

IMPORTANT ASTRONOMICAL EVENTS FOR THE YEAR 2021

January

- 2 Earth closest to the Sun. Moves at a distance of about 147,093,168 km
- 2, 3 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.
- 12 Venus 1.5°N of Moon.
- 13 New Moon.
- 24 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.
- 24 Saturn in Conjunction with Sun (aligned in the direction of the Sun).
- 29 Full Moon.
- 29 Jupiter in Conjunction with Sun (aligned in the direction of the Sun).

February

- 11 New Moon.
- 27 Full Moon.

March

- 6 Mercury at Greatest Western Elongation. The planet Mercury reaches greatest western elongation of 27.3 degrees from the Sun. The planet can be spotted low in the eastern sky just before sunrise.
- 13 New Moon.
- 20 March Equinox. The March equinox occurs at 14:57IST. 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.

20 Venus at Greatest Western Elongation. The planet Venus reaches greatest eastern elongation of 46.6 degrees from the Sun. The bright planet can be spotted in the eastern sky before sunrise.

26 Venus at Superior Conjunction (aligned in the direction of the Sun).

29 Full Moon.

April

12 New Moon.

22, 23 Lyrids Meteor Shower. It produces 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. Meteors will radiate from the constellation Lyra.

27 Full Moon –Perigee full moon (Supermoon). Moon will be moving at a distance of 357379 km. closest approach to the Earth. The full moon will appear bigger and brighter.

May

6, 7 Eta Aquarids Meteor Shower. It is capable of producing up to 60 meteors per hour at its peak. Meteors will radiate from the constellation Aquarius, but can appear anywhere in the sky.

11 New Moon.

17 Mercury at Greatest Eastern Elongation. The planet Mercury reaches greatest eastern elongation of 22 degrees from the Sun. The planet can be spotted low in the western sky just after sunset.

26 Full Moon. Apogee full moon (Supermoon). Moon will be moving at a distance of 357310 km. Closest approach to the Earth. The full moon will appear bigger and brighter.

26 Total Lunar Eclipse. A total lunar eclipse occurs when the Moon passes completely through the Earth's dark shadow, or umbra. During this type of eclipse, the Moon will gradually get darker and then take on a rusty or blood red color. The eclipse will be visible throughout the Pacific Ocean and parts of eastern Asia, Japan, Australia, and western North America.

Partial phase of the eclipse begins at 14:17 (IST); Full eclipse begins at 16:41 (IST); Maximum eclipse will be at 16:48 (IST); Full eclipse ends at 16:56 (IST); Partial eclipse ends at 18:22 (IST). Umbral Eclipse not visible in India as the Moon will be below the horizon.

June

- 10 New Moon.
- 10 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 path of this eclipse will be confined to extreme eastern Russia, the Arctic Ocean, western Greenland, and Canada. A partial eclipse will be visible in the northeastern United States, Europe, and most of Russia.
- Not visible in India.** Globally the eclipse begins at 13:42 hours (IST) and ends at 18.41 hours (IST). Maximum eclipse will be at 16:11 hours (IST).
- 21 June Solstice. The June solstice occurs at 08:51 IST. The North Pole of the earth will be tilted toward the Sun, which 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 summer solstice in the Northern Hemisphere and winter solstice in the Southern Hemisphere.
- 24 Full Moon, Perigee full moon (Supermoon). Moon will be moving at a distance of 360339 km. Close approach to the Earth. The full moon will appear bigger and brighter..

July

- 4 Mercury at Greatest Western Elongation. The planet Mercury reaches greatest western elongation of 22 degrees from the Sun. This is the best time to view Mercury since it will be at its highest point above the horizon in the morning sky. The planet can be spotted low in the eastern sky just before sunrise.
- 5 Earth at farthest distance from the Sun. Moves at 152,100,525 km
- 10 New Moon.
- 24 Full Moon.
- 28, 29 Delta Aquarids Meteor Shower. The Delta Aquaridsshower can produce up to 20 meteors per hour. 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.
- 29 Mars 0.6°N of Regulus (a star in Leo – visible in western horizon at sunset).

