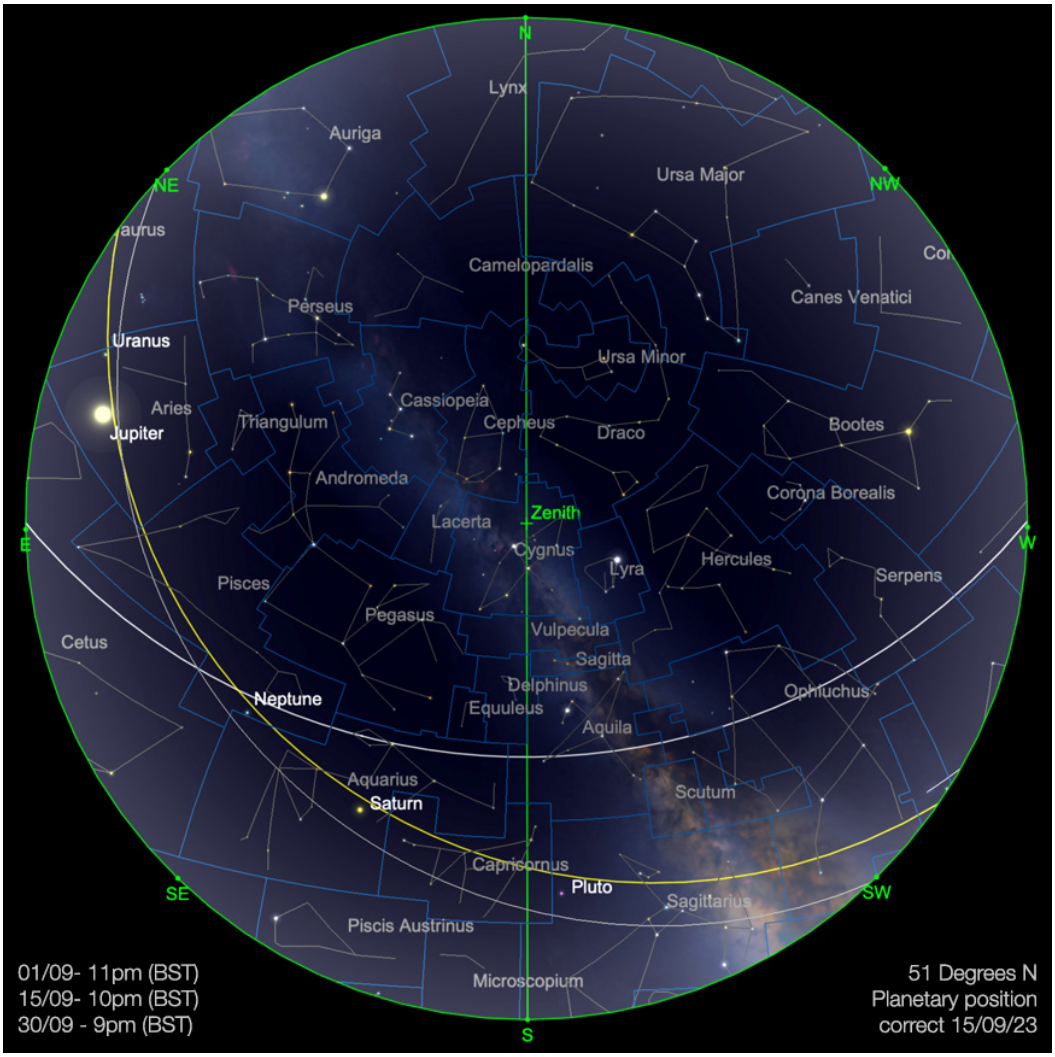
Telescope House Hosted by Bresser UK September 2023 Sky Guide



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September heralds the Autumnal Equinox in the Northern Hemisphere and the Spring Equinox for those in the Southern Hemisphere. This year, these phenomena take place on September 23rd, a day when, briefly, day and night approach equal durations. The term “Equinox” has its roots in Latin, with “Equi” denoting equal and “Nox” meaning night. However, the true balance of day and night on this date varies based on one's location; there are limited spots on Earth where the 23rd of September witnesses a genuine equilibrium. Importantly, September 23rd signifies the moment the Sun transitions into the southern celestial hemisphere. This leads to longer nights in the Northern Hemisphere and shorter ones in the Southern Hemisphere. While many who don’t particularly delve into astronomy might lament the diminishing daylight in the Northern Hemisphere, enthusiasts who follow this Sky Guide likely view it differently. For those of us stargazing in the upper Northern latitudes, the descent into winter brings its own rewards.

As ever, there's a lot to see in skies above us this month...

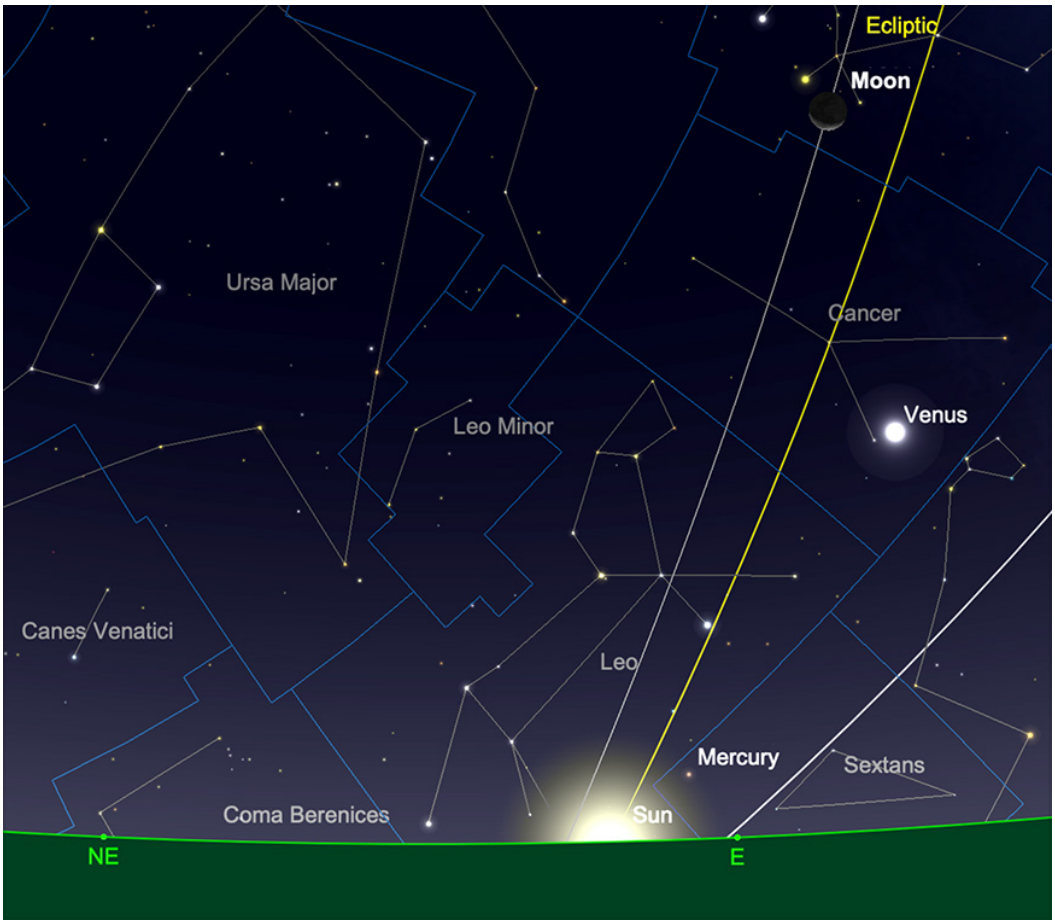
The Solar System

The Moon

As August was a month which featured a so-called Blue Moon (two full Moons in one calendar month), we begin September with the Moon at just past Full phase. A resident of the zodiacal constellation of Pisces, the Moon rises on the evening of the 1st at just before 9 pm (BST). Common sense dictates (though we will mention it anyway) that the beginning and ending of September will not be the most prime opportunities for observing, fainter deep sky targets, due to the well-illuminated Moon’s presence throughout the night. The moon will transit at just past 3 am (BST), the following morning, and will be flanked to the west by Neptune and Saturn and higher to the east, by Jupiter.

The next couple of days finds the Moon tracking through Pisces into Aries, where it will have a reasonably close encounter with Jupiter on the evenings of the fourth and fifth. The following evening, 6th September, finds the Moon at Last Quarter in Taurus, after which, the moon will begin to descend towards the Sun, displaying a crescent phase. This time of year, is analogous to the Moon’s “High Spring Crescent phases” of springtime. But instead of the Moon appearing high in the sky at crescent phase in the evenings, at this time of year, due to the acute rising angle of the ecliptic plane, the Moon’s separation from the horizon in the northern hemisphere in the morning sky approaches maximum and leads to extremely favourable conditions for observation.

As the Moon crests over the “top“ of the northern ecliptic, through the constellations of Gemini and Cancer over the next couple of days, the rapidly diminishing crescent appears to almost lie “on its back” in relation to the horizon. This view of the Moon is commonly enough seen from the equatorial and tropical regions of the planet, where the ecliptic plane tends to run almost right overhead, but much more of a rarity for those of us resident in higher latitudes. Ancient cultures often referred to this view of the Moon as “boat-like“. The most famous example of this is the Egyptian legend of the sacred moon-boat of the scribe god Thoth. When the Moon appeared in the sky “on its back” in crescent phase, it was said that this was Thoth going about his heavenly perambulations in his boat.



