

Mars and Moon to play hide and seek on April 17, 2021

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Mars is about to perform a vanishing act on April 17, Saturday, in the evening sky, at about Sunset time. It will appear to shine on the shoulder of the Moon. In a jiffy Mars will abruptly disappear into the dark disc of the Moon. It will be hidden by the Moon for about an hour and will emerge once again on the other side of the Moon.

"Moon will hide Mars behind it, just like it hides the Sun during a solar eclipse," says Arvind Paranjpye, Director, Planetarium, Nehru Centre, Mumbai, and a member of the Public Outreach and Education Committee (POEC) of Astronomical Society of India.

Called an 'occultation' in astronomical parlance, the conjunction of a planet with the Moon was seen as samagama (union) in Indian astronomical tradition. As Mars goes behind the Moon, they concluded that Moon is nearer compared to Mars in ancient times. Such occultation events, between Moon and the planets and between two planets, gave the ancient astronomers opportunity to work out the relative distances of the celestial objects.

On April 12, 2021, was a new moon. By April 17, in its waxing phase, about 18 % of Moon's disc is illuminated. On this day, the angle between the Sun and the Moon will be nearly 60°. "We can see the glorious setting Sun plunging towards the western horizon, and halfway up, the crescent Moon. Further, on the eastern direction of the Moon, towards the dark disc side, we can easily spot the red Mars," says Arvind Paranjpye.

The sunset will occur earlier in Eastern India, including Andamans, compared to the Western parts of India. Hence for those in the Eastern region, the occultation will occur much after the sunset. "For India, this will be a mixed bag event. At locations in western India, the occultation will begin when the Sun is still above the horizon," says Arvind Paranjpye.

In Delhi, at evening 6 pm on April 17, the Sun will be about 9 degrees above the horizon. As we continue to observe, the separation between Mars and the Moon will decrease. Finally, precisely at 18:02:07, Mars would go behind the dark disc of the Moon, disappearing from our sight. It will take about 9 seconds for the Mars to be completely eclipsed by the dark disc of the Moon. After about an hour, 19:04:10, Mars will surface at the other side, the bright crescent of the Moon. Timings of disappearance and reappearance of Mars at each location would differ. "We have computed the precise timings for 124 locations in India, which can be accessed at our website ", says Arvind Paranjpye. The details can be accessed at <https://astron-soc.in/outreach/activities/sky-event-related/moonmars2021/#info>.

We need to choose a spot carefully to observe this spectacle, says Arvind Paranjpye. It has to be a place with an unhindered view towards the West. One must reach the selected site by around 530 and stand facing the western sky. "Although, the spectacle is not a rare one, last time the occultation of Mars by the Moon, visible over India in the evening, was on May 10 2008," says Arvind Paranjpye.

The POEC of the Astronomical Society of India will webcast this event live from various locations. Visit <https://astron-soc.in/outreach/activities/sky-event-related/moonmars2021/> for a list of those who will webcast it live.

Table 1

Timings of disappearance and reappearance at major locations: A blank under the Sun altitude indicates that the Sun is well below the horizon

	Locations	Disappearance			Reappearance		
		Time IST	Sun alt	Moon alt	Time IST	Sun alt	Moon alt
1	Ahmedabad	17:34:59	19	77	19:13:14	-4	55
2	Bengaluru	17:49:21	10	66	19:33:02		43
3	Chennai	17:57:46	5	62	19:38:12		40
4	Guwahati	18:39:37		46	19:21:13		37
5	Hyderabad	17:50:17	9	67	19:32:17		44
6	Jaipur	17:52:44	12	71	19:08:59	-5	54
7	Kanyakumari	17:56:24	7	62	19:30:17		42
8	Kolkata	18:22:12	-6	52	19:34:10		36
9	Mumbai	17:31:52	19	76	19:19:45	-6	52
10	Mumbai South	17:31:45	19	76	19:19:41	-6	52
11	New Delhi	18:02:07	9	67	19:04:10	-4	54
12	Port Blair	18:29:48		43	19:54:42		24



Image credit: NASA JPL