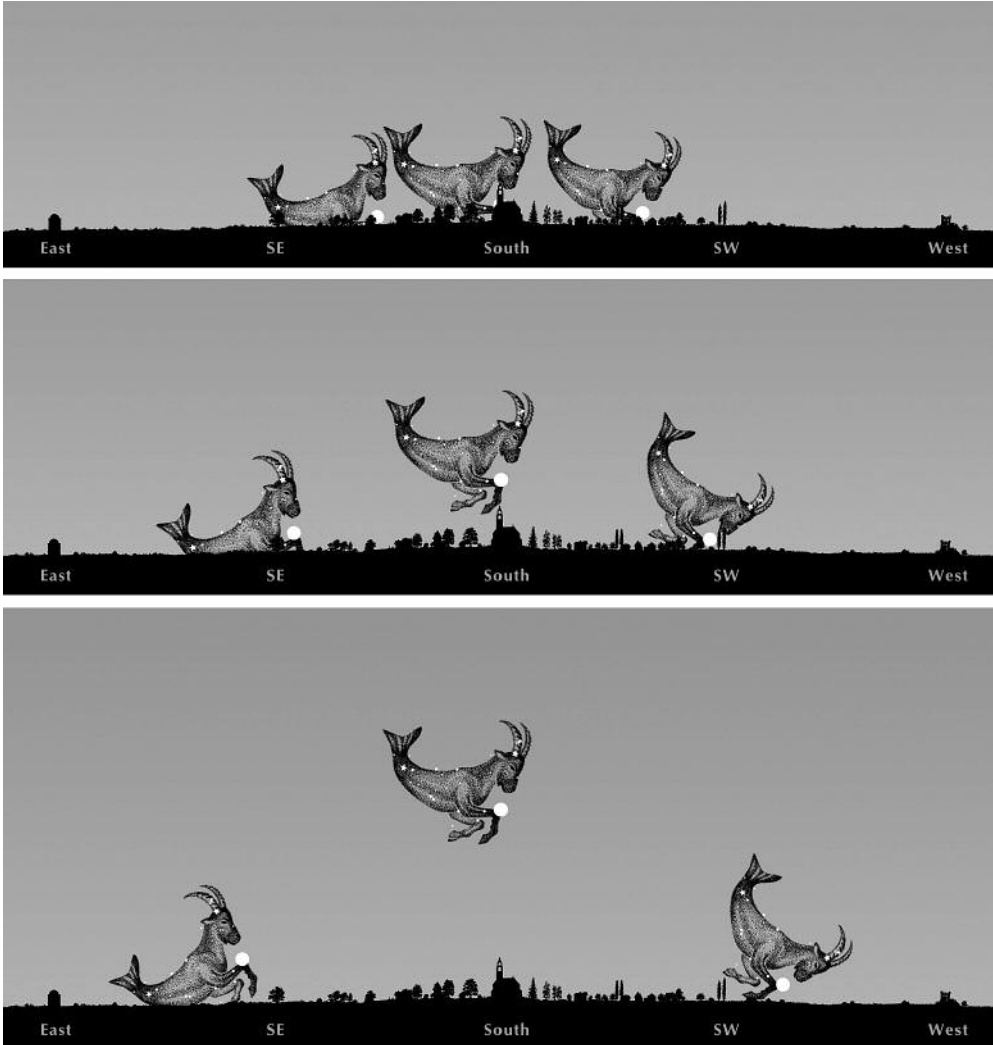
Mars Heading towards Opposition

The pictures 1abc und 3ab show Mars during the night from 27 to 28 July at various locations around the globe. The planet shines

through the whole night with greatest brilliance and reaches the zenith of its path across the sky in the middle of the night.

In September 2017, Mars rose sufficiently early before the sun to become visible again (observed from Switzerland). For months it was visible in the south-east to south. Initially Mars was moving sluggishly away from the sun. But its movement is gaining in energy from week to week and in July it moves away from the sun at great speed. At the end of July, it already becomes visible in the sky looking south-east as dusk sets in and reaches the zenith of its path at about midnight. It has the longest possible visibility during the night and stands in opposition to the sun.

