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SKY GUIDE

Astronomical guide for
June 2025

The most up-to-date guide to planetary and lunar activity, comet news and space wonders.

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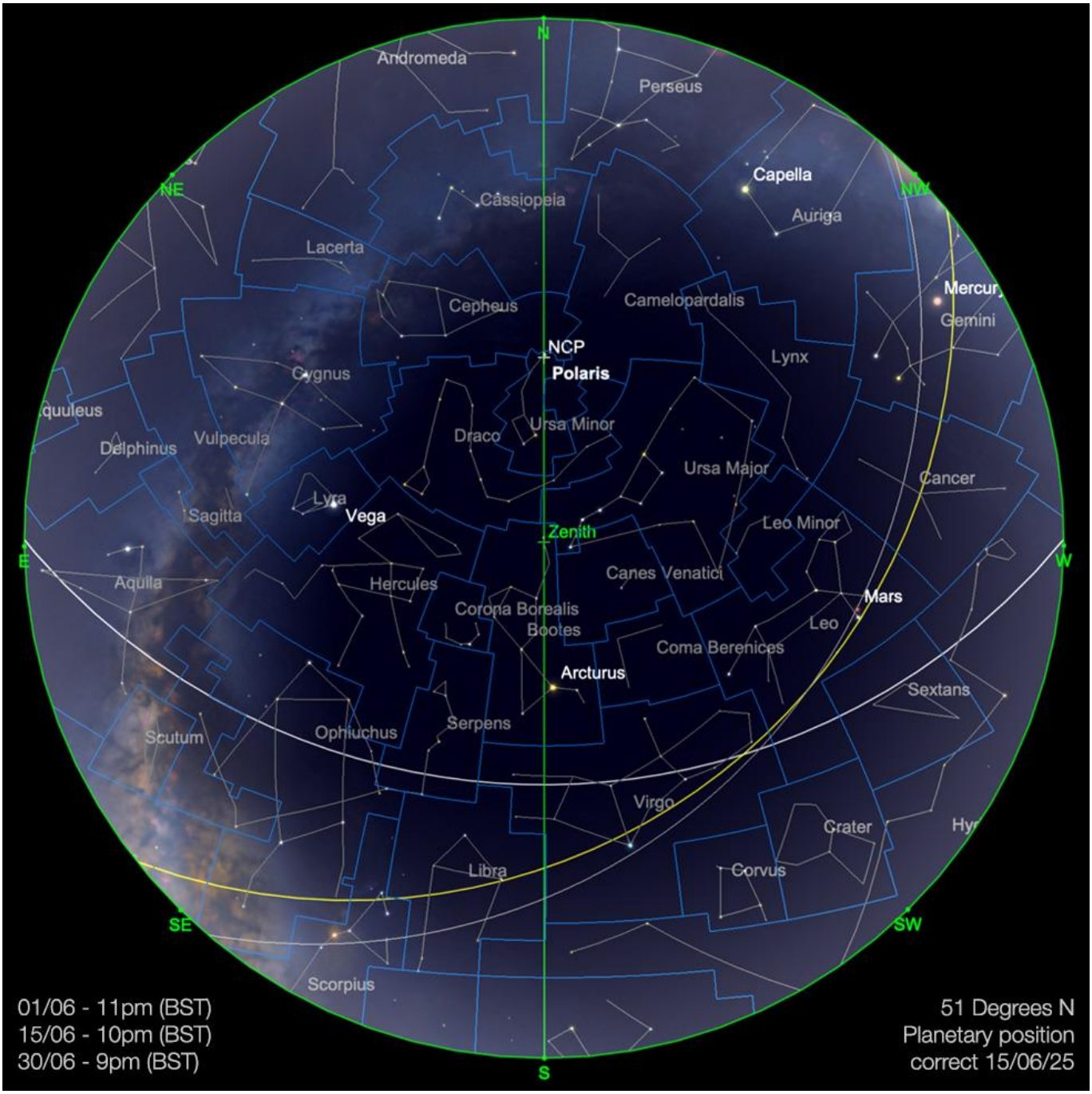
Expand your horizon

Bresser UK June Sky Guide



June is significant for astronomers, particularly in the Northern Hemisphere where it marks the brightest part of the year, due to the Summer Solstice, which this year falls on June 20th. This event causes the Sun to reach its highest point in the sky, resulting in long days and short nights because of Earth's 23.5-degree axial tilt. Conversely, the Southern Hemisphere experiences Midwinter.

In Northern latitudes, this period leads to permanent Astronomical Twilight around the Solstice, meaning the sky never fully darkens. For instance, from late May to mid-July 2024, those around 50° north experience this continuous twilight, affecting deep sky observations.

The duration of this twilight extends further, the further north you find yourself: Manchester experiences

