Outstanding astronomical events in 2025

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The skies of 2025 will be filled with many exciting sights, from partial solar and total lunar eclipses to illuminated planets, meteor showers, supermoons, and more.

January

January 1 - 12: Watch the Quadrantid Meteor Shower

The new year starts with a bang with the Quadrantids, one of the biggest annual meteor showers. Active from December 28, 2024 to January 12, 2025, this meteor shower is famous for its 'fireballs', extremely bright meteors.

In 2025, the Quadrantids will peak on the night of January 4, with a possible rate of up to 120 meteors per hour at its peak. The rising crescent moon may overshadow some of the fainter meteors on this night, although fortunately it will set below the horizon just before 10pm in the UK.

To see this meteor shower warm and beautiful, find a dark location with no light pollution and fill your view with as much sky as possible. To see if you can see the Quadrantids, keep an eye out for their bright spot, which is located in the northern constellation Boötes.

January 4: See Saturn Hidden Behind the Moon

An occultation in astronomy occurs when: from our point of view on Earth, one celestial body appears to pass in front of another.

On January 4 from the UK we will see a lunar occultation of Saturn, meaning Saturn will appear to pass behind the Moon, as the Moon approaches its first quarter phase.

At around 5pm, Saturn will appear to nearly touch the north-west side of the Moon, and then disappear behind the Moon's shadow. At around 6.30pm, Saturn will reappear from behind the south-east side of the Moon.

Other regions will not see the occultation, but Saturn and the Moon will appear close together in the sky, known as a conjunction.

January 10: Venus at greatest eastern elongation

Venus and Mercury are bright enough to be seen with the naked eye, but because they are closer to the Sun than Earth, they are rarely far from the Sun in the sky. This makes them sometimes difficult or even dangerous to see. This is especially true of Mercury, which is smaller, dimmer, and closer to the Sun than Venus.

If you want to see these rocky worlds for yourself, the best way is usually to wait until they are at their most elongated. This is when each planet is farthest from the Sun and therefore most likely to still be above the horizon when the glaring Sun sets.

Venus will reach greatest eastern elongation (and thus be visible in the morning) on ??January 10 and greatest western elongation (visible in the evening) on ??June 1, 2025.

January 16: Mars at its brightest

When a planet is directly opposite the Sun, it is illuminated from all sides. On January 16, Mars will be directly opposite the Sun, giving you a great opportunity to gaze at the beautiful red planet.

January 21: A Gathering of the Planets

If you're a fan of planet-gazing, set a reminder for after sunset on January 21, when you'll be able to spot five planets — Saturn, Venus, Uranus, Jupiter and Mars — dotting the sky until around 9 p.m.

Saturn, Venus and Jupiter will be easily visible as bright white points of light and Mars as an orange dot, but Uranus is quite dim and will require very dark skies or a telescope to try to see it.

February

Searching for another galaxy

February kicks off what's known as 'galactic season' in the Northern Hemisphere, where we have our best chance of seeing distant 'cities' of gas, dust and stars.

The new moon on February 28 gives you a chance to escape the light pollution of the Moon and get a closer look at some galaxies.

A popular astronomy and astrophotography target is the Andromeda Galaxy, one of our nearest galactic neighbors, located about 2.5 million light years away. You'll find it near the constellations Andromeda and Cassiopeia. For the best chance of seeing it, go somewhere relatively dark to look with a telescope, or especially dark to look with a small pair of binoculars. Under very dark, clear skies, you can sometimes even see it as a tiny smudge with the naked eye!

March

March 8 - Mercury reaches greatest elongation

Mercury will reach greatest eastern elongation, its farthest point from the Sun, for the first time in 2025 on March 8. Since this is eastern elongation, this will be best seen in the morning.

Mercury's greatest eastern elongation will occur again on July 4 and October 29, and it will reach its greatest western elongation (best seen in the evening) on ??April 21, August 19, and December 7, 2025.