The Moon at sunrise, 10th September. Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

The Moon crosses over the border into Leo on the morning of the 12th September and can be found almost in line with the dazzling planet Venus at sunrise. By this time, the moon will be displaying a 6.9% illuminated crescent phase and will be progressively more difficult to find in the sky closer to dawn.

The Moon comes to New phase as it joins the Sun on the Leo/Virgo borders on 15th September. After which it will re-emerge as an evening target. The minute Lee illuminated crescent moon will pass the diminutive Mars in the early evening sky on September 16th. However, this conjunction will be unlikely to be witnessed by many – if any - observers, due to the proximity of both bodies to the Sun and the horizon.

The next few days will find the moon traversing further eastwards, through the wide expanse of Virgo, into Libra and Scorpius, until it reaches First Quarter in Sagittarius on the evening of the 22nd. Just as the Moon's morning crescent phase appears high in the sky at this time of year for northern hemisphere observers, the evening crescent phase appears very low in the sky. This relatively poor separation from the horizon of the evening crescent moon at this time of year will naturally have consequences for seeing conditions for those with telescopes. While always encouraging those with telescopes to make the

most of observing our natural satellite, we advise to keep magnification sensibly low, in order to preserve the quality of view. The closer an object is to the horizon, the more one does battle with air currents and truncation of the atmosphere, leading to poor visibility and the larger the aperture of Telescope you have, the more efficiently it will resolve atmospheric turbulence. When you look at the Moon through a telescope in the northern hemisphere, at this time of the month, you'll see what we mean!

The Moon then begins to climb out of the most suddenly part of the ecliptic, passing through Sagittarius Capricorn us and own into Aquarius, where it will meet Saturn again on the evening of the 26th.

The Moon becomes Full on the Aquarius/Pisces borders on the 29th and ends the month the next evening on the Aries/Pisces borders, a little to the west of the very prominent Jupiter.

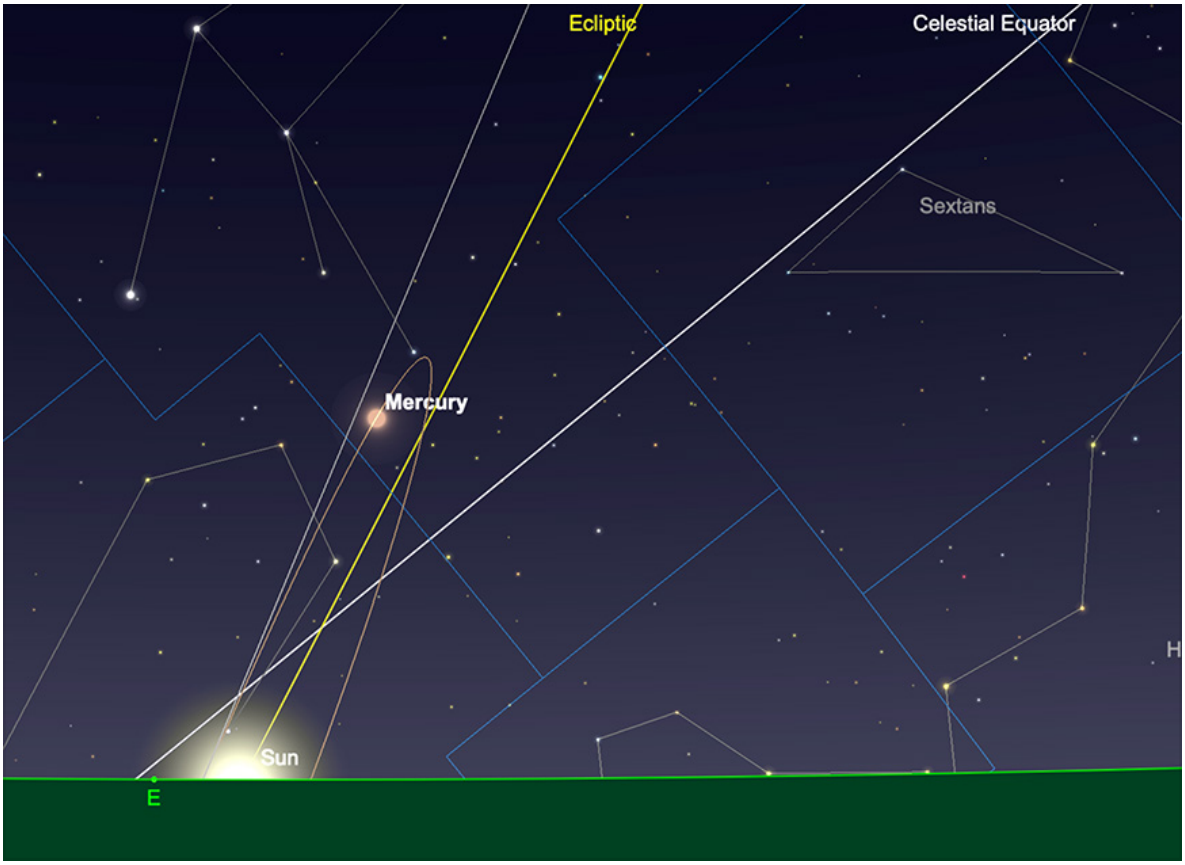
Mercury

Mercury begins September in a poor position and unobservable for northern hemisphere observers. The solar system's smallest true planet is headed sunward and reaches inferior conjunction on 6th September.

As with anything Mercury-related, we don't have to wait too long for the situation to change from the dire, to the very much more favourable. As mercury reemerges from the Sun into the morning sky from the latter part of the month, it becomes observable and rapidly brightens. As we mentioned in regards to the Moon in the morning sky, the area of the ecliptic (Leo) that Mercury finds itself in it present, rises at a very steep angle for observers in the northern hemisphere. This increases the separation of Mercury from the horizon, leading to a very favourable morning apparition. By the time mercury reaches maximum western elongation from the Sun on September 22, it will stand over 15° high due east at daybreak (from 51° north). By this time, the planet will be a visual magnitude of -0.3 and display a 7.2 arc second diameter disc, illuminated by just over 47%.

The next few days sees Mercury climbing in visual magnitude, as pulls further around its orbit and increases its illumination, as seen from Earth.

By the time we get to the end of the month on the morning of the 30th, Mercury will be -1.0 magnitude and stand an altitude of just over 13° high (again, as observed from 51° north), as the Sun rises. This apparition of Mercury in the morning is one of the most favourable of the year, so those early risers are encouraged to make the most of it.



Mercury at sunrise, 30th September. Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

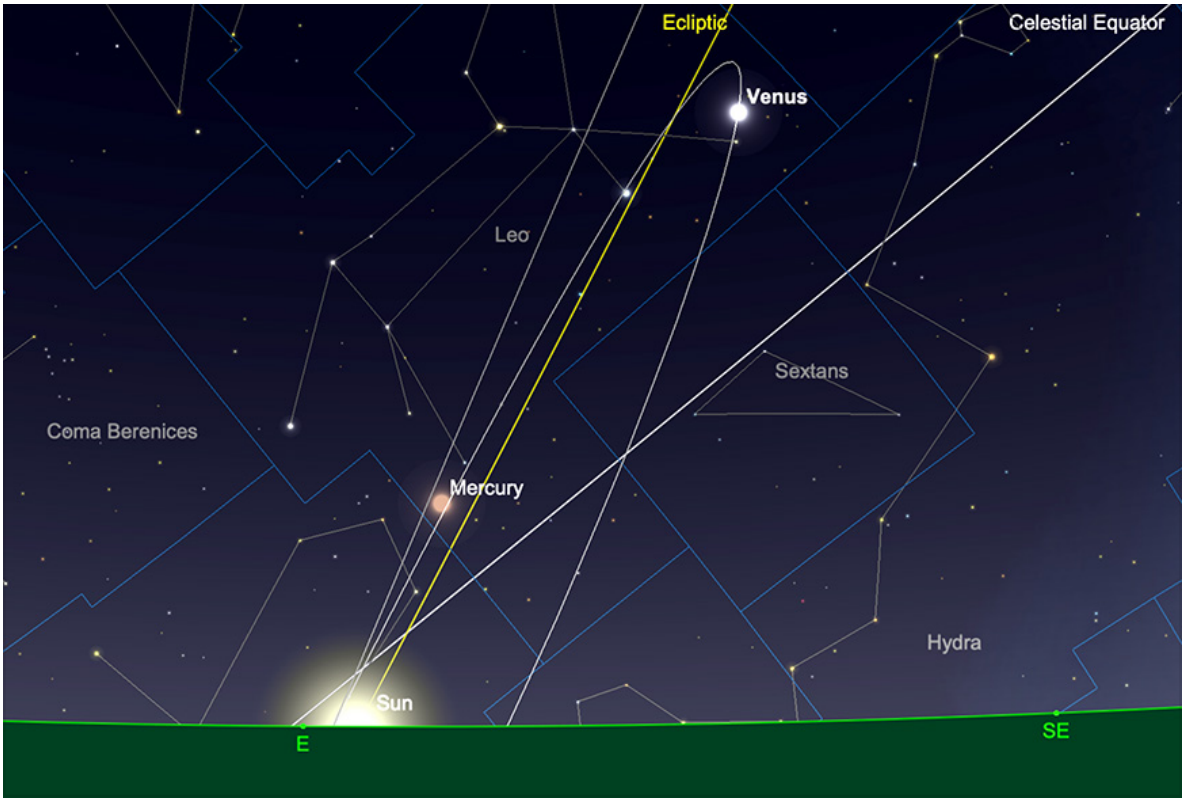
Venus

Venus has emerged rapidly from mid-August's inferior conjunction and starts September as a resident of Cancer. A morning target, or nearest neighbour presents a visual magnitude of -4.4 and displays an 11% illuminated disc, of just under 50 seconds diameter. Venus will stand just under 18° high in the east as the Sun rises on the morning of the 1st (as observed from 51° north).