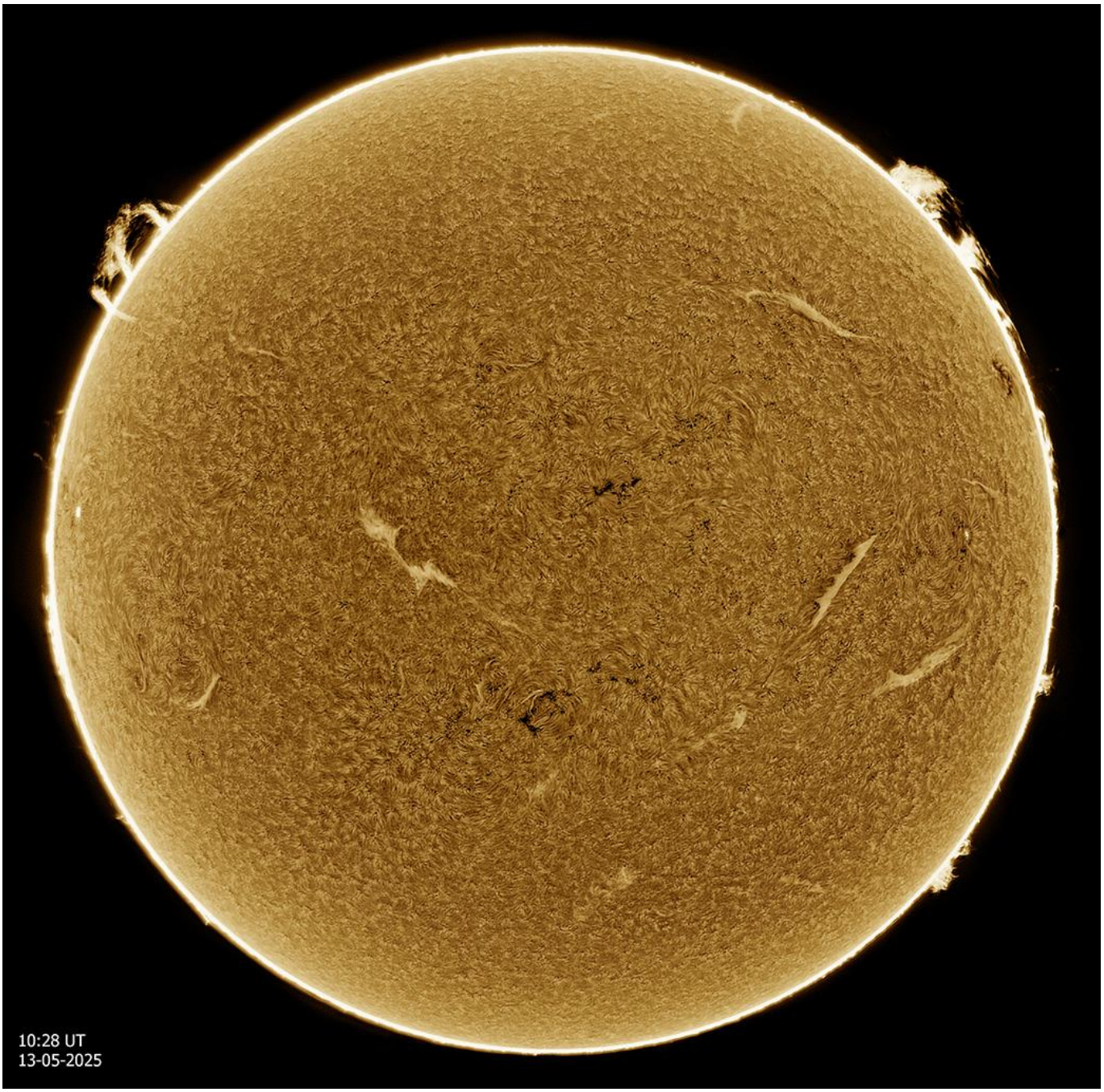
it from mid-May to late July, Edinburgh from early May to early August, and Reykjavik from early April to early September. North of the Arctic Circle, the Sun does not set around the Solstice, while south of the Antarctic Circle, it does not rise at all.

No matter where you find yourself in the world, as ever, there’s plenty to see in the sky is above us this month.

The Solar System

The Sun

As previously mentioned, the Sun reaches the summer solstice in the northern hemisphere on June 20th. The Sun has been extraordinarily active of late, which is no surprise, as we are heading up to what should be the peak of the current 11 year solar activity cycle. The night of the 11th and 12th of May were witness to some of the most spectacular displays of aurora seen the last 20 years. This was due to a series of large coronal mass ejections from Sunspot group AR3664. This event reached G5 conditions, which are the most powerful events of this kind we can expect to experience. Aurora was seen as far south as the Canary Islands (28° north) and conditions such as this are extremely rare and give us some idea of the awesome power of our parent star. The Sunspot group responsible for these series of CMEs has rotated around the Sun and at a time of writing is about to become visible again on the surface of the Sun that faces Earth. It will be interesting to see if any of this group produce similar ejections in the near future.



The Sun, taken by Mel Gigg in May 2025, using a Lunt LS60 H-Alpha Telescope and ZWO ASI 178 Mono camera. Image used with kind permission.

The Moon

We start June with the Moon in Leo - a 6 day old waxing crescent, not far from the rapidly diminishing Mars, which is found a little under 5 degrees to the west. The Moon will transit in the south around three hours before sunset on the 1st.

The Moon will reach first quarter phase on the 3rd, when it will be in the extreme east of Leo. After this it will cross the wide expanse of Virgo and head into the southerly part of the ecliptic: Libra, Scorpius and the non-zodiacal Ophiuchus, where it will become full on the evening of the 11th. Naturally, this part of the month, coupled with permanent astronomical twilight which many in the northern hemisphere are experiencing at this time of year, make this time particularly inopportune for deep sky observing and imaging.

