

# The Night Sky in October

## The Astronomical Sky Above Edinburgh and Lothian showing celestial events and tips on what you will see if you look up this month.

The October sky over Edinburgh and Lothian sees a Lunar eclipse and 5 meteor showers but—hold on to your hats—these events will, in the main, not be the most spectacular show. If you do want a spectacular show, consider visiting North America, Central America or South America on the 14 October and watch an annular (Solar) eclipse streak across the Earth!

October's highly visible Lunar eclipse occurs when the Moon lies within the Earth's shadow and the Moon (in the umbra) can take on a coppery-red hue. For Edinburgh and Lothian, the (penumbral) eclipse will begin on 28 October at 7:02 pm in Aries. The umbral eclipse will begin at 8:35 pm and peak at 9:14 pm. At best, though, only about 6% of the Moon's disk will be covered by the Earth's umbra—clipping the edge, really—before the umbral phase ends at 9:53 pm. The (penumbral) eclipse ends at 11:26 pm. Approximately 6 billion people, worldwide, will be able to see the entire eclipse and the population of Edinburgh and Lothian is amongst them.

Yet we get ahead of ourselves: during autumn, the Sun's peak altitude continues to dip lower in the sky as the Sun starts its October stroll in Virgo and enters Libra on 31 October at 12:14 pm. Daylight shortens from 11.564 hours to 9.307 hours so we gain 2 hours and 15 minutes of night time by the end of the month.

The Moon enters last quarter on 6 October at 2:48 pm in Gemini. Lunar apogee (furthest from Earth) follows on 10 October at 4:49 am and takes the Moon to 405394 km away from Earth, 20994 km further than normal, subtending an angle of 29.47 minutes of arc. The new moon appears on 14 October at 6:55 pm in Virgo beginning a new synodic (Lunar) month. The first quarter of the new cycle shows up on 22 October at 4:29 am in Sagittarius. Lunar perigee (closest to Earth) on 26 October at 4:11 am finds the Moon some 364894 km away from Earth, 19506 km closer than normal, subtending an angle of 32.74 minutes of arc. Late in the month, the full Hunter's Moon makes an appearance on 28 October at 9:24 pm in Aries.

For the inner planets, Mercury passes through superior conjunction—behind the Sun—in the second half of October so is mostly unobservable except for the first week when it will be bright at -1.1 mag but low in the eastern morning sky. Venus, however, reaches greatest western elongation on 24 October at 0:16 am and will be easily visible as a morning object, all month in the eastern sky, in Leo hovering around -4.7 mag. For the superior planets: Mars is a washout in the Sun's glare. Jupiter at -2.8 mag is visible all month long in Aries and the best time to observe it will be during the eclipse since it will be a few degrees east of the eclipsed Moon and appear to shine more brightly as the Moon fades. Saturn at 0.6 mag is best observed in the evening in Aquarius and is near the waxing gibbous Moon on 23–24 October. Uranus will be in Aries at the naked-eye limit at 5.7 mag, not far from Jupiter, whereas Neptune at 7.7 mag will require binoculars or a telescope but is well-placed for evening viewing in Pisces.

For 2-body conjunctions between solar system objects (defined as being less than 5 degrees apart), there are 2 that will be visible both involving Jupiter and the Moon. There are others but they are either washed out by the Sun or the objects fail to rise above the local horizon. The first Jupiter–Moon conjunction, early in the month and before the eclipse, will

peak on 2 October at 2:11 am when the Moon and Jupiter will be 3.15 degrees apart. The second Jupiter–Moon conjunction will be post-eclipse and occur on 29 October at 6:13 am and Jupiter will be bright but low in the west at 2.89 degrees from the Moon in twilight. An hour or two earlier would be better.