Venus has a much wider orbit than Mercury, and as a consequence, makes its way through the skies at a much more leisurely pace. By mid-month, the planet will have increased its illumination to just under 24%, but will have shrunk somewhat to just over 40 orc seconds diameter. However, despite shrinking inside, Venus has gained slightly in brightness from the month's beginning and is now -4.5 magnitude. The reason for this increase in brightness, despite the planet's apparent shrinking in size, is that its illuminated area is slightly larger at this point in time than it was at the beginning of September.

By the time we reach the end of the month, Venus has remained static in brightness at dazzling -4.5 magnitude, while decreasing size to just over 32 arc seconds diameter. The planet is now illuminated by around 36%, which means

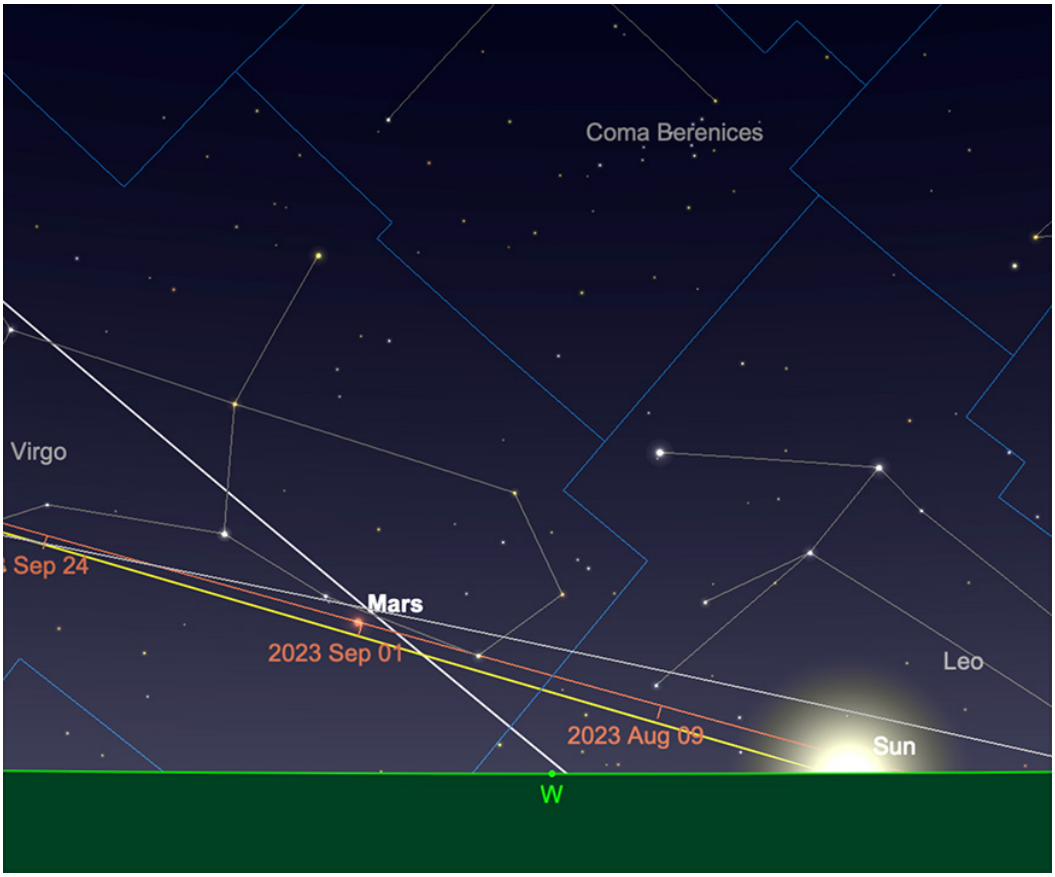
that its illumination area increase has kept pace - and indeed balanced out - its decrease in size.



Venus at sunrise, 30th September. Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

Mars

As mentioned previously, Mars is an incredibly disappointing target at present. On the evening of the 1st of September, Mars is to be found in Virgo at a magnitude of +1.7 and an apparent size of just 3.8 arc seconds. As Mars is situated in a very shallow setting part of the ecliptic, at present, it is very easily lost in the glare of dusk.



Mars at sunset, 1st September. Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

As the month progresses Mars tracks closer to the Sun, decreasing any chance of finding it in the evening sky significantly. Amazingly, the Red Planet is, at the end of September, still over a month and a half away from superior conjunction (the opposite side of the Sun, as seen from Earth). It will be sometime after reemerges from this before it is a worthwhile target for observation again.

Jupiter

Where is Mars is languishing at present, Jupiter is brightening in anticipation of early November's opposition and arguably the planetary highlight at present. The planet is currently to be found in Aries at a magnitude of -2.6 and an apparent size of 44 arc seconds, as seen on the morning of the 1st.
Jupiter will rise at a little after 10 pm on the evening of the first, transiting at a little before 5:30 am and setting at just before 1 pm the following afternoon (all times, BST).

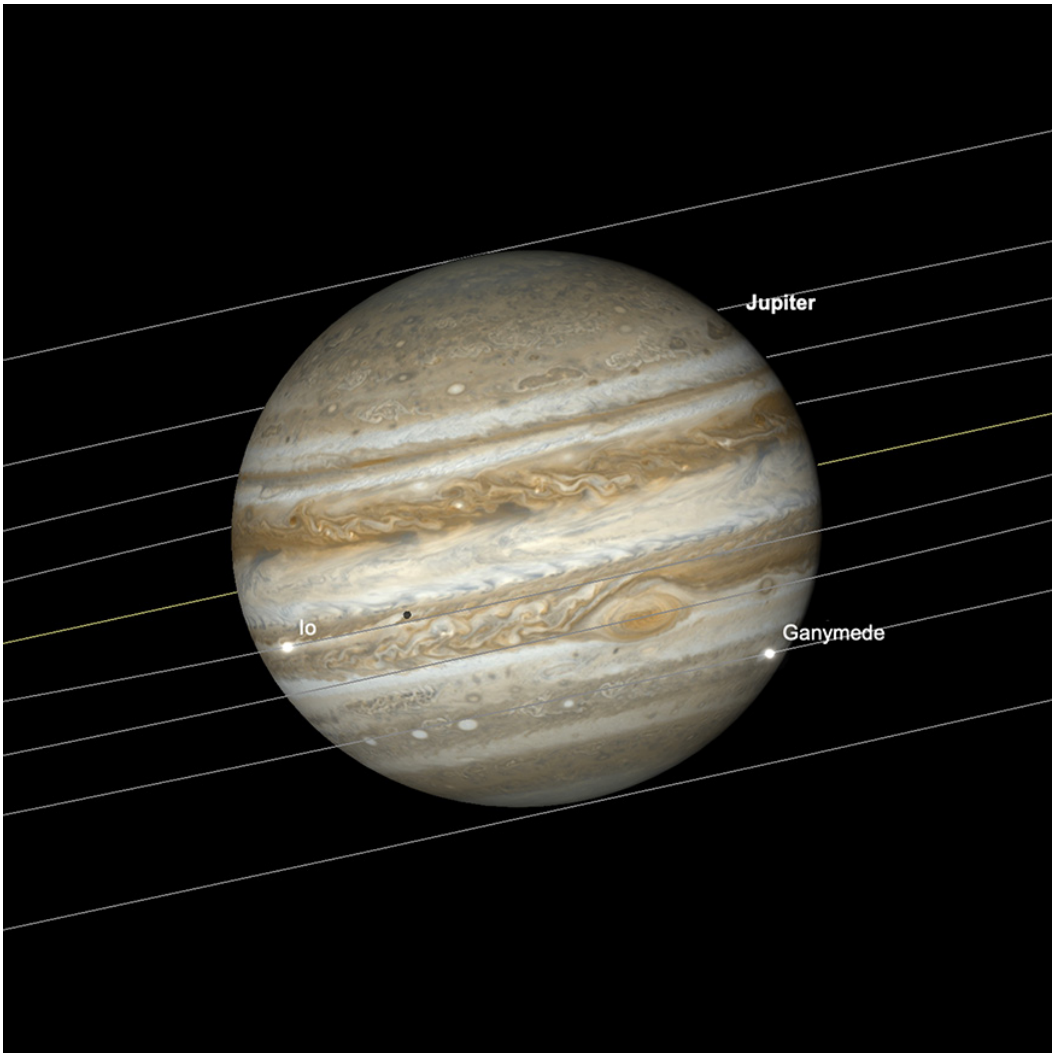
As the planet is now firmly a northern celestial hemisphere target, it's presents those of us in the northern hemisphere with a very favourable opportunity for observation. At transit point on the 1st (5.26am BST), the planet stands over 54

1/2° high due South (as seen from 51° north). This separation from the horizon is significant, as it puts the planet in an area of sky that is much less unencumbered by atmospheric turbulence and truncation. Naturally, this only applies to northern hemisphere observers. Those observers in the higher latitudes of the southern hemisphere have had the benefit of Jupiter in a favourable position for them for the past six years, but solar system dynamics now favour us “northerners”. However, it’s worth mentioning that for observers in the equatorial and tropical regions of the Earth, this Jovian hemispherical change is somewhat moot, as the ecliptic tends to run close to overhead throughout the year.

