

# The astronomical sky over Edinburgh in March

**An equinox, a selenelion and the start of British Summer Time all occur in March. Plus, the devil's comet continues to brighten to naked-eye visibility.**

The headline grabbing astronomical event of March is, of course, the equinox. From the Latin 'aequus' meaning equal and 'nox' meaning night, the northern hemisphere vernal (spring) equinox is when the Sun crosses the celestial equator, travelling northwards, and occurs on 20 March at 3:06 am in Pisces. This is the magical moment when, broadly speaking, day equals night and the Sun rises directly in the east and sets directly in the west for everyone on Earth no matter where you live. We can anticipate many cultural festivals and ceremonies across the globe in celebration of this event.

On passing through the March equinox the Sun traverses the First Point of Aries. This is the zero-point of the astronomical co-ordinate system but it isn't static: it moves in time. So, the First Point of Aries is now in Pisces (The Fishes) and has been since 70 BCE. Today we can calculate that the First Point of Aries will enter Aquarius in the year 2597 and will not return to Aries until around the year 23315!

Yet we get ahead of ourselves for the Sun starts the month in Aquarius and enters Pisces on 11 March at 5:54 pm. Daylight lengthens from 10:45 (10.747 hours) on 1 March to 13:05 (13.081 hours) on 31 March so we lose 2 hours and 20 minutes of night time by the end of March. Let's not forget, also,

that British Summer Time (BST) starts on 31 March at 1 am and the clocks go forward by 1 hour.

Mercury becomes visible as an evening object starting after sunset on 14 March at -1.2 mag in Pisces. Although low in the sky ( $5^\circ$  altitude in the west) it is 174 million km from Earth. Some 3 days later, it also reaches perihelion (closest to the Sun) at 44 million km. By 20 March, it gets closer to the Earth at 151 million km but, contrarily, fades in magnitude to -0.6 mag because the fractional area of the planet's (apparent) disk illuminated by sunlight has decreased. On 23 March at 3:52 pm, Mercury reaches dichotomy when exactly half the planet's surface is illuminated by the Sun. Finally, on 24 March it reaches greatest eastern elongation (furthest angular distance from the Sun) at  $18.7^\circ$ . Venus, meanwhile, recedes from both the Earth and the Sun. Indeed, it reaches aphelion (furthest from the Sun) on 19 March at 9:48 pm when it is 109 million km away. In March, it is a daytime object rising within civil dawn every day and so is lost in the Sun's glare.

Mars, also, remains a daytime object too close to the Sun so remains unobservable. Jupiter dims slightly from -2.2 to -2.1 mag as it recedes from the Earth by some 58 million km. It is highly visible in Aries after astronomical (evening) twilight, all month long, for several hours but sets before midnight. On 13 March at 10:47 pm, it conjuncts with the waxing crescent Moon being separated by  $3.3^\circ$ . Since Saturn's conjunction last month, it is unsurprising that it remains lost in the Sun's glare (as a daytime planet). Uranus still follows Jupiter very closely in the night sky and sets about an hour after the giant gas planet. However, as a thought experiment: imagine you were a resident of Uranus with access to a superb telescope ... why? Then, you could observe a transit of Mercury across the Sun on 13 March at 3:07 pm! Alas, Neptune is also a daytime planet and hides behind the Sun on 17 March at 10:31 am when it is in conjunction. A day later and it reaches its furthest distance from the Earth all year at 4.6 billion km.

The Moon enters last quarter on 3 March at 3:23 pm in Scorpio. Lunar perigee (closest to Earth) on 10 March at 6:59 am finds the Moon some 356,895 km away from Earth—around 27,505 km closer than average—subtending an angle of 33.5 arcminutes. The new Moon appears on 10 March at 9:00 am in Aquarius beginning a new synodic (Lunar) month. The first quarter of the new cycle shows up on 17 March at 4:11 am in Taurus. The waxing gibbous Moon conjuncts with Regulus in Leo (The Lion) on 22 March at 4:46 am as both set. Lunar apogee (furthest from Earth) occurs on 23 March at 3:32 pm and takes the Moon to 406,306 km away from Earth—around 21,906 km further than average—subtending an angle of 29.4 arcminutes. The full Worm Moon makes an appearance on 25 March at 7:00 am in Virgo.

The prominent event in this month's Lunar calendar is a penumbral eclipse on 25 March. This occurs when the Moon passes through the Earth's partial shadow. The double whammy for Edinburgh and Lothian, however, is that the eclipse begins between nautical and civil twilight and when the Moon is setting. Being so low on the horizon, starting around 10° altitude in the west-south-west, the eclipse maximum occurs after moonset. Sunrise at 6 am will also hamper observing but since both the Sun and Moon will be above the horizon at the same time, this is called a selenelion. Still, the eclipse starts at 4:53 am and for the first hour you should see something as the lunar surface darkens.

For comets, you might catch a glimpse, through binoculars or a telescope, of C/2021 S3 PanSTARRS as it reaches closest approach to Earth at 194 million km. It will be at 26° altitude, south-east, in Serpens Cauda (The Serpent's Tail) on 15 March at 4 am around 7.2 mag.