Shooting star watchers will have several opportunities as there are no fewer than 5 meteor showers of varying degrees of visibility but only 2, realistically, that might put on a show. The *Draconids*, radiant from the constellation *Draco* (The Dragon), will peak 8–9 October and result from the Earth passing through the debris of comet 21P/Giacobini-Zinner deposited during its last perihelion in September 2018. Look towards the star *Rastaban* in the head of the dragon, between the North Ecliptic Pole (NEP) and M92 on the skymap, in the evening and overnight hours. The *Orionid* meteor shower, radiant from the constellation *Orion* (The Hunter), will provide the best observing opportunity any time after 2 October, peaking on 21–22 October. At that time, a first-quarter Moon makes for good viewing so expect 10–20 meteors per hour (rising) in the very late evening and overnight. Look between the stars *Betelgeuse* on the shoulder of *Orion* and *Alhena* in the feet of *Gemini* (The Twins). The parent comet of the *Orionids* is the famous Halley's Comet.

Constellations visible in October include *Camelopardalis* (The Giraffe), *Pegasus* (The Winged Horse), *Andromeda* (The Chained Maiden), *Auriga* (The Charioteer), *Lacerta* (The Lizard), along with our circumpolar friends *Cassiopeia* (The Seated Queen), *Draco* (The Dragon), *Ursa Minor* (The Little Bear), *Cepheus* (The King). The pseudo-constellation known as the *Summer Triangle*—comprising the bright stars Vega in *Lyra* (The Lyre), Deneb in *Cygnus* (The Swan) and Altair in *Aquila* (The Eagle)—continues to fall deeper into the west.

Finally, don't forget to turn the clocks back as British Summer Time (BST) officially ends on 29 October at 2:00 am when the time becomes 1:00 am GMT.

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Edinburgh and Lothian Ephemeris

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|---------------------|---|-------------|
| 2 October 2:11 am   | Moon Jupiter 3.15° apart                  | Aries       |
| 6 October 2:48 pm   | Last quarter Moon                         | Gemini      |
| 8 October 8:00 pm   | Draconid meteor shower peaking over 9h    | Draco       |
| 10 October 4:49 am  | Lunar apogee at 405393.98 km              | Leo         |
| 14 October 6:55 pm  | New Moon, Meeus Lunation 294              | Virgo       |
| 15 October 2:11 am  | Moon crosses the descending node          | Virgo       |
| 20 October 6:38 am  | Mercury at superior conjunction           | Virgo       |
| 21 October 11:00 pm | Orionid meteor shower peaking over 7h     | Orion       |
| 22 October 4:29 am  | First quarter Moon                        | Sagittarius |
| 24 October 0:16 am  | Venus at greatest western elongation      | Leo         |
| 26 October 4:11 am  | Lunar perigee at 364894.31 km             | Aquarius    |
| 28 October 4:14 am  | Moon crosses the ascending node           | Pisces      |
| 28 October 9:14 pm  | Peak Lunar eclipse, 0.12 umbral magnitude | Aries       |
| 28 October 9:24 pm  | Full Hunter's Moon                        | Aries       |
| 29 October 2:00 am  | End of British Summer Time                | Virgo       |
| 29 October 6:13 am  | Moon Jupiter 2.89° apart                  | Aries       |
| 31 October 12:14 pm | Sun leaves Virgo and enters Libra         | Libra       |

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Edinburgh Lunar Eclipse Ephemeris (55.953°N, 3.188°W)