Jupiter reaches static point in the sky around early September (4/5th) and afterwards begins its retrograde path through the sky, which outer planets always do in anticipation of opposition. We’ve covered the mechanics of retrograde motion in previous sky guides, but for those unfamiliar with the situation, this is where a planet appears to move “backwards” in its path through the sky. This is not because the planet has reversed direction, rather that the Earth has “caught up“ with the outer planets position in the solar system, on its faster interior orbit, making the outer planet appear to move backwards in relation to its “proper motion“ through the sky. The easiest analogy to use is that of occupants in a car moving overtaking another car. The car that has been overtaken would appear to move backwards from the perspective of the occupants in the overtaking car, even though both cars are headed in the same direction. This is a rather simplified - but effective - way of describing retrograde planetary motion.

By the time we get to mid-month, Jupiter has increased its brightness to -2.7 magnitude and now displays an apparent size of just under 46 arc seconds. The planet will now rise as a little after 9 pm, transiting at around 4:30 am and sitting at just before noon, the following afternoon.

Fast forward towards the end of the month and Jupiter has gained fractionally again in brightness to -2.8 magnitude and now displays a 47.6 arc second diameter disk. The planet will now rise at around 8 pm, transiting at a little before 3:30 am the following morning and setting a little before 11 am (again, all times BST).



Jupiter with Great Red Spot, Io and Ganymede Transits, 29th September, 1.16am. Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

For those up early enough, there are some Jovian transit highlights to observe from Europe during September (all times BST):

On September 9, sees a Great Red Spot (GRS) and grazing transit of Jupiters South Pole by Callisto, peaking around 6:16 am. Callisto transits are fairly rare at present, as the moon is the furthest orbit out of Jupiter's Galilean satellites (orbiting it once every 16.69 days) and its orbit barely intersects the Jovian disk currently.

September 13, finds a mutual GRS and Io transit, with both transits visible at around 6:16 am.

September 19 find a decent mutual GRS and Europa transit peaking at around 1:15 am.

September 22 sees a mutual GRS, Io and Io shadow transit, peaking at around

12:15 am.

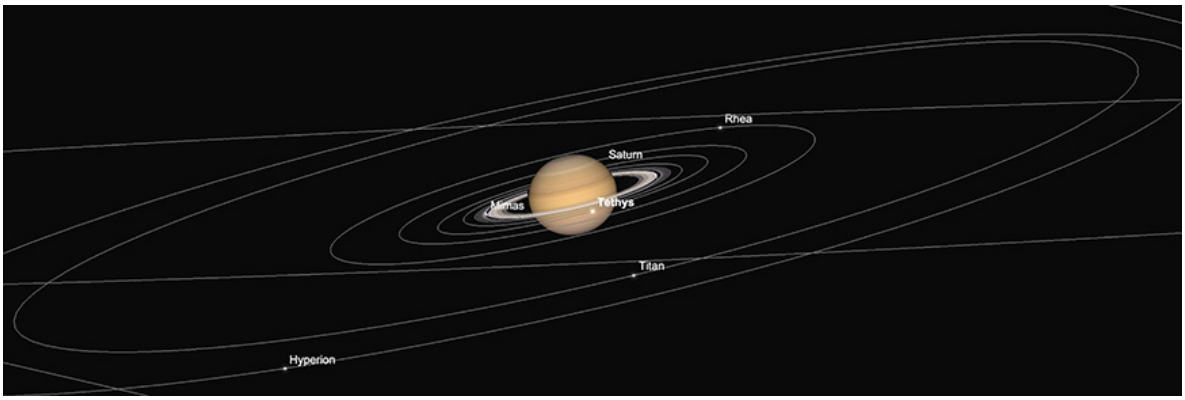
September 26, sees a GRS, Europa and Europa shadow transit peaking at around 2:15 am.

September 29 at around 1:16 am sees a transit of Io, the GRS and Ganymede.

Saturn

At just past opposition (reached on August 27th), Saturn is ideally, placed for observation throughout the night. Currently found in the constellation of Aquarius, Saturn presents a visual magnitude of +0.4 and an apparent size of 19 arc seconds across at the month's beginning. Saturn rises at just before 8 pm on the 1st, transits a little before 1 am the following morning and sets at around 6 am.

The early morning of the 1st also sees an interesting Saturnian transit event, when the moon Tethys moves in front of Saturn's disk. Transits of Saturn's moons are a much more challenging event to observe than those of Jupiter's Galilean satellites. You will need a telescope of probably around 10 inches in aperture as a minimum and it is much more likely that you will see the shadow of the moon's transit, rather than the moon itself against Saturns atmosphere. Conditions will have to be very clement and the atmosphere extremely steady to make observations of this sort. However, the morning of the first see Saturn at a reasonable altitude above the horizon and while it would require an alignment of favourable circumstances and pretty healthy magnification, for those with the prerequisite equipment, observing skill, and patience, is not impossible.



Saturn and major moons, including Tethys Transit, 1st September, 1am. Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

By the time we get to mid September, Saturn will have faded very fractionally to a visual magnitude +0.5. The planet will rise at a little before 7 pm and transit at just before midnight. It will set around 5 am the following morning.

At the end of the month, Saturn will faded a little further 2+0.6 magnitude and now displays and 18.6 ox second diameter disc. The planet rises a little before 6 pm, transiting at a little before 11 in the evening and sitting at just before 4 am the following morning. Post-opposition is always the most favourable time for observation of an outer planet in the evening and we are heading towards this window of observational opportunity as far as Saturn is concerned. Anyone with a telescope is thoroughly encouraged to make the most of this opportunity. Like Jupiter, Saturn is now rising from the doldrums of the southern part of the ecliptic, which it has occupied for the best part of a decade now. While it is nowhere near as high in the sky as its neighbour, Jupiter, the trend for northern hemisphere observation is definitely upwards as far as Saturn is concerned. Standing just under 27° high at transit point on the 30th, Saturn presents a very reasonable target for northern hemisphere observers. Time spent at the eyepiece observing Saturn is rarely wasted - so make the most of it.

Uranus and Neptune

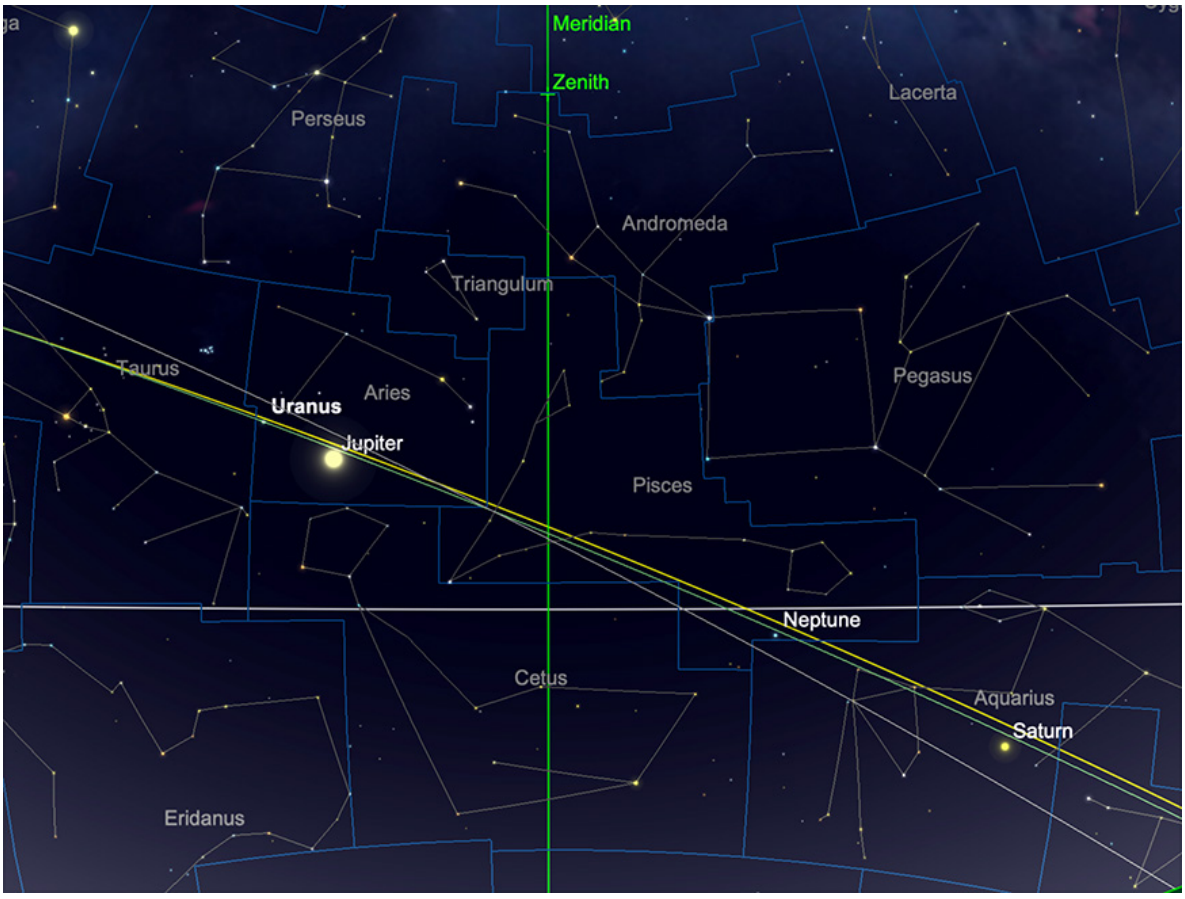
Of the two out gas giants, the focus is predominantly on Neptune this month, as it comes to opposition on 19th September. In truth, oppositions of both outer worlds, never result in a massive boost in brightness, as they are both so far away from us here on Earth, even at the best of times. The 19th will find Neptune a resident in Pisces at a visual magnitude of +7.8 and displaying a disc of 2.4 seconds diameter.

