



Public Outreach & Education Committee of **ASTRONOMICAL SOCIETY OF INDIA**

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25th July 2018

Great Opposition of Mars

On the night of 27th July 2018, while we are glued to the Total Lunar Eclipse, another relatively rare celestial phenomenon will also make its mark felt. On this night at 10:37 PM IST, Mars will be in opposition. This means that Mars, Earth, and the Sun will be along a straight line as possible. Mars would rise around the sunset time and will set around the sunrise time. An opposition happens when Mars is the closest to Earth in its orbit, both on the same side of the Sun. Hence the red planet Mars appears brighter and bigger than usual.

Though the opposition of Mars is on 27 July, it comes closest to us on 31 July. This curious fact is because the orbits of all planets around the sun are not a perfect circle, but an ellipse. Because of this, the closest approach of Mars to us will occur 4 days later than its opposition. This is also one of the reasons why the distance between Mars and Earth is not the same during every opposition.

The distance between Mars and the Earth ranges between about 400 million kilometers (2.7 Astronomical Units, or AU) and 56 million k.m. (0.38 AU). The closest approaches occur during oppositions. This time, Mars comes the closest to Earth as compared to any time in the last 15 years. As a consequence, it will also appear to be the biggest and brightest in the last 15 years. At this time, Mars will be 'just' 58 million kilometres (0.39 AU) from the Earth.

In technical terms, the angular diameter of Mars as seen from the Earth will be more than 24" and it will be brighter than -2.75 magnitude. For comparison, the brightest star in the night sky, Sirius will be about 3 times fainter than Mars on that day and the average angular size of the moon is 1800". Evidently, even at closest approach, Mars will seem awfully small!

We would like to caution against creating a hype around this event. For serious astronomers, this event does offer an extraordinary opportunity to study Mars through their telescopes. However, the layperson who might expect to see dramatic details of the surface of Mars would probably be disappointed. Since we are in the middle of the monsoon here in India, the sky is likely to be cloudy. Furthermore, it would take a telescope equipped with a lens or mirror that is at least 6 inches in aperture to discern even the major surface features of Mars. Nonetheless, it would be an exciting opportunity to view the bright red planet right next to the red (eclipsed) moon on that night. Mars can be seen roughly 6 degrees almost exactly south of the eclipsed moon (for comparison, the size of the moon is 0.5 degree).

ASI POEC is happy to help members of press by answering any questions regarding the opposition of Mars and the total lunar eclipse. You can contact the members mentioned on the next page.

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