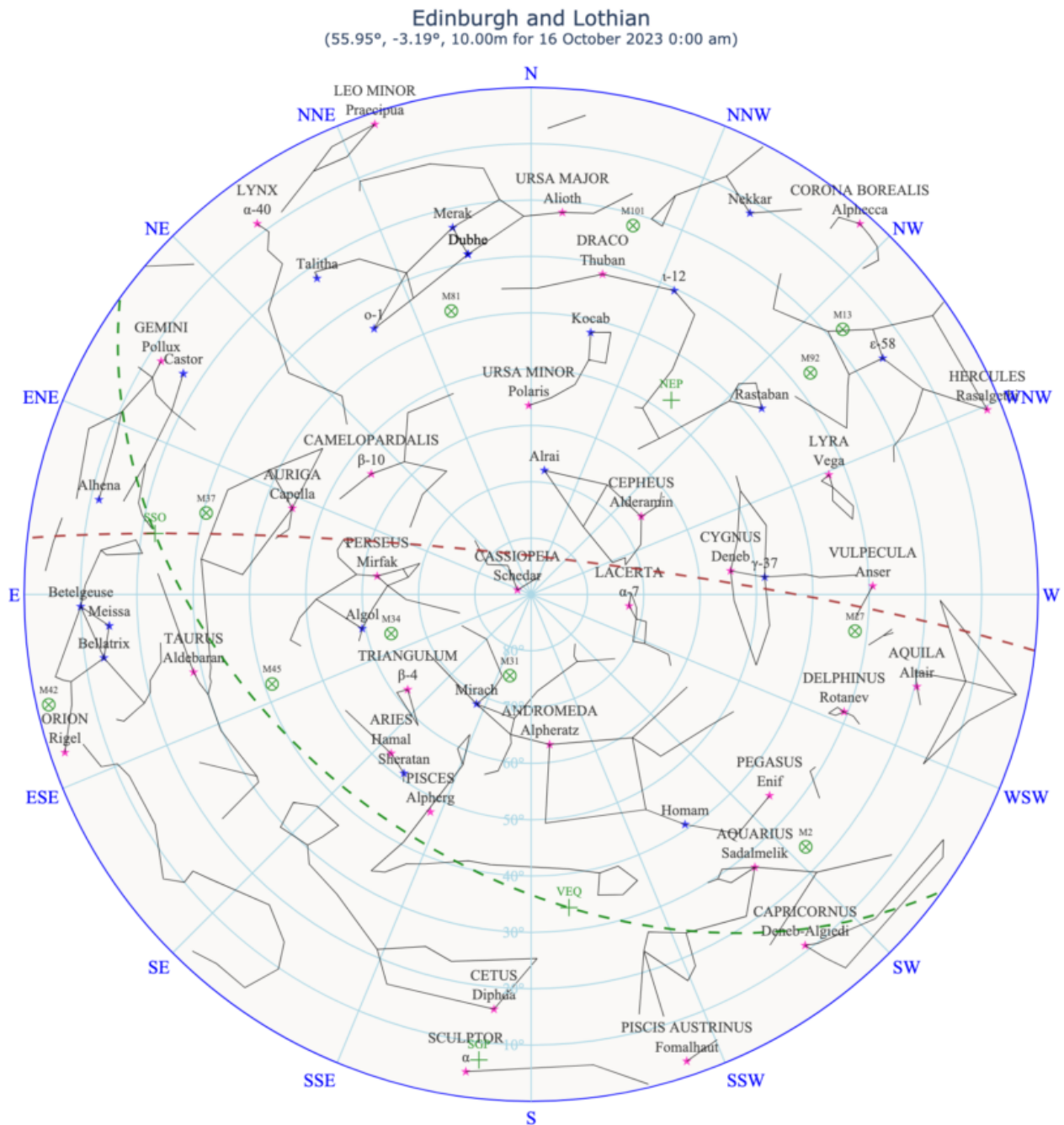
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|------------------------|--|-------|
| 28 October 7:01:48 pm  | Penumbra Eclipse Begins, penumbral magnitude +1.118    | Aries |
| 28 October 8:35:25 pm  | Partial Eclipse Begins                                 | Aries |
| 28 October 9:14:05 pm  | Peak Eclipse, umbral magnitude +0.1217, obscuration 6% | Aries |
| 28 October 9:52:40 pm  | Partial Eclipse Ends                                   | Aries |
| 28 October 11:26:25 pm | Penumbra Eclipse Ends, duration 4:24:37                | Aries |

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The sky above Edinburgh and Lothian at midnight on 15/16 October. The figure also applies at 1 am on 1 October and 10 pm on 30 October. The green, dashed, line is the Ecliptic and the brown, dashed, line is the Milky Way. Asterisms below 10 degrees may be truncated because of distortion. To use the map, face any direction and then rotate the map until that cardinal point is nearest to you. The zenith (point directly overhead) is at the centre of the circle and the edge is the horizon.