Neptune was first identified through mathematical prediction. While Galileo observed Neptune near Jupiter in 1612 and 1613, he mistook it for a star. After Sir William Herschel's discovery of Uranus in 1781, anomalies in the observation of the planet’s orbit hinted at another distant planet, further out in the icy reaches of the solar system. English astronomer John Couch Adams and French mathematician Urbain Le Verrier separately calculated its potential location. Their predictions, initially overlooked, were later recognised for their accuracy. However, due to outdated star maps and communication issues, Neptune was observed, but not identified by the British. Meanwhile, Le Verrier shared his predictions with the Berlin Observatory. Resident Astronomers Johann Galle and Henrich d’Arrest found Neptune within an hour of searching on 24th September 1846, very close (within a degree) of Le Verrier’s predicted location.

Neptune’s prominent blue colouration is often remarked upon. When you find it

in a telescope, or larger binoculars, it is faint, but pretty unmistakable, often being described as looking akin to a planetary nebula itself. Around opposition gives us the best opportunity to observe the solar system's (current) last "true" planet.

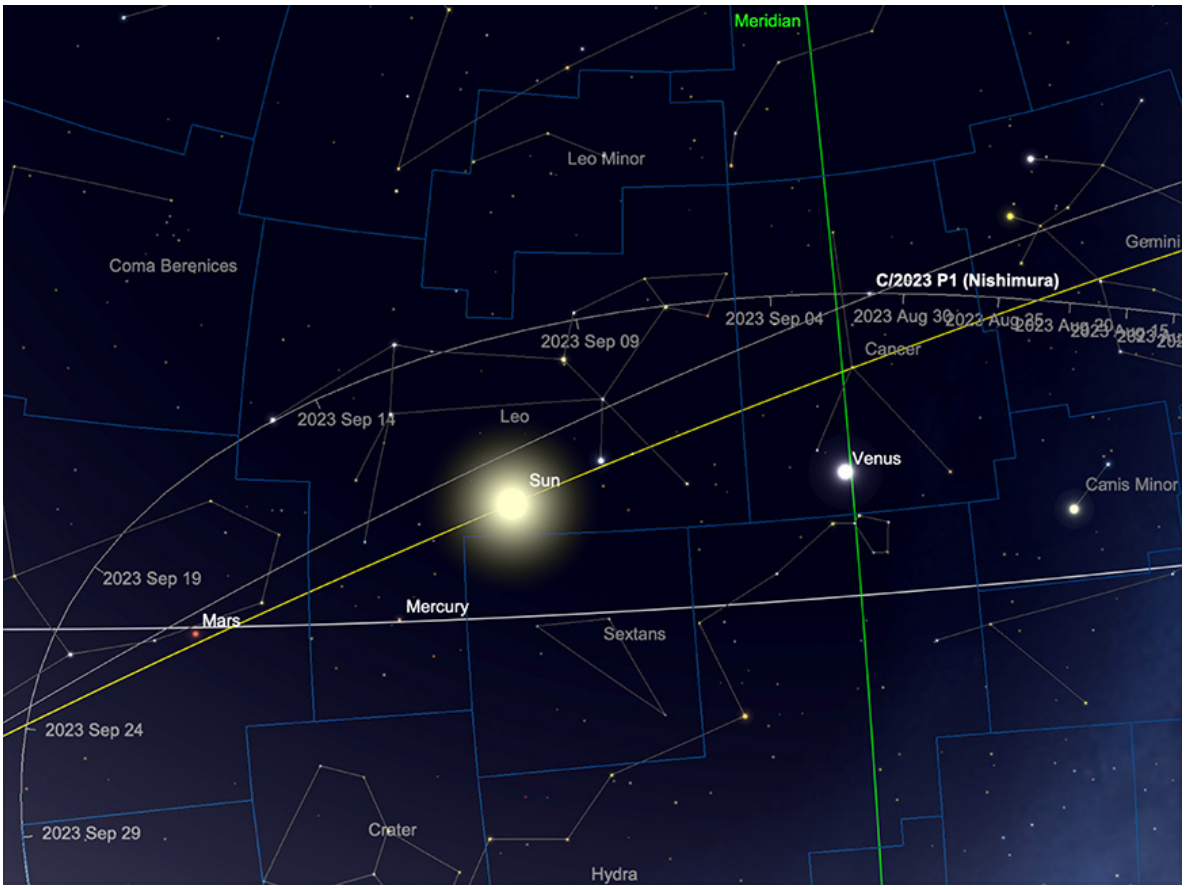
Further east in the ecliptic, lies Neptune's neighbour, Uranus. A resident of Aries currently, the prominent planet, Jupiter situated around seven and three-quarter degrees to the west of Uranus acts as a handy signpost for its location. At +5.7 magnitude, Uranus is technically a naked eye object, but is much easier to find in binoculars. Its greeny-grey disc, again, looks quite similar to a brighter planetary nebula and at 3.7 arc seconds diameter it is similar in size to many. Given a significantly large telescope (usually 12 inches or above in aperture), it is possible to visually observe some striation on Uranus' disk, during times of good seeing. Experienced observers have managed to glimpse some subtle albedo features with smaller telescopes, but have doubtlessly been extremely patient and methodical in their observation techniques. As Uranus is now the most northerly of all the planets in the sky, northern hemisphere observers are encouraged to make the most of its position. As Uranus transits during September, it will stand around 57 1/2° above the horizon (as seen from 51° north).



Uranus and Neptune relative positions, mid-September. Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

Comets

A newly-discovered comet, C/2023 P1 (Nishimura) has been causing some speculation and it looks like it may be observable during September. Very early in the month, the comet may be observable in the early morning sky, predawn. However, it will loop north of the Sun around mid-September and will likely be unobservable during this period - unless something remarkable happens. Once the comet reemerges from the Sun's glare in the latter half of the month, it will be an evening target. Current peak magnitude predictions put it as high as second magnitude, though this is likely to occur when the comet is very close to the Sun, making it very difficult to observe. Still, this is an interesting object and we encourage those up early enough in the early part of the month to see if they can find it using larger binoculars. The comet may be easier to observe post-perihelion in the latter part of the month, but it remains to be seen exactly how this comet will manifest itself.



Comet C/2023 P1 (Nishimura) path during September (comet position shown 1st September). Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

We still have the potential of comets, C/2021 S3 and C/2023 A3 to look forward to, but it will really be 2024 before either are at their best.