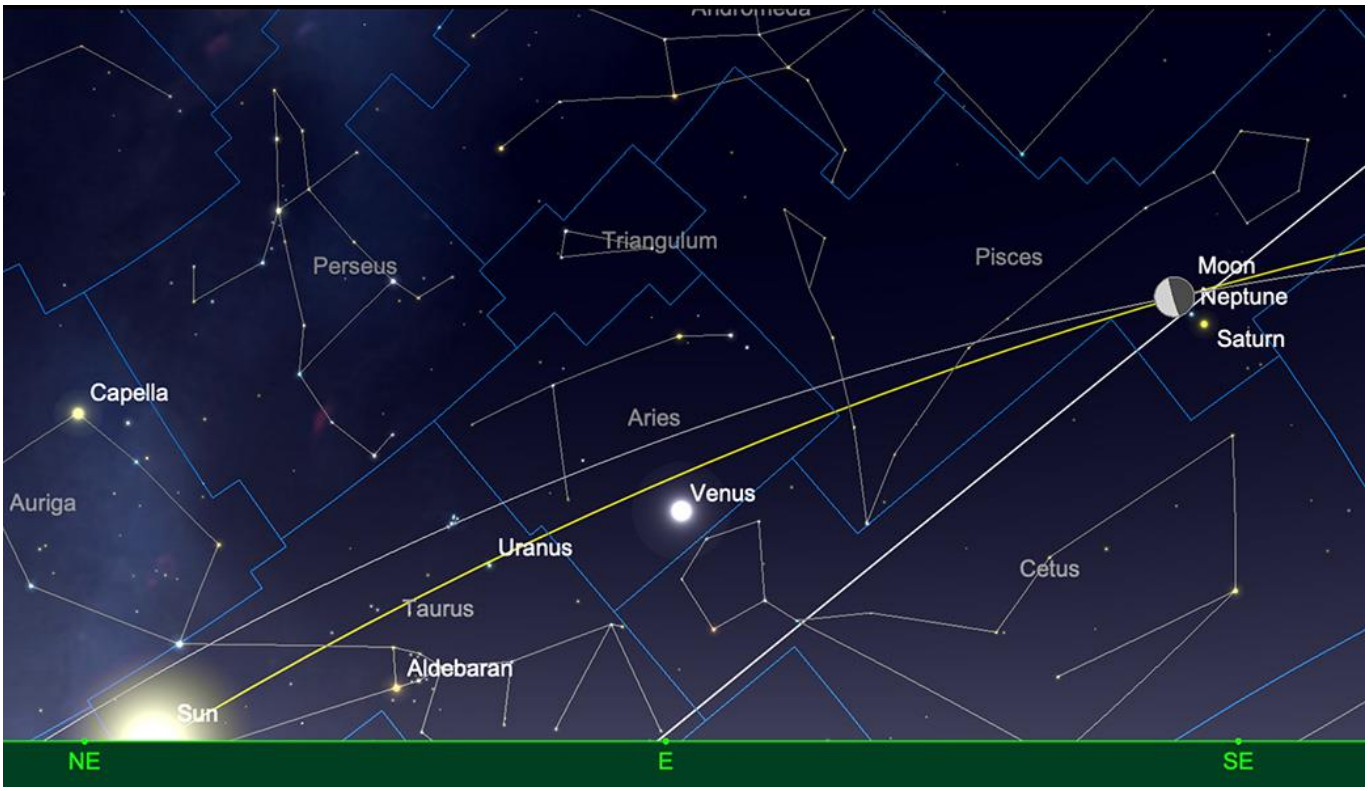
Our natural satellite then continues its path through the extreme south of the ecliptic, through Sagittarius, before moving into Capricornus, Aquarius and on into Pisces, where it will reach last quarter phase on the 18th. The following morning of the 19th finds the Moon rising in line with Saturn and the much fainter Neptune - all three objects separated by no more than two degrees. Saturn and the Moon will be easy to pick out for those with binoculars or a telescope - and clear eastern horizons. Neptune will be much more of a challenge, with its altitude and the lightening morning skies making the +7.9 magnitude planet almost impossible to see.

The Moon continues its journey sunward through Aries, where it will form a pretty pairing with Venus, for early risers on the morning of the 22nd. The two will be separated from each other by just under 6 degrees.

The Moon becomes new on the Auriga/Gemini borders on the 25th June. Joining the Sun, as it slides to the north of our parent star, just after the northern hemisphere summer solstice, this is the most northerly New Moon of the year.

After this point, the Moon will become an evening object again, slowly moving away from the Sun during the final days of June. The 2.6 day old waxing crescent Moon acts as an excellent signpost to the planet Mercury on the evening of the 27th - the two residents of Cancer and sitting low in the west after sunset.

We end the month on the 30th, with the Moon at just over 30% illuminated crescent phase in Leo, having passed Mars again on the previous evening of the 29th.



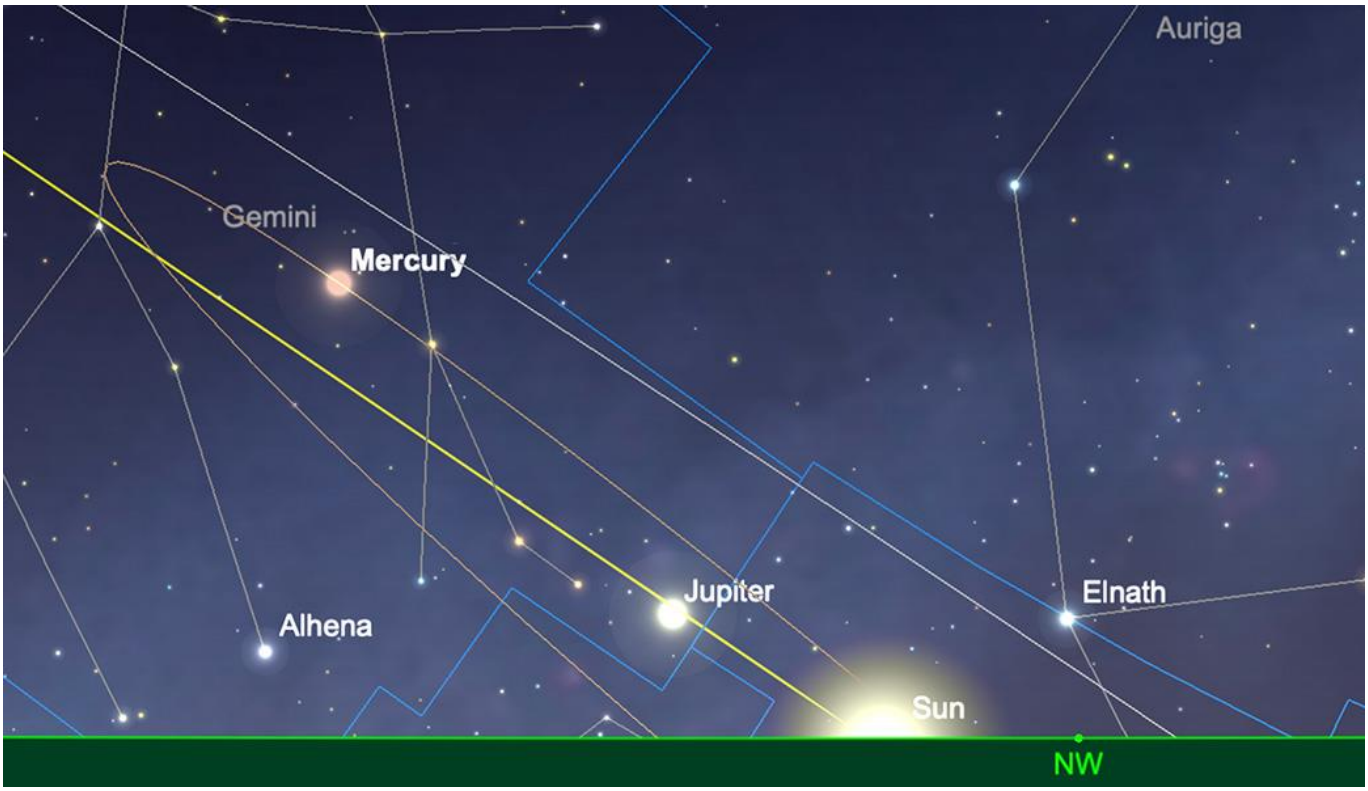
The Moon and Saturn and Neptune, sunrise, 19th June. Image created with SkySafari 6 for Mac OS X, ©2014-2018 Simulation Curriculum Corp., skysafariastronomy.com.