Since September 2017, the increase in its brightness has also been gaining in strength and in July it flares up. In July, it increases astonishingly in size and decreases again at the same rate in August. The achievement of its greatest brightness on 28 July abruptly brings a long and continuous process to an end. During its so-called opposition to the sun, the appearance of Mars is at its most spectacular. We can see remarkable connections: the further the planet moves away from the sun, the more dynamic it becomes in brightness as it heads towards opposition. Several processes reach their peak at the same time and for keen astronomers all the good things arrive at once!



Pictures 1abc: Night of 27 to 28 July: course of Capricorn and Mars across the sky
1a: Oslo, 1b: Kassel, 1c: Athens

Mars' Varied Behaviour

*"Mars his true moving, even as in the heavens
So in the earth, to this day is not known."
Shakespeare in King Henry VI (1591)*

Mars' brightness varies much more, and also more dynamically than that of other planets. Its blazing assailment of the evening sky has

given the reddish planet its name. Its much less apparent characteristics are overlooked. Of all the planets, Mars can by far remain invisible for longest. When it does become visible, it mostly (!) appears only briefly as a faint spot of light. After a very long period as an invisible day planet and a hard to recognise dusk planet, it turns into a dominating

night planet, moving from one extreme to the other. It integrates contradictions and creates a great synthesis.

Mars mostly follows the sun as it swings between its highest and lowest path across the sky and makes its way through the whole of the zodiac. But from mid-May to early November it is in the constellation of Capricorn; each day they rise and set together. For almost half a year it follows a path across the sky together with Capricorn from approximately south-east to south-west. Its loyalty to the constellation and its movement with the sun alternate. Mars is a master of integrating contradictory processes.

Mars also has other movements, rhythms which are of longer duration. Every two years and five to eleven weeks, nights recur in which it can most easily be observed. About one to three months later, in the course of the year, the conditions change and after 15 or 17 years respectively, its brightness increases much more than in other periods of visibility. In summer 2018 keen astronomers can enjoy exceptionally good Mars nights.

The size to which it grows after 15 or 17 years also varies. Several rhythms are each integrated by Mars in new ways. Its course is much too complex for it to be understood, Mars keeps presenting us with new surprises. What a riddle it is. The heavens show us archetypal images which can become our guiding star.

The Obscured Full Moon above Mars

On the day of Mars' opposition something else occurs as well: the moon passes by far to the north. The moon enters opposition to the sun and becomes a full moon. Normally the light of the full moon illuminates its surroundings and the stars and planets fade for the whole of the night. Mars is particularly

bleached out by the full moon when it shines brightly during the night. A global observation such as "the earth is in the middle, Mars and the full moon stand in opposition to the sun" overlooks and negates many things.

But on 27 July the full moon will be increasingly eclipsed, the total eclipse lasting from 21:30 to 23:14 (CET). Mars is far to its south. Find out your local time when the moon and Mars are due to rise.

The (partially) eclipsed Moon and Mars rise together during dusk and in the night sky. At certain times the full moon can look like a dark, rusty brown disk and at other times like a ball with copper, orange, yellow and delicate red colours which merge into one another in a subtle and fluid way. Mars shines particularly brightly in the black sky only in the hours when the moon is totally eclipsed! A rusty brown disk above an intense, yellowy orange coloured light; what a rare and dramatic scene to take place on the evening of 27 July.

The Universal Image in Different Regions

"Mars in opposition to the sun" occurs for the whole of the earth in the constellation of Capricorn. From wherever we look at Mars, it is located in the same stars of Capricorn. But this can give rise to a whole range of different experiences. It is instructive to see how the sky looks in other regions. And a new awareness arises with regard to the familiar qualities of our own location with its specific regional progression of the seasons and its sky.

** Capricorn and Mars in Oslo*

In July, the sky in the far north does not grow sufficiently dark to be able to see the fainter stars in Capricorn. Dusk morphs into dawn. *Picture 1a* shows the course of Mars and Capricorn in regions with a northern latitude

of 60° such as Oslo (southern Norway). There Mars is in the sky from about 23:00 on 27 July to about 04:00 on 28 July (CEST). Mars appears briefly deep in the south of the bluish grey sky. It requires an open horizon and a trained eye to discover it. It does not grow dark enough and the planet rises too little for one to be able to see that Mars "actually" shines brighter than Jupiter under the optimum conditions.