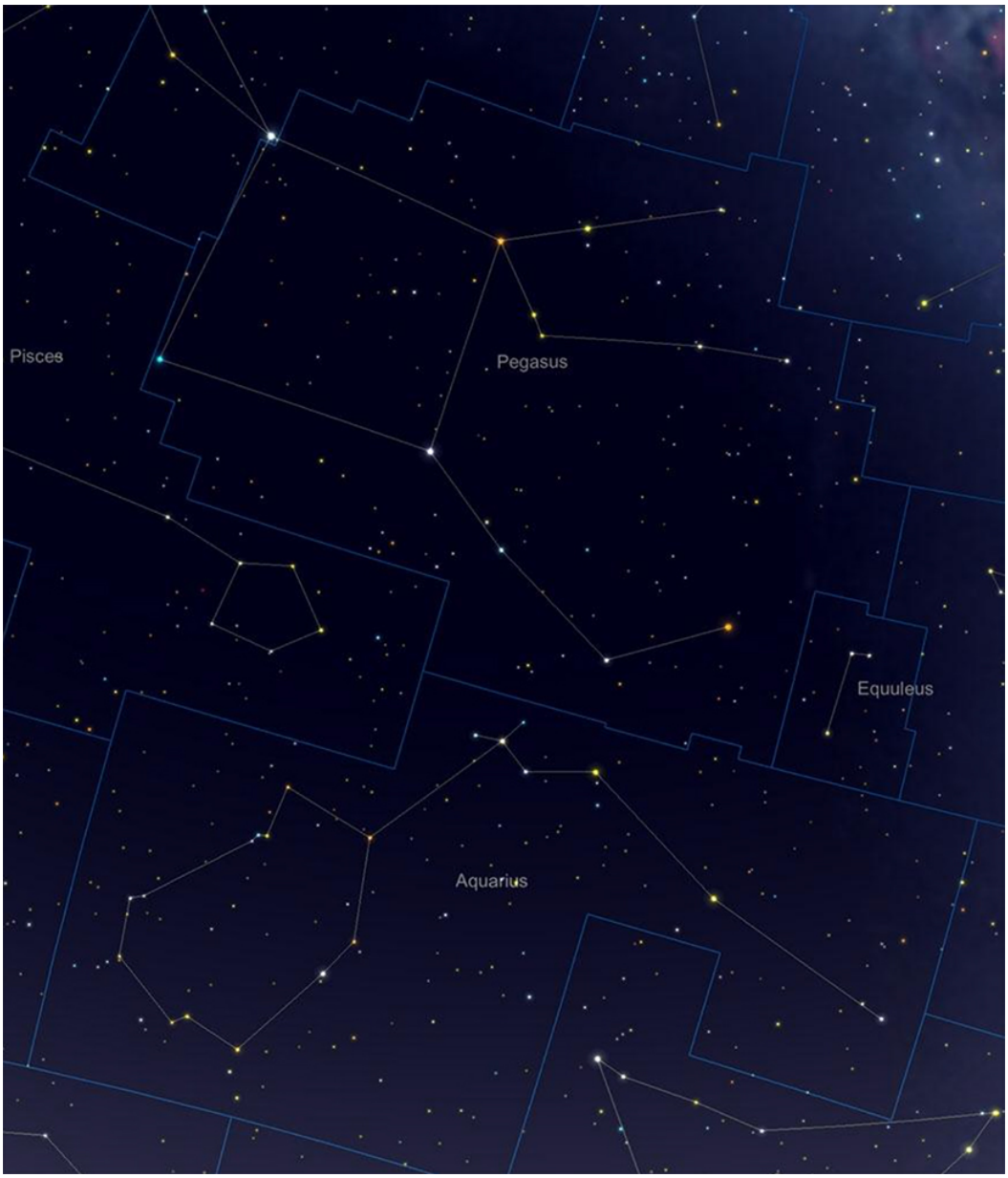
Meteors

There are no major meteor showers which peak in September. The Southern Taurids Shower begins around 10th September, but peaks on, or around 10th October. The Taurids are noted for fireball events, many of which have been caught on camera. However, the shower itself is quite sparse, reaching a Zenithal Hourly Rate of around five.

The next recognised major showers are the Draconids and Orionids of October.

Even at times of low meteor shower activity, sporadic meteors can appear from any direction in the sky and if you are out long enough during the night, away from moonlight, you’re likely to see some evidence of this.

Deep Sky Delights in Pegasus and Aquarius



Pegasus and Aquarius. Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

The arrival of Pegasus and Aquarius in the evening skies are a sure sign of the approach of Autumn. These two fairly large constellations share a border and are home to some easy - and not-so-easy - deep sky targets.

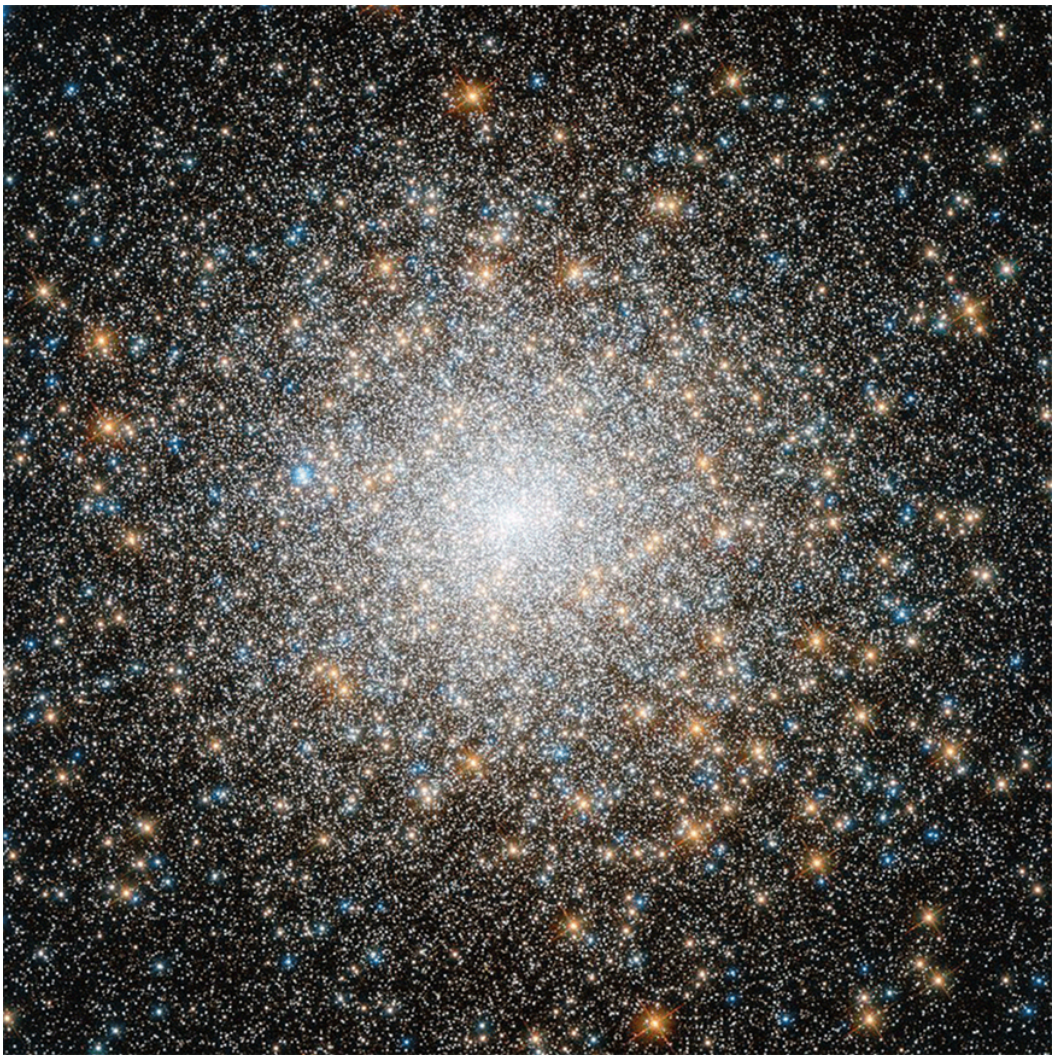
Though lacking in major nebulae, Pegasus is a haven for galaxies - maybe not quite to the extent of the Virgo and Leo regions - but has many extra-galactic targets worth attention.

The most famous feature of Pegasus is readily observable without a telescope - this is, of course, the famous Square of Pegasus. Consisting of the stars Alpheratz (Arabic for “the navel”), Scheat (”the leg”), Algenib (”the flank”), Markab (”the saddle”), the Square of Pegasus dominates this area of sky and

can be used as a useful “jumping off” guide for starhopping. However, the Square of Pegasus is not solely “of Pegasus”, as Alpheratz is actually now officially a part of neighbouring Andromeda. This is a similar situation to Elnath (Beta Tauri) which is officially now part of Taurus, but has been shared as Gamma Aurigae with neighbouring Auriga. These constellations are rare as they are still shown on modern star charts as connected via their “shared” star.

A third of the way along the line between the lower stars of the Square, Markab and Algenib, lies an object not visible to the naked eye at all. This is the notable (if unspectacular) Pegasus Dwarf Galaxy, This is an associated galaxy with the nearby M31, the Andromeda Spiral and as such a neighbour of our own Milky Way. It’s a rather faint object at +13.2 mag and spread out over a reasonable area of sky, so is only really detectable in long duration photos. Dwarf galaxies are often (though not always) older, more primitive than galaxies such as our own. However, whilst they are not brilliant in the conventional visual sense, dwarf galaxies such as the Pegasus Dwarf are havens for Dark Matter. The Pegasus Dwarf lies 3 million light years away from the Milky Way and is tidally interactive with M31.

Much more easily-observed and better-known is an object on the other side of Pegasus: the great globular cluster, M15. Found 4 degrees north-east of the star Enif (Arabic for “nose”), or Epsilon Pegasi, M15 is a glorious object in any telescope or binoculars and at +6.2 mag can be seen as a naked eye object from a reasonable site. This globular was discovered by Maraldi in September 1746 and catalogued 18 years later by Messier in 1764. Located about 33600 light years away, M15 contains around 100,000 stars. As a well-known object, it has been studied exhaustively and found to contain the first extra-galactic planetary nebula discovered: Pease 1, first identified in 1928. In addition to Pease 1, M15 has a pair of co-orbiting neutron stars, 8 pulsars and two strong X-ray sources. It has been postulated that one of these sources is in fact a Black Hole, to which has been attributed M15’s relatively recent core collapse. Globular clusters are both beautiful and intriguing objects and M15 is almost certain to contain more as-yet-undiscovered features.