Mercury

We begin June with Mercury at superior conjunction with the Sun and as such unobservable. The planet emerges from the Sun's glare and at the beginning of the second week of June comes into close conjunction with Jupiter - the two worlds being separated by under 2 degrees. As both planets are just over 11 degrees from the Sun, this will be very tricky to spot and will require very clear horizons (as both sit around 5-6 degrees above the horizon at sunset, as observed from 50 degrees north) and clear sky conditions to observe. Jupiter is distinctly brighter than Mercury: -1.9 magnitude, to Mercury's -1.2. But with binoculars or a small telescope and clement conditions, it should be possible to spot both planets.

Mercury gets progressively larger, yet dims as it moves away from the Sun and its phase decreases. By the 15th, it will have decreased in brightness to -0.6 magnitude, but increased its separation from the Sun to over 18 degrees, making it a little easier to find. Mercury now stands just under 11 degrees high at sunset (again, as observed from 50 degrees N).

Towards the end of the month, Mercury will have climbed yet further away from the Sun and will sit just above 11 degrees above the horizon as the Sun sets. On the 30th, Mercury will appear +0.4 magnitude and show a 7.7 arc second diameter, 45% illuminated.



Mercury at sunset, 15th June. Image created with SkySafari 6 for Mac OS X, ©2014-2018 Simulation Curriculum Corp., skysafariastronomy.com.

Venus

As previously mentioned, Venus is most definitely a morning object during June. It neatly reaches maximum western elongation in Pisces on the 1st, marking its furthest separation from the Sun. Rising at a little before 3.30am (BST) on the morning of the 1st, the planet will be at -4.3 magnitude, displaying a disc of just under 24 arc seconds diameter, illuminated by just under 50%. Although Venus sits 45 degrees to the west of the Sun, it in in a very shallow rising region of the ecliptic plane, as seen from mid-northern latitudes, so sits rather low in the sky - around 14 3/4 degrees elevation, at sunrise on the 1st.

By the time we get to mid-June, Venus has decreased in brightness fractionally to -4.2, but now sits just under 17 degrees high in the east at sunrise (from 50 degrees N), having moved over the border into Aries. The planet has increased its phase a little to just under 57 arc seconds diameter, as it draws away and round the Sun from our perspective here on Earth.

At the end of June, Venus has again shrunk both in brightness and size, sitting at -4.1 magnitude and just under 18 seconds of arc respectively. The planet is now in eastern Taurus and stands around 20 degrees above the horizon as the Sun rises.

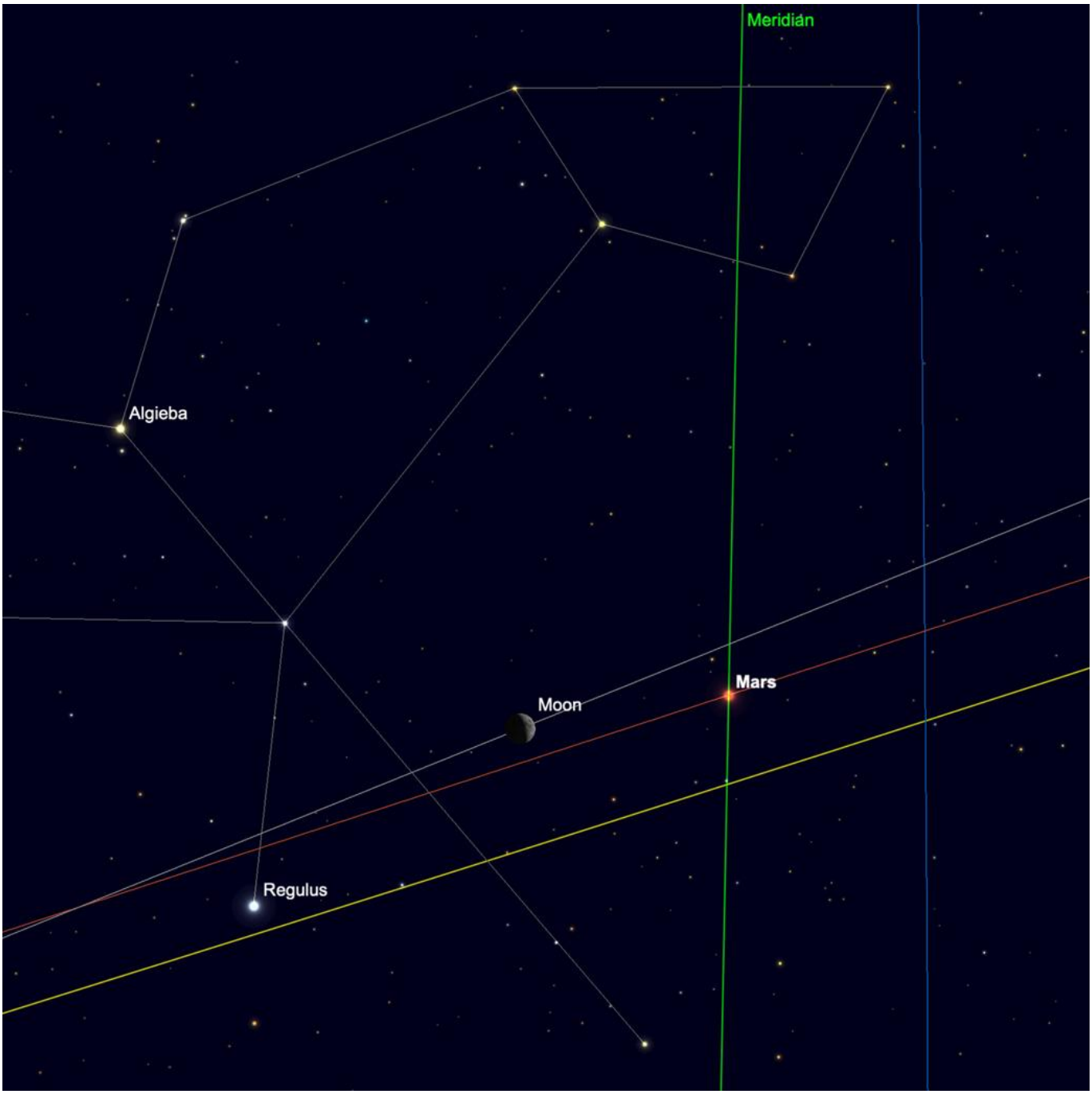
Venus, max elongation, sunrise, 1st June. Image created with SkySafari 6 for Mac OS X, ©2014-2018 Simulation Curriculum Corp., skysafariastronomy.com..

