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Mars Opposition

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In their movements around the Sun, the Earth and the planets change their position relative to each other. The planets closest to the Sun move faster and complete their orbits in less time than those further away.

Throughout the Earth year, we see how the planets change their position using the distant stars as a reference; in addition, together with the rest of the stars in the sky, given the change in Earth's position in its orbit, the time and the position in the sky in which we see them vary. From seeing them at dawn in the last hours of the night, until they are visible in the first hours of the night, several months pass. It is possible and entertaining to track the planets and their position in the sky, which is basic for understanding these issues, and which for thousands of years has been the motive and incentive for the study of the celestial bodies and the laws that govern them.

Mars has a very pronounced and noticeable movement in the celestial sphere. If our readers remember, in March, we published an article[1] giving the indications and tips to identify the planets and continue monitoring them as well. At that time, Mars was visible around sunrise in the constellation Sagittarius along with Jupiter and Saturn.

After these months, we can observe that Mars currently appears towards the constellation Pisces (an angular displacement of more than 60 °), which is appearing on the eastern horizon at dusk.

We are near to the opposition of Mars, at which time, seen from Earth, the planet is 180 ° from the Sun; therefore, when the sun has set on the western horizon, we see Mars rise from the eastern horizon. And at dawn, when the sun is rising, we see Mars setting towards the west. In brief, during opposition, Mars is visible throughout the night.

Fig. 1 *View of Mars through a small telescope. The small south polar cap is appreciated (towards the upper right of the image).*

[1] http://www.astronomia.org.bo/astro/266-ReconociendoPlanetas.pdf

On the other hand, the positional variations of Jupiter and Saturn have been between Sagittarius and the limits of the constellation Capricorn; the variations of these two planets are slower, thus we can appreciate them for a much longer time. These days, these planets are visible at dusk in the near Zenith sector of the sky to the west.

To clarify some common doubts.

- These planets are visible to the naked eye throughout the year, except for the weeks when they are in the direction of the Sun, which prevents them from being seen in the night sky.
- To observe Uranus and Neptune, telescopes are required. Nonetheless, Uranus can reach such brightness at certain times that places it at the limit of what the human eye can perceive.
- When the planets are close to their opposition, their brightness is greater, since those are the moments of greatest proximity of their orbits to the Earth. Mercury and Venus are never in opposition, since they are planets of internal orbit; of course, the variation of its distance from the Earth determines variations in its brightness.
- The planets are seen as stars, and they are seen to change their position with respect to the stars that we call "fixed", hence their name: wanderer, vagabond (Greek for planet). Therefore, it is not possible to see the planets with an appreciable disk with the naked eye; this is achieved with a telescope. Sometimes false news has circulated that Mars would be the size of the Moon, and other similar nonsense, to which we must not pay attention.

This Tuesday, October 13, it will be the opposition of Mars, although it is commonly expected that the greatest proximity occurs in the opposition, given the eccentricity of the Martian orbit, this greater proximity occurred a week earlier, on October 6. Of course, the variation in distance is not so excessive, although it implies that between October 6 and 13 there is a difference of almost 2 tenths of an arc second, which implied a 0.8% variation in its apparent diameter. From the point of view of observing it through a telescope, its size is practically the same.

This opposition and the previous one, which occurred in 2018, have been favourable, since the opposition occurs near the perihelion of Mars, which implies that in the opposition, said planet is much closer to Earth than on other occasions. When the opposition occurs in the weeks near the end of August or the beginning of September, we have Mars as close as possible. On the other hand, when said opposition occurs in February-March, it implies that this opposition occurs when Mars is the furthest from the Sun (and also from the Earth), with its apparent size being practically half of what it is when we observe it in the favourable oppositions.

The next favourable opposition of Mars will be on 2035.

The oppositions that occur until that year will show us the smallest Mars, the most unfavourable being the one that occurs in 2027 when Mars will be seen in its maximum proximity only 56% of the size with which we are seeing it these days.

Mars, however, can never be seen as big as Jupiter and Saturn; it is more difficult to see details of its surface. Anyway, those who have a telescope, try to observe Mars these nights. For those who do not have telescopes, you can see it in a reddish hue rising over the horizon after dark.

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(Translated by: Micaela Morales)

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