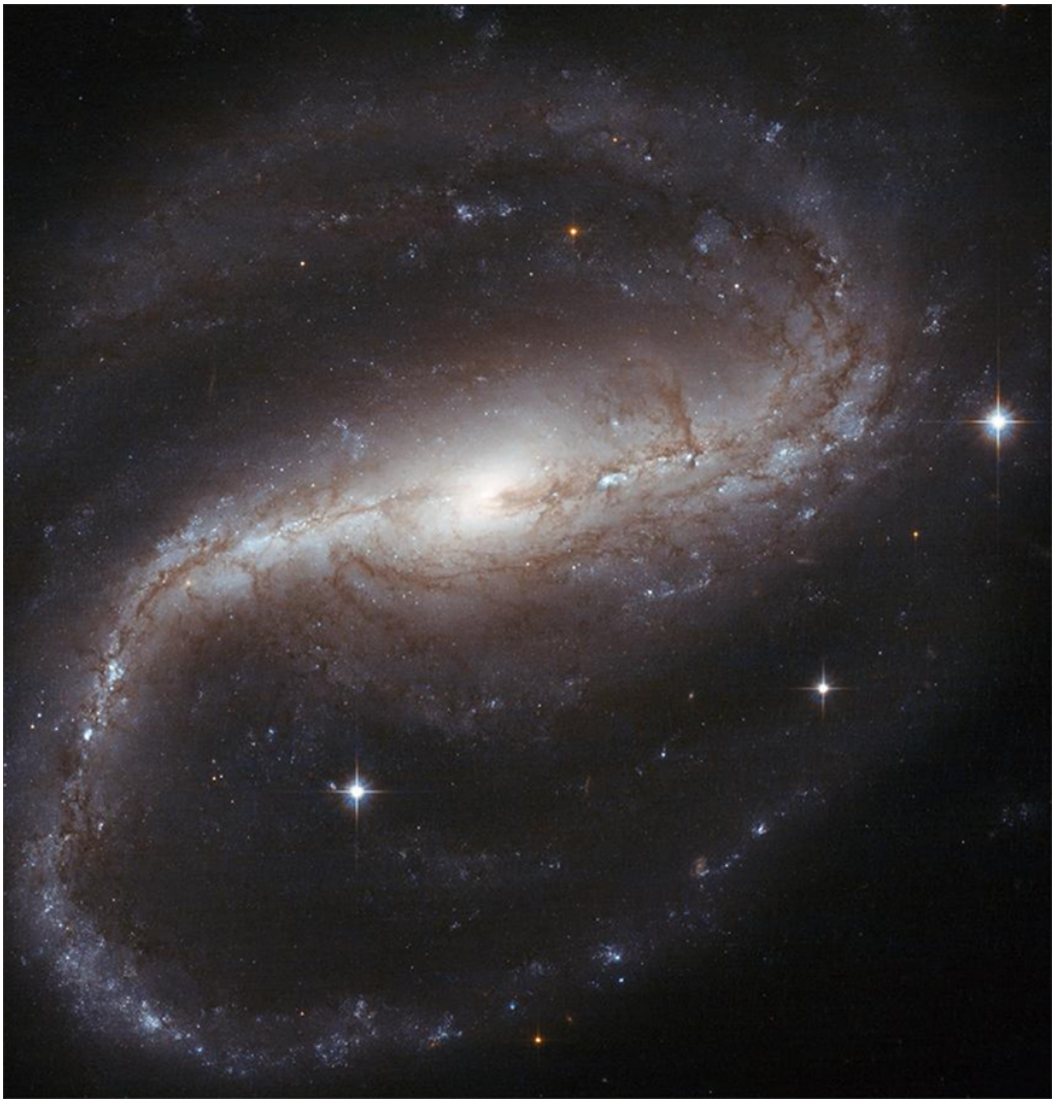


M15, pictured by the Hubble Space Telescope (showing Pease 1, upper left centre). Image Credit: NASA/ESA, Public Domain.

Back inside the Square of Pegasus lies the lovely NGC7814 - the “Little Sombrero” (so called because it resembles the Sombrero Galaxy, M104, in Virgo). NGC7814 is a Spiral, presented edge-on to our line of sight. This reveals a dark dust lane bisecting a bright core. At +10.6 mag this galaxy isn’t overly bright, but due to its compact nature, is still well-seen in small telescopes. NGC7814 is easily found due to its proximity to Algenib.

NGC7814. Image Credit: Hunter Wilson, Creative Commons.

Another galaxy near to a member of The Square is NGC7479, which lies just under 3 degrees south of Markab. This is one of the most photogenic Barred Spirals in the sky, lying almost face on to us. It was discovered in 1784 by William Herschel and is just slightly fainter than 7814 at +10.9 mag. NGC7479 is a very active galaxy - a so-called Seifert Type, in which enormous amounts of star formation are taking place. The serpentine structure of NGC7479 is beautifully depicted in long-duration photos - it almost seems to be slithering like a Sidewinder through space!



NGC7479, pictured by the Hubble Space Telescope. Image Credit: NASA/ESA, Public Domain.

Further north are a fascinating collection of galaxies: the NGC7331 group and Stephan's Quintet. These two groups of galaxies are separated by just half a degree of sky and can be found north of Matar (Eta Pegasi). Of the two groups, the NGC7331 group are the more conspicuous and their principle member was discovered first - by William Herschel - in 1784. This principle galaxy, NGC7331, was thought to be a very similar size, mass and taxonomy to our own Milky Way: a tightly-barred spiral. However, most up-to-date surveys of the Milky Way suggest that it may only have two massive spiral arms, whereas NGC7331 has more (NGC6744 in Pavo is now seen to be the nearest Milky Way analogue). Behind NGC7331 lie NGCs 7340, 7336, 7335, 7327 and 7338 - some of which can be seen with averted vision in reasonable-size telescopes. NGC7331 at +9.5 mag is by far and away the most prominent of the group and can be seen in smaller scopes. The whole group is a great target for astrophotography as regular contributor Mark Blundell's picture below clearly shows.

NGC7331 and Stephan's Quintet. Image Credit: Mark Blundell.

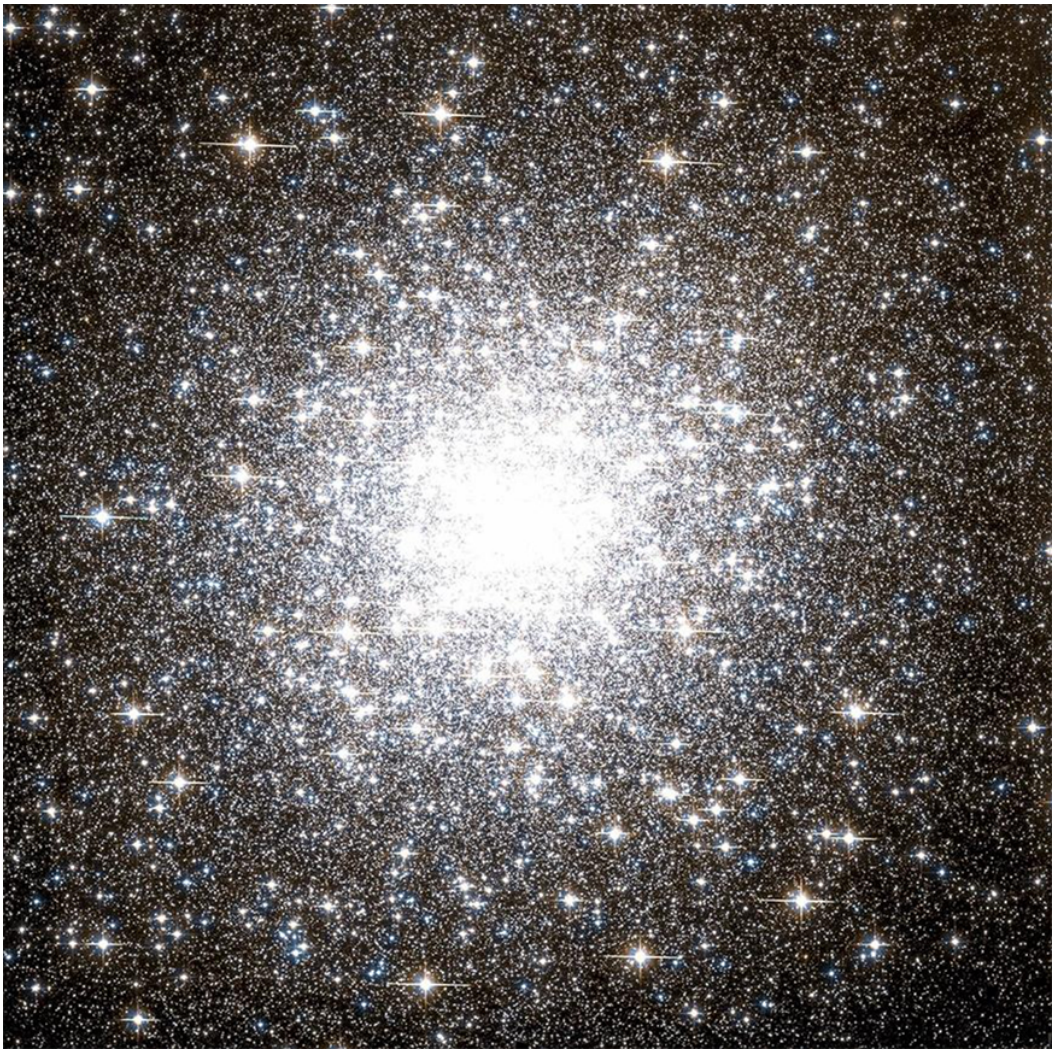
The second of these two galaxy groups is the famous Stephan’s Quintet. Discovered in 1877 at Marseilles Observatory by Eduoard Stephan, the Quintet consists of NGCs 7317, 7318, 7318A, 7318B, 7319 and 7320 (this is technically a Sextet as 7318A and B are separate galaxial cores). Stephan’s Quintet occupies a tiny area of 3.5′ x 3.5′ of sky and is an area of both enormous destruction, as the component galaxies literally rip each other apart and massive areas of creation where the resulting gas-rich loops of material released by these dynamics leads to starbirth.