Mars

Mars is a resident of Leo during June and as previously mentioned is joined in conjunction with the Moon on the evening of the 1st. As mentioned in previous sky guides, Mars is now significantly diminished from the peaks that it reached in January, while at opposition and at its closest point to Earth. The 1st sees Mars at +1.3 magnitude and 5.5 arc seconds diameter. While this is hardly faint and Mars is easily a naked eye object, even from some of the most light polluted environments, telescopically, Mars now requires significant amounts of magnification to show any detail on its surface at all. Smaller telescopes will struggle to detect any albedo features at all, as greater light gathering power will be required to detect tonal and brightness variations in an object of this size.

By mid-month, Mars will have diminished in magnitude and size to +1.4 and 5.2 arc seconds respectively. The planet will sit very close to Leo's principal star, Regulus (Alpha Leonis) at this point. The two bodies separated by just over a degree and around 0.1 magnitudes brightness.

By the time we reach June's end, Mars will have diminished yet further to +1.5 magnitude and 4.9 arc seconds diameter.

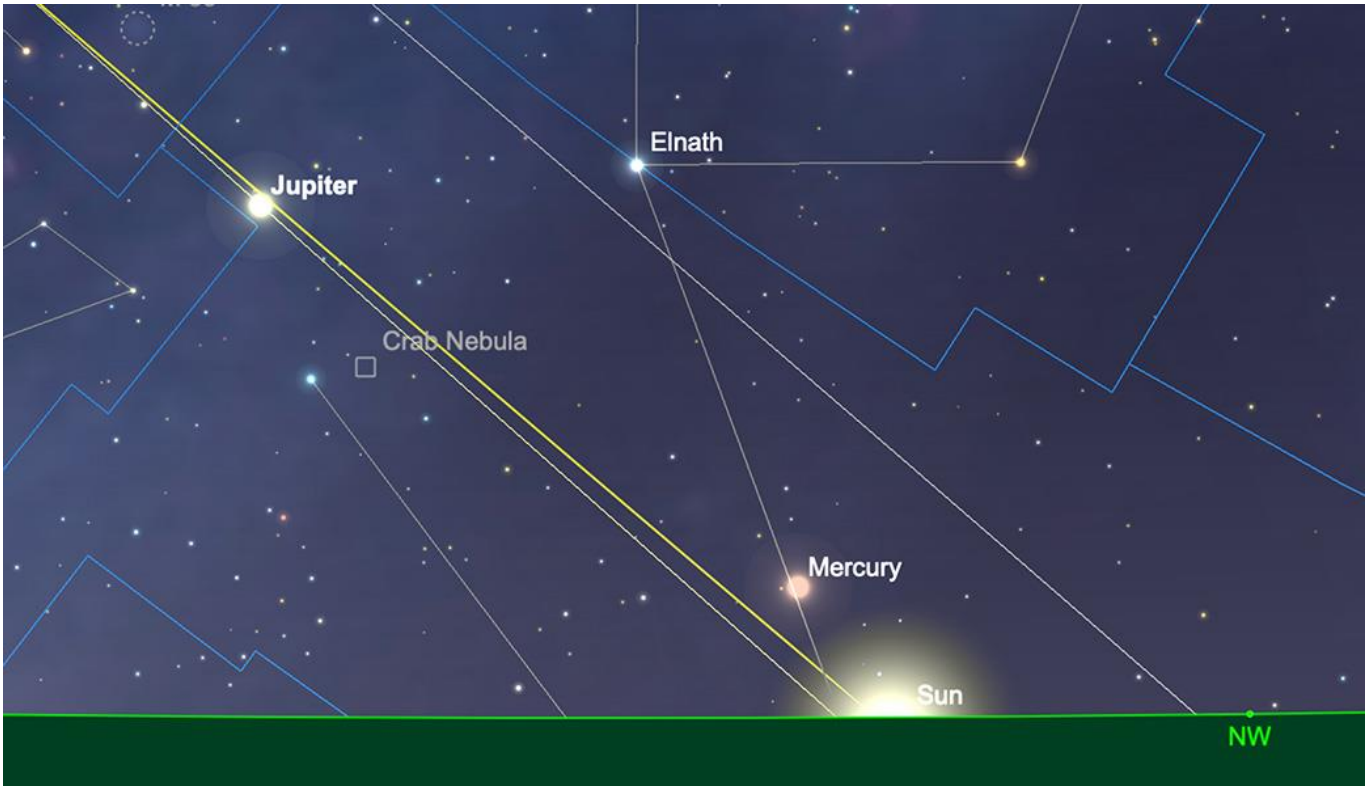


Mars and the Moon, under the Sickle of Leo, early evening, 1st June. Image created with SkySafari 6 for Mac OS X, ©2014-2018 Simulation Curriculum Corp., skysafariastronomy.com.

Jupiter

Sadly, we are at the end of Jupiter's spectacular evening apparition for this year. We start June with Jupiter still observable in the west after sunset. But at 16 degrees from the Sun, despite at a healthy -1.9 magnitude and 32 arc seconds diameter, will be in an area of the sky that is less than optimal for telescopic observation.

As the month progresses, Jupiter's situation deteriorates, as it sinks further towards the Sun. This situation culminates in Jupiter's superior conjunction with the Sun on June 24th. After this point, Jupiter will slowly re-emerge as a morning object - but it will be a while until it is in a better position in relation to the Sun for meaningful observations to begin again.



