

IMPORTANT ASTRONOMICAL EVENTS FOR THE YEAR 2023

January

- 4 Earth closest to the Sun. Moves at a distance of about 14,70,98,925 km
- 3, 4 - Quadrantids Meteor Shower. The Quadrantids is a meteor shower, with up to 40 meteors per hour. It is thought to be produced by dust grains left behind by an extinct comet known as 2003 EH1, which was discovered in 2003. Best viewing will be from a dark location after midnight. Meteors will radiate from the constellation Bootes.
- 7 Full Moon.
- 22 New Moon
- 22-23 Saturn Venus Conjunction. Venus appears less than a degree from Saturn.
- 30 Mercury at Greatest Western Elongation. The planet Mercury reaches greatest western elongation of 25 degrees from the Sun. The planet can be spotted low in the eastern sky just before sunrise.

February

- 5 Full Moon.
- 20 New Moon

March

- 7 Full Moon
- 21 March Equinox. The Sun will shine directly on the equator and there will be nearly equal amounts of day and night throughout the world. This is also the first day of spring (vernal equinox) in the Northern Hemisphere and the first day of fall (autumnal equinox) in the Southern Hemisphere.
- 21 New Moon
- 24 Moon and Venus – Occultation. Can be seen very close to each other (less than 0.5 degree) in the western sky.

April

- 6 Full Moon
- 11 Mercury at Greatest Eastern Elongation. Mercury at Greatest Eastern Elongation. The planet Mercury reaches greatest eastern elongation of 19.5 degrees from the Sun. The planet can be spotted low in the western sky just after sunset.

20 New Moon

20 Hybrid Solar Eclipse. A hybrid solar eclipse occurs when the Moon is almost too close to the Earth to completely block the Sun. This type of eclipse will appear as a total eclipse to some parts of the world and will appear annular to others. The eclipse path will begin in the southern Indian Ocean and move across parts of Western Australia and southern Indonesia.

Totality for this eclipse will be visible in the North West Cape peninsula and Barrow Island in Western Australia, eastern parts of East Timor, as well as Damar Island and parts of the province of Papua in Indonesia.

It is a hybrid eclipse, with portions of its path near sunrise and sunset as annular.

Partial Eclipse: southeast Asia, East Indies, Australia, Philippines, New Zealand

Hybrid Eclipse: Australia, Timor-Leste, Indonesia (West Papua and Papua)

Partial Solar eclipse beginning: 07:04 (IST); Full Solar eclipse beginning: 08:07 (IST); Maximum hybrid Solar eclipse: 09:46 (IST); Full eclipse ending: 11:26 (IST); Partial eclipse ending: 12:29 (IST)

Eclipse not visible in India

22, 23 Lyrids Meteor Shower. The Lyrids is an average shower, producing about 20 meteors per hour at its peak. It is produced by dust particles left behind by comet C/1861 G1 Thatcher, which was discovered in 1861. The shower runs annually from April 16-25. Best viewing will be from a dark location after midnight. Meteors will radiate from the constellation Lyra, but can appear anywhere in the sky.

May

5 Full Moon

5 Penumbral Lunar Eclipse. A penumbral lunar eclipse occurs when the Moon passes through the Earth's partial shadow, or penumbra. During this type of eclipse the Moon will darken very slightly but not completely. The eclipse will be visible throughout all of Asia and Australia and parts of eastern Europe and eastern Africa.

Penumbral Eclipse begins at 20:44 (IST); Maximum Eclipse at 22:53 (IST)
Penumbral Eclipse ends on 6 May, at 01:01 (IST)

6, 7 Eta Aquarids Meteor Shower. The Eta Aquarids is an above average shower, capable of producing up to 60 meteors per hour at its peak. Most of the activity is seen in the Southern Hemisphere. In the Northern Hemisphere, the rate can reach about 30 meteors per hour. It is produced by dust particles left behind by comet Halley. Meteors will radiate from the constellation Aquarius, but can appear anywhere in the sky.

- 19 New Moon
- 29 Mercury at Greatest Western Elongation. The planet Mercury reaches greatest western elongation of 24.9 degrees from the Sun. visible in the eastern sky just before sunrise.

June

- 4 Full Moon
- 4 Venus at Greatest Eastern Elongation. The planet Venus reaches greatest eastern elongation of 45.4 degrees from the Sun. Visible in the western sky after sunset.
- 18 New Moon
- 21 June Solstice. The June solstice. The North Pole of the earth will be tilted toward the Sun. The Sun will have reached its northernmost position in the sky and will be directly over the Tropic of Cancer at 23.44 degrees north latitude. This is the first day of summer (summer solstice) in the Northern Hemisphere and the first day of winter (winter solstice) in the Southern Hemisphere.

July

- 3 Full Moon, Supermoon. This is also the first of four supermoons for 2023. The Moon will be near its closest approach to the Earth and may look slightly larger and brighter than usual (*Moon at Perigee on July 4*)
- 17 New Moon
- 28, 29 Delta Aquarids Meteor Shower. The Delta Aquarids is an average shower that can produce up to 20 meteors per hour at its peak. It is produced by debris left behind by comets Marsden and Kracht. Meteors will radiate from the constellation Aquarius, but can appear anywhere in the sky.