The interior of Stephan's Quintet, pictured by the Hubble Space Telescope. Image Credit: NASA/ESA, Public Domain.

Of the components of the Quintet, NGC7320 appears to be an unrelated foreground object - much closer to us at 39 million light years distance as opposed to the 210-350 million light years of the other members.

Moving south into the Zodiacal constellation of Aquarius, the Water Carrier, we are presented with a large, but quite a barren area of sky. Although Aquarius is rather muted in terms of brighter stars, it is a haven for deep sky objects. The most northerly of these is the very fine globular cluster M2. At +6.46 mag, it is amongst the brighter of these interesting objects, lying 37,500 light years away from us and about 175 light years in diameter. From Earth, it appears 2.1 arc minutes in diameter, M2 is about the same relative size and brightness of the neighbouring M15 and the second of Hercules' well-known globulars, M92. Discovered by Comet Hunter Jean-Dominique Maraldi in 1746, it languished in

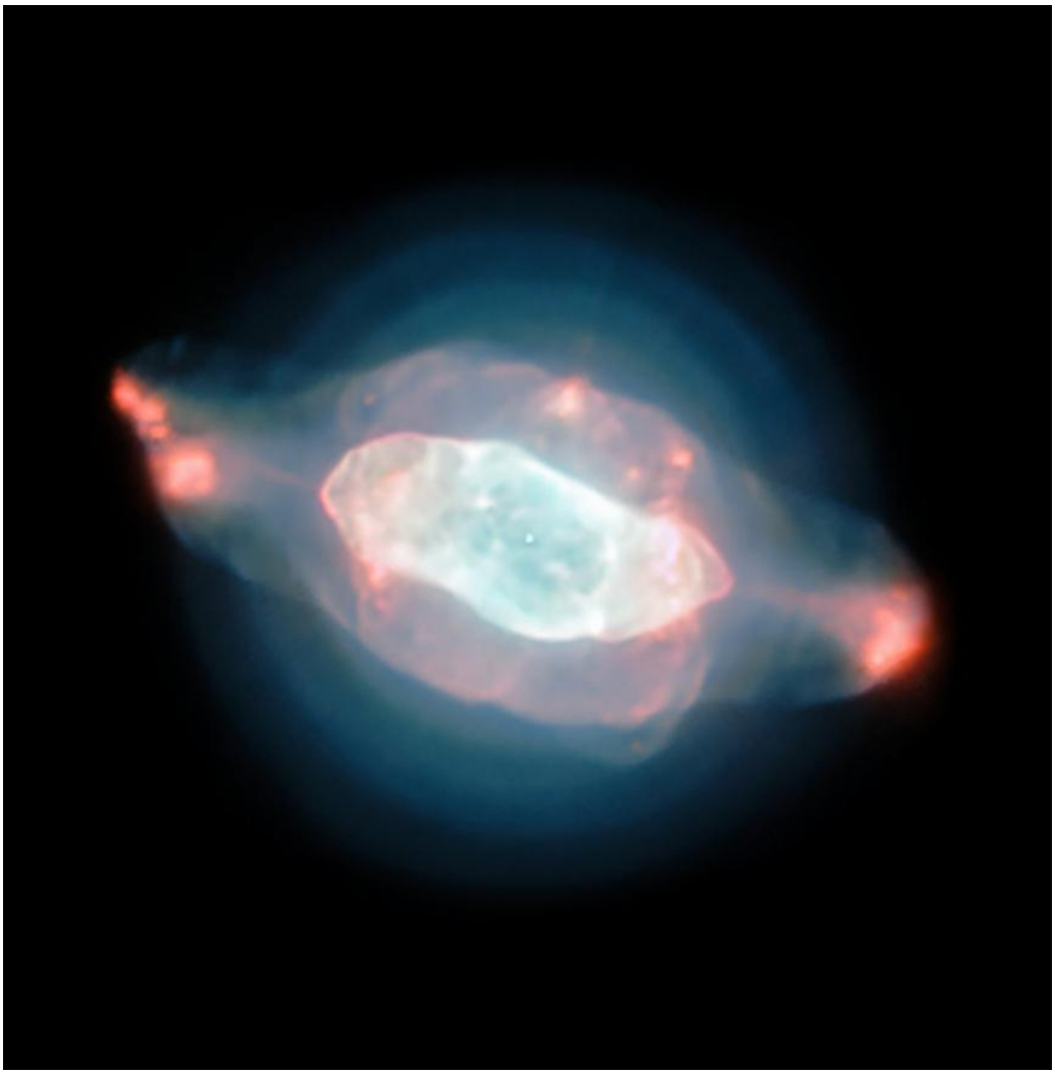
relative obscurity until Messier added it to his list in 1760, describing it as a “Nebula without stars”. Modern instruments show it as most definitely “with stars”, indeed there are several beautiful star chains visible through telescopes, as well as some deep, dark lanes and patches, adding to the “three-dimensionality” of the object, particularly in larger telescopes. There are quite a mix of older orange and newer blue stars within M2, making it a particularly pretty telescopic sight.



M2, pictured by the Hubble Space Telescope. Image Credit: NASA/ESA, Public Domain.

Moving SW from M2, we arrive at three objects in quick succession: NGC 7009, The Saturn Nebula, the asterism M73 and another globular, M72. The Saturn Nebula is a fascination Planetary Nebula, well worth seeking out in any telescope, as it is reasonably bright, at +7.8 mag, yet compact at 0.5 arc minutes across. Telescopes of 6-8-inch aperture will be needed in order to see the two extended lobes that give the object its popular name. Lord Rosse, observing NGC 7009 in 1850, described two lobes or projections sitting either side of the nebula, making it appear very similar to Saturn, when its rings are

edge on to us. Although the object has a distinctly un-Saturn-like green-blue hue, which is most easily seen in long duration photographs. The Saturn Nebula, in common with some other Planetaries - including the Blinking Planetary - can appear to blink on and o when looking at it for prolonged periods. This is of course a trick of the eye, caused by NGC 7009's reasonably bright central star overwhelming a dark-adapted observers eye. When the observer averts their vision slightly, the Saturn Nebula returns to view. Although the Blinking Planetary is the most well-known object that exhibits this phenomenon, to the writer's mind, the Saturn Nebula is actually the best example of a "Blinking" Planetary Nebula. As ever, aperture helps in resolving the finer details of NGC 7009 (especially the projections), but the Saturn Nebula should be sought out by all those with telescopes - it's certainly bright enough to be seen in even the smallest scopes.



Saturn Nebula, pictured by the Hubble Space Telescope. Image Credit: NASA/ ESA, Public Domain.

The next object is an interesting one. When is a star cluster not a star cluster? Answer: when it's an Asterism like M73. Lying less than 2 degrees SW of the

Saturn Nebula, M73 has been the subject of some controversy over the years since its discovery. Charles Messier first noted it in 1780 as a “cluster of four stars with nebulosity”, although this nebulosity has never been picked up by any other observers. John Herschel, whilst including it in his General Catalogue, was suspicious of its definition as a true cluster. Debate raged on throughout the 20th century as to the true nature of the Y-shaped M73, with evidence of a relationship between the members of the group being published for and against. The matter was finally and conclusively put to bed in 2002, when spectral signatures of each of the constituent members, gathered in high resolution, concluded that they were all moving in different directions and the cluster was not, it fact, a cluster. M73 is not unique amongst the Messier list for controversial description, but remains interesting for the fact that it took so long to finally work out its true nature.

1.5 degrees to the west of M73 is the slightly less controversial Globular Cluster M72. At +9.27 mag, it is considerably fainter than M2, despite being not much smaller. M72 is considerably further away from us than M2 - it lies 55,000 light years distance from Earth. As it is fainter and further away, M72 requires a larger telescope to resolve individual stars. It is a pleasing sight in a 10-inch reflector and above, though William Herschel in his observing notes of 1783, noted that a power of 150x was needed to resolve the individual stars “fairly”.

M72, pictured by the Hubble Space Telescope. Image Credit: NASA/ESA, Public Domain.

Lastly, we journey 23 degrees east of NGC 7252, to rendezvous with the closest Planetary Nebula to Earth, NGC 7293 - The Helix Nebula. Overlooked by experienced observers, such as Messier and William Herschel, it is not difficult to understand why. Though intrinsically quite bright at +7.59 mag, the Helix is half the diameter of the Full Moon, which spreads its surface brightness out considerably. The Helix was eventually discovered around 1824 by German Astronomer Karl Ludwig Harding. Observation or the Helix requires either large binoculars and a very dark site, or a wide eld low power eyepiece and as much telescopic aperture as you can throw at it! Large Dobs are the ideal instrument for observing the Helix, particularly when coupled with an OIII filter. From our perspective on Earth, we see the Helix like looking down a tube. Its prolate spheroid shape is almost aligned on axis with us, at a distance of 650 light years. 2.5 Light years across, the Helix appears 14.7 arc minutes across at its widest point. A magnificent object, it will take the right conditions to see it well - if the Moon’s up, you’ll have to wait until it has set before attempting to locate the Helix. It will be well worth the wait though.

The Helix Nebula, pictured by the Hubble Space Telescope. Image Credit: NASA/ESA, Public Domain.

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