Jupiter and Io, dawn, June 30th

Saturn

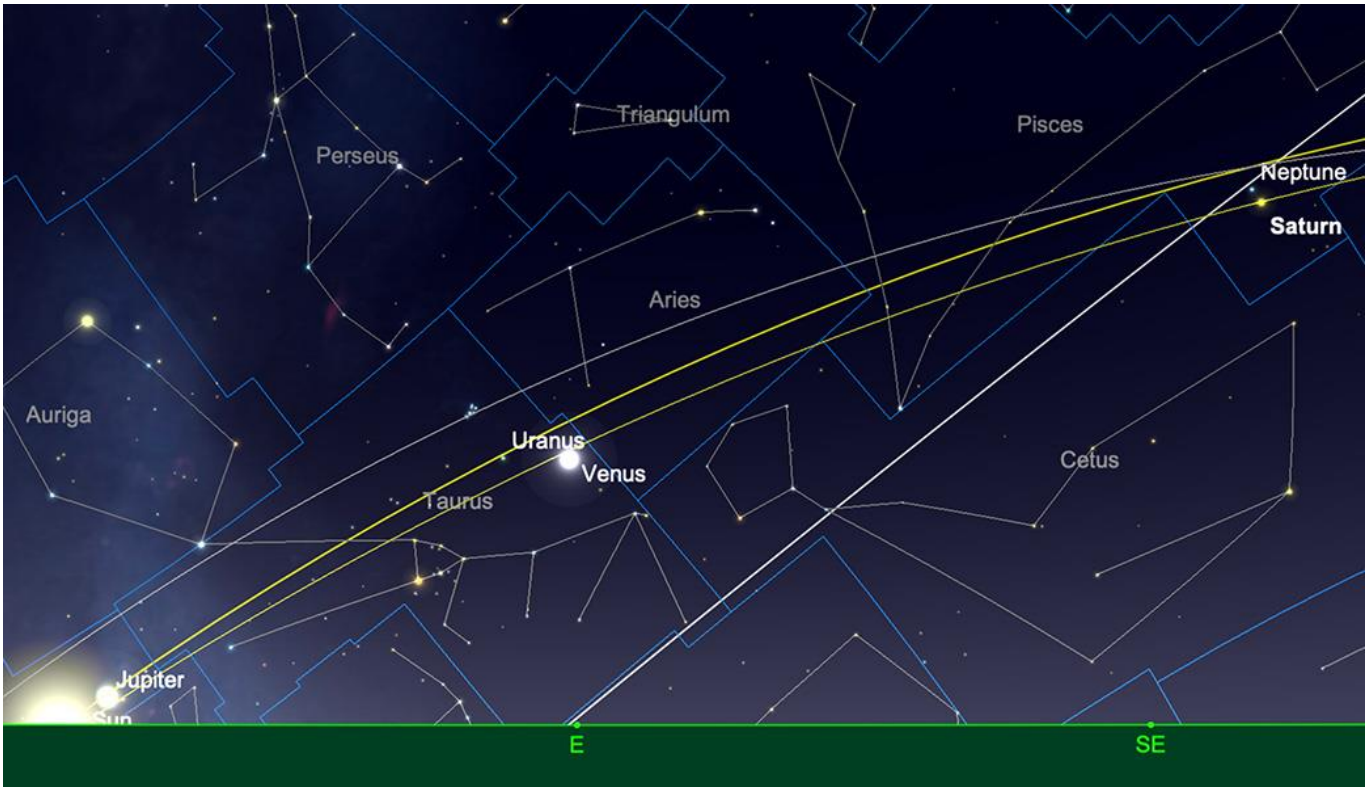
Saturn is to be found considerably further west in the ecliptic, in Aquarius. Shining at a steady, if unspectacular brightness of +1.2 magnitude, as the month begins, Saturn presents a 17 arc second diameter desk on the morning of the 1st. It will rise at a little past 2 am and will have attained an altitude above the horizon of just over 22 1/2° (as observed from 51° north), just before sunrise.

Saturn's rings are narrowing, as observed from our perspective here on Earth, reducing the planet's brightness and making its smaller moons more visible, along the equatorial plane of their rotation.

Saturn will be occulted by the waning gibbous Moon on June 27th, visible around 13:00 UT from eastern Australia, northern New Zealand and much of the Southern Pacific. Sadly, this event won't be visible for those of us here in Europe.

Saturn begins retrograde motion at the end of the month and will rise before midnight for all observers by late June. As mentioned in previous Sky Guides, this retrograde motion is a sure sign that the planet is gearing up for opposition. However, in Saturn's case this is still some way away and won't be reached until early September.

We end the month with the Saturn at +1.1 magnitude, standing just over 32° high above the horizon as the sun rises (again, as observed from 51° north). Saturn has now attained an altitude above the "magic" +30 degrees elevation for observers in locations around 49° north and below - and as such, telescopic observing conditions should begin to improve concurrently.