August

- 1 Full Moon, Supermoon. The Moon will be near its closest approach to the Earth and may look slightly larger and brighter than usual (*Moon at Perigee on August 2*)
- 10 Mercury at Greatest Eastern Elongation. The planet Mercury reaches greatest eastern elongation of 18.6 degrees from the Sun. The planet can be spotted low in the western sky just after sunset.
- 12, 13 Perseids Meteor Shower. The Perseids produces up to 60 meteors per hour at its peak. It is produced by comet Swift-Tuttle, which was discovered in 1862. Meteors will radiate from the constellation Perseus.
- 16 New Moon

27 Saturn at Opposition.

The planet will be at its closest approach to Earth and its face will be fully illuminated by the Sun. This is the best time to view Saturn. It rises inside the constellation Aquarius. It will have a visual magnitude of 0.4, and an angular diameter of the disk of the planet will be 19 arc seconds wide. The Planet will be at a distance of 131 crore km away at this closest approach. The rings will be inclined at an angle of 9° to our line of sight. A medium-sized or larger telescope will allow us to see Saturn's rings and a few of its brightest moons. Opposition of Saturn will occur about once **every 378 days**.

2022 Saturn opposition: August 14

2023 Saturn opposition: August 27

2024 Saturn opposition: September 8

- 31 Full Moon, **Supermoon, Blue Moon**. This is the third of four supermoons for 2023. The Moon will be near its closest approach to the Earth and may look slightly larger and brighter than usual (*Moon at Perigee on August 30*). Since this is the second full moon in the same month, it is sometimes referred to as a blue moon.

September

- 15 New Moon
- 22 Mercury at Greatest Western Elongation. The planet Mercury reaches greatest western elongation of 17.9 degrees from the Sun. The planet can be spotted low in the eastern sky just before sunrise.
- 23 September Equinox. The Sun will shine directly on the equator and there will be nearly equal amounts of day and night throughout the world. This is also the first day of fall (autumnal equinox) in the Northern Hemisphere and the first day of spring (vernal equinox) in the Southern Hemisphere.
- 29 Full Moon, Supermoon. This is the last of four supermoons for 2023. The Moon will be near its closest approach to the Earth and may look slightly larger and brighter than usual (*Moon at Perigee on September 28*).

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- 7 Draconids Meteor Shower. The Draconids is a minor meteor shower producing only about 10 meteors per hour. It is produced by dust grains left behind by comet 21P Giacobini-Zinner, which was first discovered in 1900. Best viewing will be in the early evening from a dark location far away from city lights. Meteors will radiate from the constellation Draco, but can appear anywhere in the sky.

14 New Moon

14 Annular Solar Eclipse. An annular solar eclipse occurs when the Moon is too far away from the Earth to completely cover the Sun. This results in a ring of light around the darkened Moon. The Sun's corona is not visible during an annular eclipse. The eclipse path will begin in the Pacific Ocean off the coast of southern Canada and move across the south western United States and Central America, Columbia, and Brazil. A partial eclipse will be visible throughout much of North and South America.

Globally, eclipse begins at 20:33 (IST); Maximum Eclipse will be at 23:29 (IST); Eclipse will end on 15 Oct, at 02:25 (IST)

Not visible in India

21, 22 Orionids Meteor Shower. It can produce up to 20 meteors per hour at its peak. It is produced by dust grains left behind by comet Halley. Best viewing will be from a dark location after midnight. Meteors will radiate from the constellation Orion, but can appear anywhere in the sky.

23 Venus at Greatest Western Elongation. The planet Venus reaches greatest eastern elongation of 46.4 degrees from the Sun. The planet will be visible in the eastern sky before sunrise.

29 Full Moon

28-29 Partial Lunar Eclipse. A partial lunar eclipse occurs when the Moon passes through the Earth's partial shadow, or penumbra, and only a portion of it passes through the darkest shadow, or umbra. During this type of eclipse a part of the Moon will darken as it moves through the Earth's shadow. The eclipse will be visible throughout all of Europe, Asia, and Africa, and Western Australia.

Partial Eclipse begins (on 29th early morning) at 01:05 (IST); Maximum Eclipse will be at 01:44 (IST) Partial Eclipse ends at 02:23 (IST)

Only 6.0% of the Moon's disc will be covered by Earth's darker shadow at maximum eclipse.

November

3 Jupiter at Opposition. The giant planet will be at its closest approach to Earth and its face will be fully illuminated by the Sun. It will be brighter than any other time of the year and will be visible all night long

Due to the movements of the Earth and the planet Jupiter around the Sun, once in 398.9 days Jupiter comes opposite to the Sun. (27 Sep 2022; 03 Nov 2023; 08 Dec 2024)

The apparent angular size of Jupiter will grow to 48.4 arc-seconds (one arc second is 1/3600th of a degree) as the distance between the earth and Jupiter will reduce to **59.5 crore kilometers**. On the average at its most distant point, the distance between the Earth and the Jupiter will be about 93 crore km

13 New Moon

17,18 Leonids Meteor Shower. The Leonids shower could produce up to 15 meteors per hour at its peak. The Leonids is produced by dust grains left behind by comet Tempel-Tuttle, which was discovered in 1865. Best viewing will be from a dark location after midnight. Meteors will radiate from the constellation Leo, but can appear anywhere in the sky.

27 Full Moon

December

4 Mercury at Greatest Eastern Elongation. The planet Mercury reaches greatest eastern elongation of 21.3 degrees from the Sun. The planet can be seen low in the western sky just after sunset.

13 New Moon

13,14 Geminids Meteor Shower. The Geminids can produce up to 120 multicolored meteors per hour at its peak. It is produced by debris left behind by an asteroid known as 3200 Phaethon, which was discovered in 1982. Best viewing will be from a dark location after midnight. Meteors will radiate from the constellation Gemini, but can appear anywhere in the sky.

22 December Solstice. The South Pole of the earth will be tilted toward the Sun, which will have reached its southernmost position in the sky and will be directly over the Tropic of Capricorn at 23.44 degrees south latitude. This is the first day of winter (winter solstice) in the Northern Hemisphere and the first day of summer (summer solstice) in the Southern Hemisphere.

28 Full Moon