The devil's comet though, known formally as Comet 12P/Pons-Brooks, should be visible with the naked eye by the end of the month. Our skymap is tailored to 8 pm mid-month so this can aid us in finding the comet. On 1 March at 8 pm, it can be

found in Andromeda (The Chained Maiden) shining at 7.3 mag and 252 million km from Earth. A week later it gains 0.5 mag in brightness and comes 4 million km closer to Earth, 13 million km closer to the Sun. On the 13 March, still in Andromeda, at 8 pm it will be  $1.5^{\circ}$ N of the star  $\delta$ -31 at 6.4 mag. On 22 March at 8 pm, it can be found  $3^{\circ}$ S of M33 (the Triangulum Galaxy) at 5.6 mag having crossed into Pisces. By 30 March, at 241 million km from Earth and brightening to 5.2 mag (6.3× brighter than the start of the month) it should be visible with the naked eye (at a reasonably good site)  $1^{\circ}$ W of Hamal, the principal star in Aries. Once the devil's comet passes perihelion next month, it will not return for 71.3 years so, perhaps, take an evening stroll on Arthur's Seat to see it without optical assistance?

The phenomena known as the 'zodiacal light' is visible during March. Caused by sunlight scattered off inter-planetary dust, it appears as a diffuse triangular glow extending from the Sun along the ecliptic. It may be observed in the western spring sky after sunset.

At the time of our sky map, some constellations visible are Orion (The Hunter), Monoceros (The Unicorn), Bo ötes (The Herdsman) and Cepheus (The Seated King). The ecliptic hosts Virgo (The Maiden), Leo (The Lion), Cancer (The Crab), Gemini (The Twins) and Taurus (The Bull), Aries (The Ram) and Pisces (The Fishes). Two fake constellations are visible in the south-west: the 'Winter Triangle' (Sirius, Betelgeuse, Procyon) and the 'Winter Hexagon' (Rigel, Aldebaran, Capella, Pollux, Procyon and Sirius).

Circumpolar constellations—always above the horizon—include Cassiopeia (The Seated Queen), Draco (The Dragon), Ursa Minor (The Little Bear), Ursa Major (The Great Bear) and Cepheus (The King).

If you are up for a challenge in March, and own decent binoculars or a modest telescope, consider completing

the Messier Marathon. Around 9 March, all Messier objects can be observed within a single night—the Messier Marathon—for latitudes 20°–50°N so Edinburgh and Lothian is just on the edge. Even if you don't complete the marathon but knock-off, say, over 100 you can claim to be an advanced Messier Bagger!

Edinburgh and Lothian Ephemeris		
1 March 8:00 pm	12P/Pons-Brooks 23° alt, 7.3 mag	Andromeda
3 March 3:23 pm	Moon at last quarter	Scorpio
4 March 9:34 pm	Juno at opposition	Leo
8 March 8:00 pm	12P/Pons-Brooks 23° alt, 6.8 mag	Andromeda
10 March 6:59 am	Lunar perigee 356,895 km	Aquarius
10 March 9:00 am	New Moon, Meeus lunation 299	Aquarius
11 March 5:54 pm	Sun leaves Aquarius, enters Pisces at 0.994 AU	Pisces
12 March 1:17 am	Moon crosses ascending node	Pisces
13 March 8:00 pm	12P/Pons-Brooks 1.5°N of $\delta$ -31, 6.4 mag	Andromeda
13 March 10:47 pm	Jupiter 3.3°S of waxing crescent Moon	Aries
15 March 4:00 am	C/2021 S3 PanSTARRS closest to Earth, 7.2 mag	Serpens Cauda
17 March 4:11 am	Moon at first quarter	Taurus
17 March 10:31 am	Neptune at conjunction with Sun	Pisces
17 March 4:39 pm	Mercury perihelion 46,000,462 km	Pisces
18 March 7:54 am	Earth Neptune closest all year at 4,622,100,027 km	Pisces
19 March 9:56 pm	Venus aphelion 108,938,633 km	Pisces
20 March 3:06 am	Vernal equinox	Pisces
22 March 4:46 am	Regulus 3.6°S of waxing gibbous Moon	Leo
22 March 8:00 pm	12P/Pons-Brooks 3°S of M33, 5.7 mag	Pisces
23 March 3:32 pm	Lunar apogee 406,306 km	Leo
23 March 3:52 pm	Mercury at dichotomy	Pisces
24 March 10:35 pm	Mercury at greatest eastern elongation	Pisces
25 March 7:00 am	Full (Worm) Moon	Virgo
25 March 4:53 am	Lunar penumbral eclipse begins, Saros Series 113	Virgo
25 March 6:03 am	Lunar penumbral eclipse maximum 0.96 mag	Virgo
25 March 6:13 am	Moon sets (during eclipse)	Virgo
25 March 9:32 am	Lunar penumbral eclipse ends after 4h 39m	Virgo
26 March 4:08 am	Moon crosses descending node	Virgo
30 March 8:00 pm	12P/Pons-Brooks 1°W of Hamal, 5.2 mag	Aries
31 March 1:00 am	British Summer Time (BST) begins	Pisces

Edinburgh and Lothian  
(55.95°, -3.19°, 10.00m for 16 March 2024 8:00 pm)