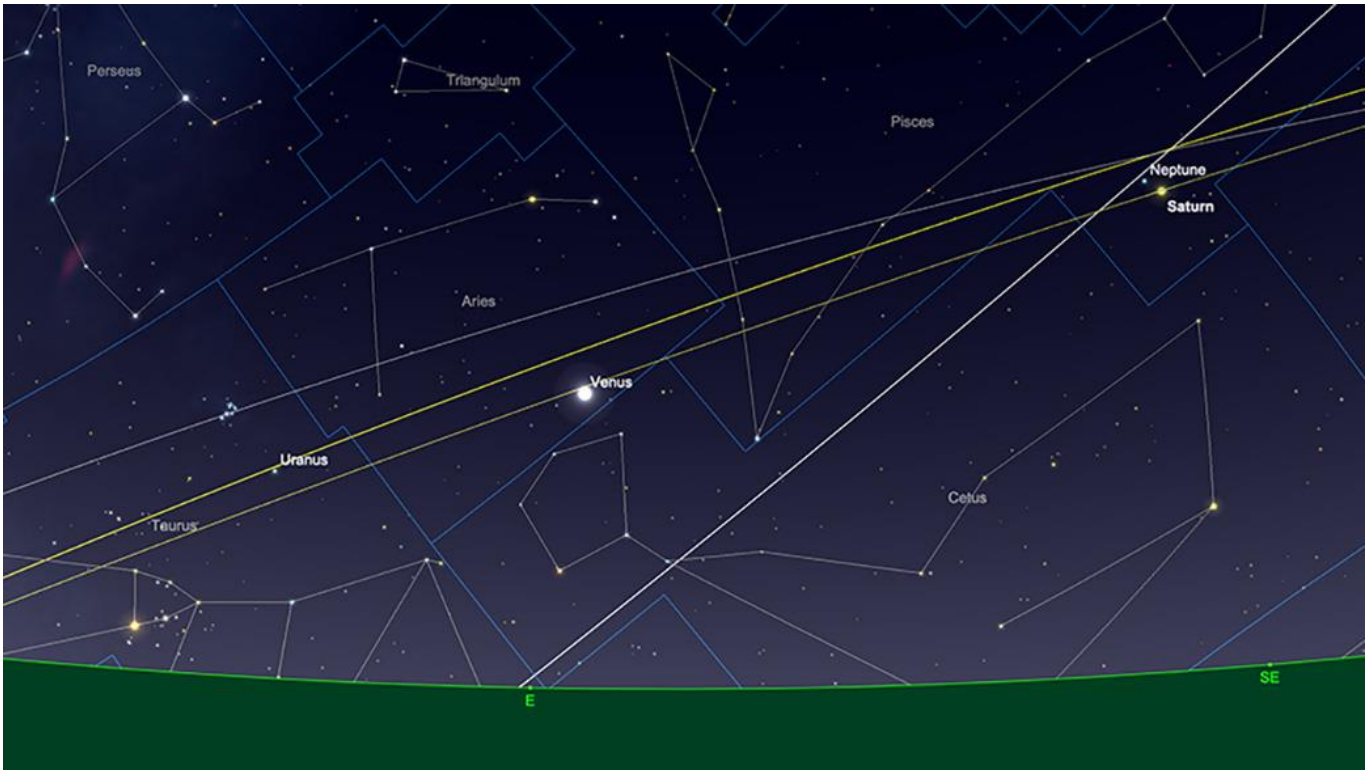


Saturn at sunrise, 30th June. Image created with SkySafari 6 for Mac OS X, ©2014-2018 Simulation Curriculum Corp., skysafariastronomy.com.

Uranus and Neptune

The outer gas giants are poorly positioned for observation at present. Uranus is emerging from superior conjunction with the Sun and lost in the morning glare in Taurus.

Neptune is further west in the ecliptic and while very close to Saturn, in Pisces, is probably not worth looking for at present. Even though it is separated from the Sun by a decent angular amount, the lighter skies and encroaching dawn will make it practically impossible to pick out at all.

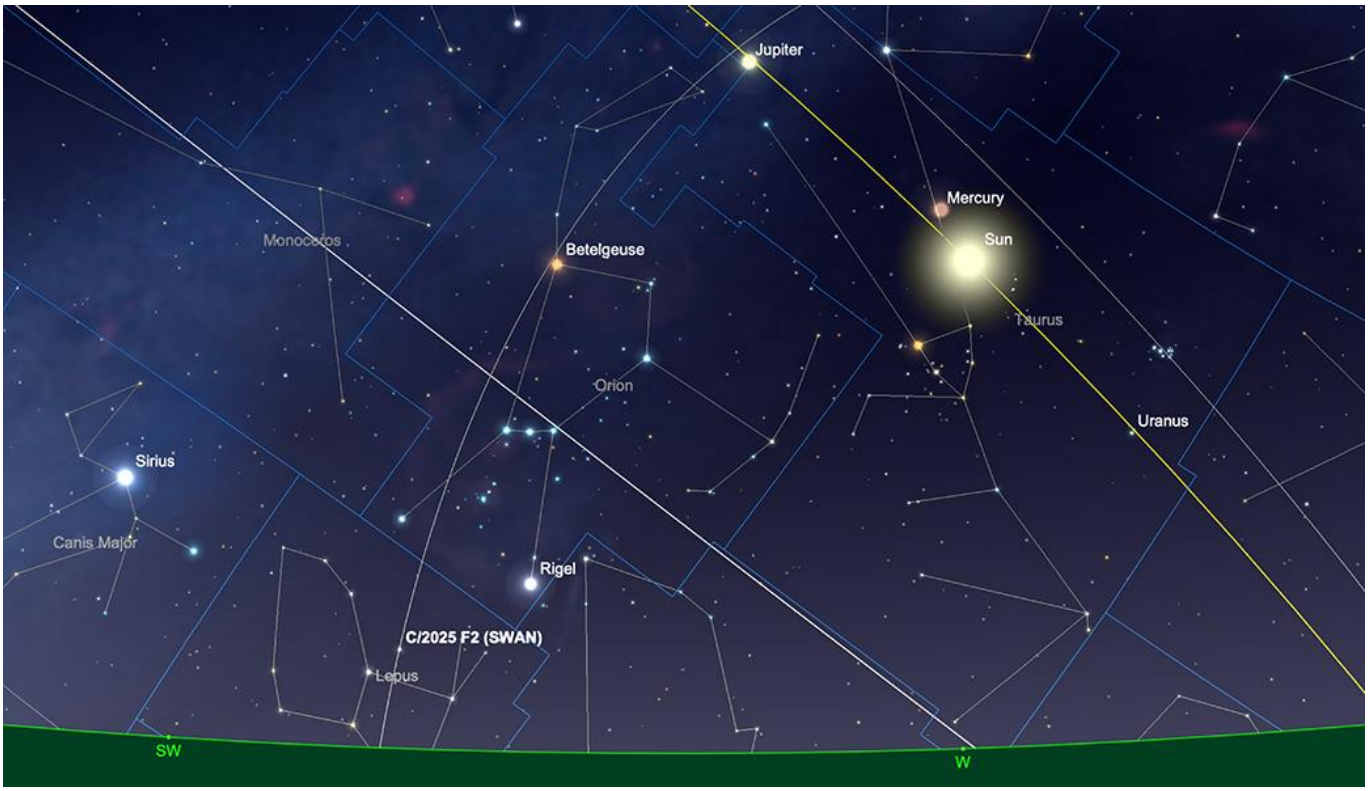


Uranus and Neptune relative positions, 30th June 2025. Image created with SkySafari 6 for Mac OS X, ©2014-2018 Simulation Curriculum Corp., skysafariastronomy.com.

Comets

C/2025 F2 (SWAN) appears to be technically the brightest comet currently. However, this is headed rapidly south, at poor elongation from the Sun and won't be visible from much of Europe as a result during June. At current brightness prediction of around 9th-10th magnitude, it is hardly conspicuous.