* *Capricorn and Mars in Athens and Kassel*
In southern countries, such as Italy and Greece, the night of the opposition proceeds

completely differently. The further south we are, the earlier the July sun sets and the earlier Capricorn and Mars rise. And the closer we are to the equator, the less time dusk lasts. As darkness falls, the appearance of Mars is more quickly transformed from a dot of light in the blue sky into the great and mighty ruler of the starry world. Capricorn and Mars rise earlier and ascend at a steeper angle, faster and for longer than in northern regions. They shine at a much higher elevation at midnight. As Capricorn rises, the horns are the first thing that becomes visible and as it sets, the fishtail is the last thing to



Picture 3ab: Night of 27 to 28 July: course of Capricorn and Mars across the sky
3a: Nairobi, 3b: Cape Town

disappear. It is easy to see whether it is rising or setting from the position of the image.

Picture 1c is made for Athens (latitude 38° N) where Mars is resplendent in the sky from 21:00 to 06:09 (local time).

Picture 1b shows Mars and Capricorn at latitude 51° N, observed from Kassel, roughly in central Germany, Mars is in the sky during the night of the opposition from about 21:54 to 05:40.

* *Capricorn at the equator and in the southern hemisphere*

At the equator, the sun, planets and stars rise vertically. *Picture 3a* shows that Capricorn rises and sets approximately vertically in relation to the horizon in Nairobi (Kenya, latitude 1° S). The position of the constellation also indicates the direction in which the sea goat and Mars are moving!

Mars rises in Nairobi (Kenya, latitude 1° S) at 18:39 and shines for a good 12 hours in the sky.

Picture 3b is drawn for Cape Town (South Africa, latitude 34° S) where it is winter. Capricorn rises not in the south but the



Picture 2: The Babylonian sea goat, our Capricorn

north and reaches its highest position there with the horns pointing downwards, the knees upwards. In order to be able to see the shape high in the northern sky, we have to stand on our head, bend our head very far backwards or make a great deal of effort in our thinking.

Mars rises at 17:34 and shines for a long night, a good 14½ hours, in the sky.

Capricorn, Goat's Horns with Fishtail

Capricorn looks like a goat's head with a fishtail. The shape is of Babylonian origin. One of the gods was called SUHUR.MAS ("Suhur" means goat, "Mas" fish). *Picture 2* is copied from a boundary stone, probably from 1400-1100 BC.

From about 1200 BC onward, the Babylonians were capable of recognising constellations in the heavens. They observed the rising and setting of the stars and particularly looked towards the eastern sky as night was ending, towards the rising constellation that was returning to visibility. They watched the monthly changes in the morning sky. They had three gods for each month and their names were given to the stars which became visible in the corresponding month in the morning sky. Many of their constellations look beautiful and coherent, particularly as they rise.

What a different impression the rising sea goat makes compared to the setting one. Babylon was at latitude 33° N; in order to be able to recognise the rising sea goat in the setting, one requires a lot of alertness. The Babylonians left a great achievement for humanity.

The ancient Greeks took over the sea goat from the Babylonians in 430 BC at the latest; they called it Aigo-keros "goat horn". The Latin name Capri-cornus is a translation.

"It's true, I can see Capricorn"

Several things are required to see the constellation for the first time in the sky. An inner picture of the (copied!) shape is a great help. It is also of great benefit to inform ourselves in advance about the relationship of the brightest stars to one another. Thanks to Mars, and helped by the knowledge that it is located in Capricorn until mid-November, the greatest obstacle has already been overcome: if we look towards Mars, we are looking at the region of the sky where Capricorn can be found.

The stars of the right horn are relatively easy to discover. After scanning the sky for a little while, suddenly we know: "I can see Capricorn". It is as if an inner flash of lightning pulses through us. We can explain it to others through remarks such as, "The fishtail over there is quite a distance from the horns. The constellation is quite large." Then the other will also soon enjoy the discovery.

In searching for a constellation, there is a living interaction between the outwardly active organs of perception and our inner eye. As we take in the constellation, we are supported by the questions arising within ourselves. We try to think the connections and have them confirmed in the sky. And a great deal also happens in reverse. The current observations awaken earlier impressions we have experienced. The latter have meanwhile created reliable new organs of perception. The moment of "now I can see it" is like a communion between looking outwards and our inner vision. It won't take long before we recognise the constellations by their unmistakable light characteristics. The light composition of a conspicuous constellation imprints itself much more easily than a geometrical pattern can.

Twelve-year-olds enjoy the moment when they discover something for themselves. Such joy gives us trust in our own inner eye.

References:

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