As with any observation near the Sun, make sure you do not look directly at the Sun, and if observing with a telescope or binoculars, wait until after sunset or before sunrise to avoid accidentally pointing them at the Sun.

March 20 – Spring Equinox

The change in the length of day and night is due to the tilt of the Earth. As the Earth orbits the Sun, during some parts of the year the Northern Hemisphere is tilted toward the Sun and the Southern Hemisphere is tilted away from the Sun. During the other half of the year, the opposite happens.

The vernal equinox occurs when neither hemisphere is tilted toward or away from the Sun and has approximately equal amounts of daylight and darkness. On the other hand, the winter solstice occurs when a particular hemisphere is tilted toward or away from the Sun, resulting in long days or long nights.

The vernal equinox will occur on March 20 in the Northern Hemisphere and this is when astronomical spring is said to begin.

March 23 – Saturn's rings 'disappear'

Saturn is known as the 'jewel of the Solar System' for its magnificent ring system. However, on March 23, these iconic rings will disappear. This is because the Earth's orbit crosses the plane of the rings, a rare event that happens about once every 15 years. In other words, the flat disk of rings will be on edge from our perspective.

Galileo was the first to notice the rings disappearing from view during an airplane flyby in 1612. At the time, it was thought that the rings were actually satellites of Saturn, leading Galileo to wonder if "Saturn devours its children."

Flybys have been very useful to astronomers in revealing Saturn's secrets. Things that would otherwise be hidden can be seen when the rings are on edge - several of Saturn's moons have been discovered this way!

On March 23, Saturn will be very close to the Sun in the sky, which means we won't be able to see the planet during our flyby. Still, it's nice to know that our planet will line up perfectly with Saturn's iconic rings.

April

April 16 - 25: Keep an eye out for the Lyrid meteor shower

In 2025, the Lyrid meteor shower will be visible from April 16 to 25, peaking on April 22.

Although not one of the most active annual meteor showers, the Lyrids can still dazzle the eyes – some meteors streak bright dust across the sky for a few seconds.

Furthermore, at peak time on the night of 22nd and morning of 23rd April, the Moon will be below the horizon until around 4am BST, so there will be no light pollution, creating ideal conditions for peak viewing.

The Lyrid meteor shower is produced by debris from Comet C/1861 G1 Thatcher, which makes one orbit around the Sun every 415 years. It is the oldest recorded meteor shower still visible today, and was first recorded in 687 BC.

May

April 19 – May 28: Eta Aquariid Meteor Shower

The Eta Aquariid meteor shower runs from April 19 to May 28, peaking around midnight and early morning on May 5 with predicted rates of up to 40 meteors per hour.

This meteor shower is more visible in the Southern Hemisphere and will appear low in the Northern Hemisphere's sky in the early morning hours before dawn. However, the shower can still be seen in the eastern sky even when the brightest point is below the horizon.

In 2025, the Eta Aquariid meteor shower begins when the Moon is in its gibbous phase, with its peak on May 5 occurring one day after the first quarter moon, resulting in slightly unfavorable viewing conditions.

June

June 21 – Summer Solstice

The Northern Hemisphere will mark the summer solstice on June 21, the 'longest day of the year', when there will be around 16.5 hours of daylight.

The exact moment of the summer solstice is 3:42am BST, which is when the Northern Hemisphere is tilted furthest towards the Sun. From this point onwards, the days get shorter until the winter solstice on 21 December.

July and August

July 17 – August 24: Perseid Meteor Shower

In July and August, the Perseid meteor shower takes place, a highlight on many astronomers' calendars due to its high hourly rate and bright meteors. At its peak, you can see up to 150 meteors per hour, and you might even catch a few fireballs.

In 2025, the Perseid meteor shower will run from July 17 to August 24, peaking on August 12. Sadly, this year the shower peaks three days after the full moon, so viewing conditions won't be ideal. However, the shower's longer duration gives you a better chance of seeing some Perseid meteors, such as around the new moon on July 24 or August 23. The meteors will radiate from the constellation Perseus.

