Astronomía Sigma Octante
Casilla 1491 - Cochabamba – Bolivia
http://www.astronomia.org.bo

Artículo N° 286
2020-09-03

The Moon hides Mars

By: Germán Morales Chávez

It is not that Mars and the Moon play hide and seek. It turns out that in its movement around the Earth, on many occasions we can witness how the Moon passes in front of some star, for example: in front of the Sun, creating a solar eclipse; or in front of certain star, or a planet…

These events allow us to testify the Moon's own movement revolving around the Earth. At the same time this happens, due to Earth's rotation, we see how the Moon and the celestial object to be hidden, with the rest of the stars in the celestial sphere they "move" towards the West, because the Earth is turning to the East.

For an hour, in round numbers, Mars will be hidden, since it will be behind the Moon while it is moving in its orbit around the Earth. The time that the occultation lasts will be less if it does not occur in the central part, and Mars passes behind our satellite further north or south, which depends on where we are.

Whether or not to be able to see the occultation depends on where we are, not only Mars and the Moon must be on the horizon; due to parallax, the Moon seen in the sky has a different position that varies if we are either north or south, or east or west. This determines that only those who are in a certain strip on the earth's surface will be able to observe the occultation, also the time at which it will occur in those privileged places will be at a different time.

This year, there are five occultations of Mars by the Moon (February, March, August, September, and October) of which, only the one occurring in September will be visible from Bolivia.

Of course, there can also be occultations of other planets by the Moon, which we will not be talking about in this opportunity since they are not visible from our region this year.

Fig. 1 – Each month, we see the Moon passing "near to Mars". Last August, this was seen. From further south they could register an occultation, we from Bolivia did not. 'Near' is a concept of angular distance, since in reality Mars is currently 185 times farther away than the Moon from us (Mars is about 71 million kilometres far from us).

Although with the naked eye it is possible to appreciate the occultation, the brightness of the Moon makes it difficult to pinpoint the exact moment in which it occurs. In this case, to use binoculars or a telescope is very suitable.

In astronomy, we are interested in determining the precise moment when the occultation begins and ends, which serves to polish the calculations of the movement of the Moon (and in other cases, from different objects in our solar system). But without the need to do any specific work, it is an engaging and unusual experience, well worth witnessing.

For Bolivia, the occultation will occur on Saturday, September 5, before midnight, between 22:30 (depending on which part of Bolivia you are the variation will be about 4 or 6 minutes before or after) and 13:42 (also this time will be less or more depending on the location of the observer).

By approximately 21:30, we will have Mars rising over the horizon; the Moon would have risen over the same horizon a few minutes earlier. One hour later, the occultation would begin (as we already explained in the previous paragraph). It will be seen how Mars is hidden by the illuminated part of the Moon, and an hour later, it will reappear on the opposite side that is already in dark (it is already night in that region of the Moon).

Therefore, you have to pay attention from 22:20 and, with Mars hidden, wait about 50 minutes to be aware again to the moment when the reappearance of Mars occurs.

Hoping the night sky is clear, it only remains to enjoy the show. Clean and clear skies for everyone!

Article posted on September 3rd, winter 2020

(Translated by: Micaela Morales)

Germán Morales / ASO, Cochabamba 2020/09/01

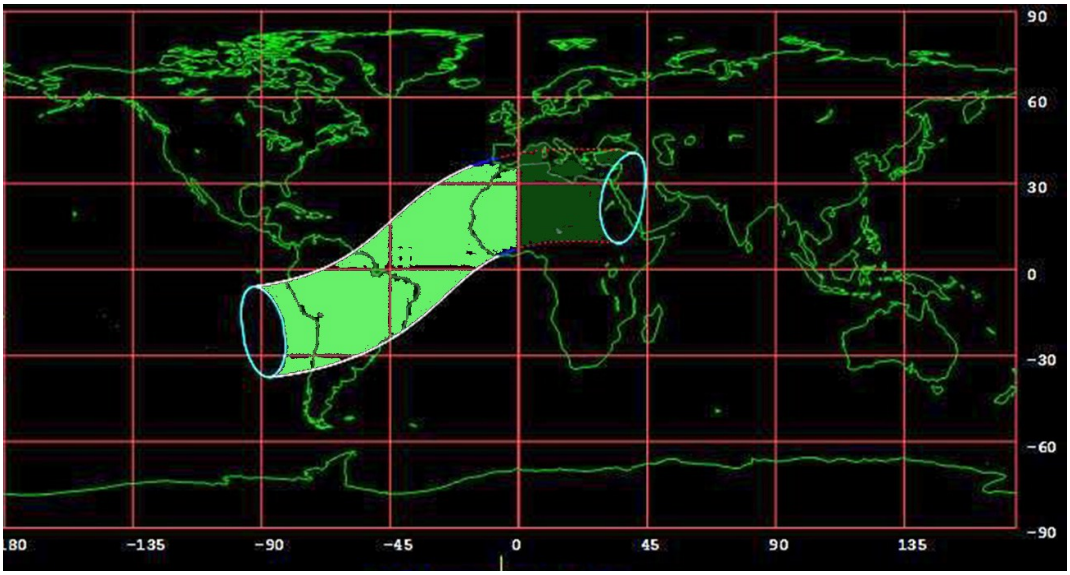

Fig. 2 Without going into big details, the light green sash will see the occultation at night (Hours vary by geographic longitude and parallax).
The part of the dark green stripe is from where you can see the occultation, taking into account that it is already daylight (and the Moon and Mars on the horizon). It can be seen that southern Europe and North Africa can see the hiding by day, Northwest Africa and the Atlantic archipelagos can see the hiding before dawn.