August

- 2 Saturn Opposition. (Distance 133.7crore km). The ringed 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 Capricornus. It will have a visual magnitude of 0.2, and an angular diameter of 42 arc seconds from ring tip to ring tip, the disk of the planet will be 18.6 arc seconds wide. The Planet will be at a distance of 133.7crore km away at this closest approach. The rings will be inclined at an angle of 18° 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. Lastly Saturn opposition occurred on 21 July 2020 Next Opposition will be on 14 Aug 2022.
- 8 New Moon.
- 12, 13 Perseids Meteor Shower. The Perseids is one of the best meteor showers to observe, producing 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.
- 19 Jupiter at Opposition. Jupiter oppositions repeat after about one year and one month (~399 days). The giant planet will be diametrically opposite to the Sun and will be at its closest approach to the Earth. It comes to a distance of about 59.99crore km. Its face will be fully illuminated by the Sun. It will have a visual magnitude of -2.9, with an angular diameter of 48 arc seconds. Jupiter will be in the constellation Capricornus. Earlier, on 14 July 2020 it occurred, again on 27September 2022, Jupiter will be at opposition.
- 22 Full Moon.

September

- 7 New Moon.
- 14 Mercury at Greatest Eastern Elongation. The planet Mercury reaches greatest eastern elongation of 26.8 degrees from the Sun. The planet can be spotted low in the western sky just after sunset.
- 20 Full Moon.
- 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.

October

- 6 New Moon.
- 8 Mars in Conjunction with Sun (aligned in the direction of the Sun).
- 20 Full Moon.

- 21, 22 Orionids Meteor Shower. It is an average shower producing up to 20 meteors per hour at its peak. It is produced by dust grains left behind by comet Halley, which has been known and observed since ancient times. Meteors will radiate from the constellation Orion.
- 25 Mercury at Greatest Western Elongation. The planet Mercury reaches greatest western elongation of 18.4 degrees from the Sun. This is the best time to view Mercury since it will be at its highest point above the horizon in the morning sky. The planet can be spotted low in the eastern sky just before sunrise.
- 29 Venus at Greatest Eastern Elongation. The planet Venus reaches greatest eastern elongation of 47 degrees from the Sun. This is the best time to view Venus since it will be at its highest point above the horizon in the evening sky. The planet can be spotted high in the western sky after sunset.

November

- 4 New Moon.
- 17, 18 Leonids Meteor Shower. The Leonids is an average shower, producing 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. Meteors will radiate from the constellation Leo.
- 19 Full Moon.
- 19 Partial Lunar Eclipse. A partial lunar eclipse occurs when only a portion of the Moon passes through the darkest shadow of the Earth, or umbral shadow of the Earth. 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 most of eastern Russia, Japan, the Pacific Ocean, North America, Mexico, Central America, and parts of western South America. Globally, the eclipse begins at 12:48 (IST); ends at 16:17 (IST). Maximum eclipse will be at 14:32 (IST). The eclipse can be seen in the places where the Moon is visible in the sky during this period. Not visible in India.

December

- 4 New Moon.
- 4 Total Solar Eclipse. A total solar eclipse occurs when the moon completely blocks the Sun, revealing the Sun's beautiful outer atmosphere known as the corona. The path of totality for this eclipse will be limited to Antarctica and the southern Atlantic Ocean. A partial eclipse will be visible throughout much of South Africa. Globally, partial phase of the eclipse begins at 10:59 (IST); totality begins at 12:30 (IST); maximum eclipse will be at 13:03 (IST) the totality ends at 13:36 (IST); partial eclipse ends at 15:07 (IST). Eclipse not visible in India.

- 13, 14 Geminids Meteor Shower. The Geminids is the king of the meteor showers. It is considered by many to be the best shower in the heavens, producing 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. The shower runs annually from December 7-17. It peaks this year on the night of the 13th and morning of the 14th. Meteors will radiate from the constellation Gemini, but can appear anywhere in the sky.
- 19 Full Moon.
- 21 December Solstice. The December solstice occurs at 21:20 (IST). 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 winter solstice in the Northern Hemisphere and summer solstice in the Southern Hemisphere.