September

September 7 – Total Solar Eclipse

The Moon will rise above the horizon just as we can see this total solar eclipse from the UK. The eclipse will peak at 7.33pm BST, as the actual eclipse peaks at 7.11pm when the Moon is below the horizon. The Moon will then gradually move out of the Earth's shadow until 9.55pm.

During a solar eclipse, the Moon will appear red because it is illuminated by light that passes through the Earth's atmosphere and is bent back toward the Moon due to refraction.

Since the Moon will be low on the horizon and quite difficult to see, find a high spot with a clear view to the east to be able to observe most of this eclipse.

September 19 – Venus eclipses the Moon

In September, we will get to observe the movement of the Solar System as Venus temporarily disappears behind the Moon.

This lunar eclipse will be visible from Africa, western Russia, Canada, Asia and Europe, including London. Venus will pass behind the Moon at 12:55pm BST and reappear at around 2:14pm BST.

September 21 – Saturn at its best

Saturn reaches opposition on September 21, meaning it will be directly opposite the Sun in the sky and therefore look especially bright to us.

As one of the most visible planets to reach opposition, this could be a good opportunity to try to get some photos of the gas giant.

September 22 - Autumnal Equinox

In 2025, the autumnal equinox will occur on 22 September at 7.20pm BST. On this day, the Sun will shine equally on the Northern and Southern Hemispheres, and day and night will be of roughly equal length.

The full moon closest to the autumnal equinox, which usually falls in September, is called the Harvest Moon. It gets its name because traditionally the light of the Moon helped farmers work late into the night to harvest their crops.

October

October 2 – November 7: Orionid Meteor Shower

With a peak rate of about 25 meteors per hour, the Orionid meteor shower is active from October 2 to November 7 and peaks for about a week around October 22.

Plus, in 2025, the Moon will be at its peak, meaning the skies will be nice and dark for spotting some meteors.

Orionid meteors tend to be particularly fast and continuous. They originate from Comet 1P/Halley, also known as Halley's Comet.

November

Pleiades, 'Seven Sisters'

November is a great time to observe the Pleiades star cluster, one of the most recognizable constellations (star patterns) to spot in the winter night sky.

This open cluster is located in the constellation Taurus the Bull and is visible to the naked eye. While you might think there are only seven stars in the cluster, there are actually more than 1,000 stars, but usually only six are visible to the naked eye. However, keen-eyed stargazers may be able to spot more members of this 'family.'

November 5 and December 4 - Supermoon

Have you ever looked up at the Moon and thought it looked especially big and bright? Maybe your eyes aren't deceiving you - sometimes the Moon is closer to us in its elliptical orbit, making it appear especially large.

The moon's closest point to us is called perigee, and when a full moon appears very close to perigee, we call it a supermoon. At this point, the full moon will appear up to 14% larger and 30% brighter than when it is at its farthest point (apogee).

There will be two supermoons in 2025, one on November 5 and one on December 4.

December

December 4 - 20: Geminid Meteor Shower

The Geminid meteor shower, which can produce up to 150 meteors per hour, is often one of the best meteor shower displays you can see all year.

In 2025, the Geminid meteor shower will be active between December 4 and 20, peaking on December 14. In 2025, the peak occurs when the Moon is a thin crescent, so fortunately lunar light pollution won't be too much of an issue with this meteor shower.

The Geminid meteor shower tends to be slower than most other meteor showers, so they tend to last longer. To spot them, fill your field of vision with sky and wait for the lights to appear. And, since this is a midwinter wonder, don't forget to dress warmly!

December 21 - Winter Solstice

The winter solstice, the moment when the Northern Hemisphere is tilted farthest away from the Sun, will occur on December 21, 2025. On that day, there will be just under eight hours of daylight in London. While many people celebrate all day, the exact moment of the winter solstice will be 3:03 p.m. GMT.