All other observable comets currently visible are in the region of 12th-14th magnitudes, at best.



C/2025 F2 (SWAN), showing its path in relation to the Sun, June 2024 (comet position shown 1st June). Image created with SkySafari 6 for Mac OS X, ©2014-2018 Simulation Curriculum Corp., skysafariastronomy.com.

Meteors

There are no major meteor showers during June. Of course, you can see sporadic meteors on any night of the year - if you're in the right place at the right time. It's generally thought that an observer in any given point on the planet can generally see around 3 to 4 sporadic meteors per hour. However, this can increase somewhat in the hours before dawn, where the forward orbital motion of the leading part of our atmosphere increases the apparent incidental speed at which any potential debris hits us. This leads to more energetic and thus easily visible meteors.

Noctilucent Clouds

Noctilucent Clouds are often seen in June - their bright gossamer/web-like structures can normally be seen low on the northerly horizon, between latitudes of 50-65 degrees, when the Sun is between 6 and 16 degrees below the horizon. These clouds are mysterious - there were no recorded sightings of them before 1885. Some researchers believe they are formed as a result of volcanism, human-induced atmospheric pollution, or even the condensation of water vapour along the trails of meteors. Interestingly, a significant link between the power of

the Northern Polar Stratospheric Vortex and the production of NLCs in the Southern Polar Mesosphere (the atmospheric layer above the Stratosphere) has been found by analysis of ground based data and that gleaned from NASA climate satellites. It would appear that when the Northern Polar Vortex is particularly strong, this negatively affects the production of NLCs over the Southern pole over 12,000 miles away. These interconnections are a sure sign of how little we truly understand the mechanics of the atmosphere of our home planet and how much is still potentially to be uncovered.

Whatever their origins, now is the best time to see NLCs from Northern latitudes. Interestingly, whilst Noctilucent Clouds have been observed in the Southern Hemisphere, their incidence appears much fewer than their Northern Hemispherical counterparts.

A spectacular NLC display as shown above was captured by Bresser's Anke Morbitzer. Image used with kind permission.

Deep Sky Delights in Draco and Hercules

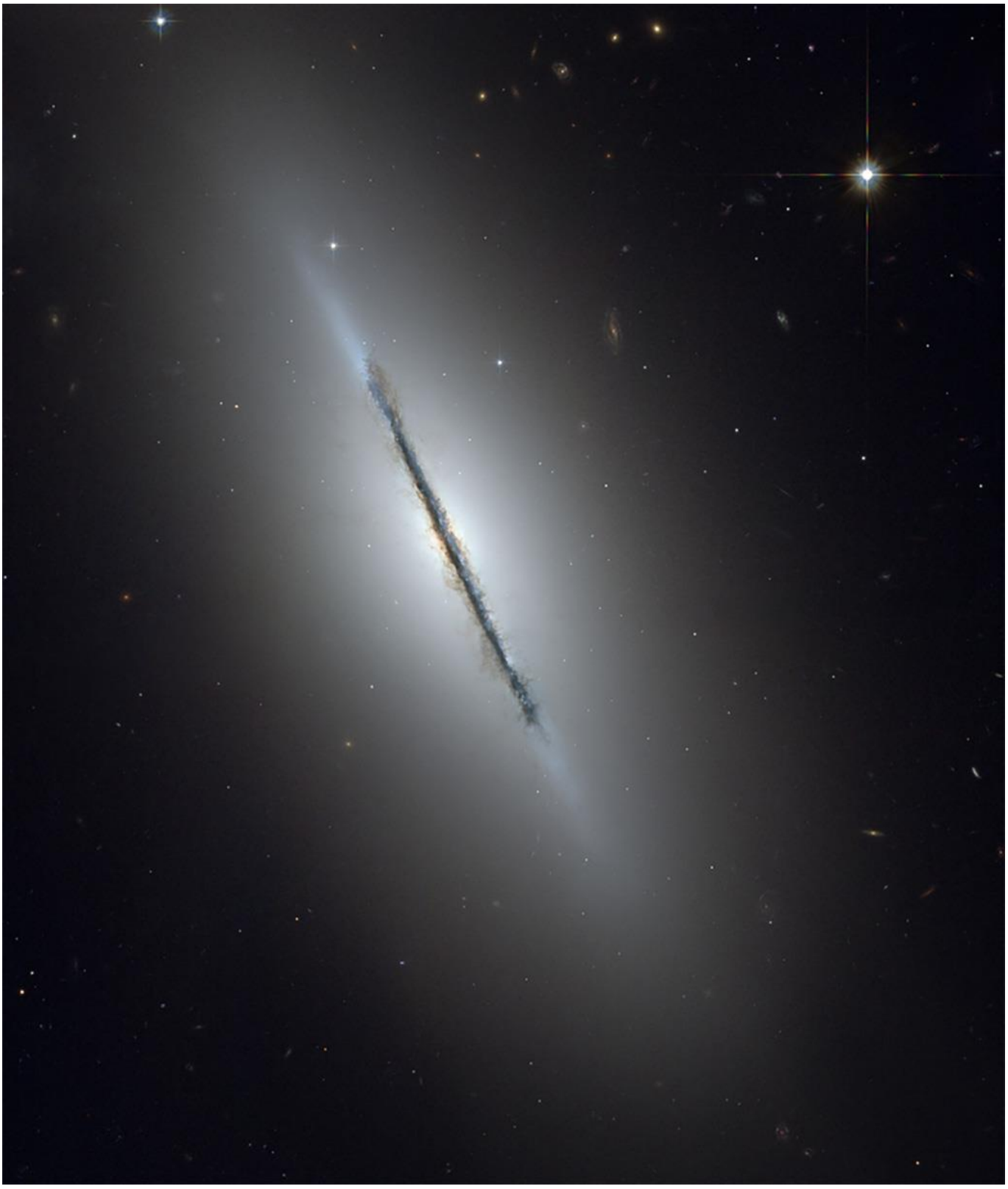
June is not the best time for observing really challenging Deep Sky objects from the Upper Northern Hemisphere, due to the Summer Solstice and the lack of true astronomical darkness, but there's still plenty to see, even if the sky is not at its darkest. Those readers in the Southern Hemisphere will have to forgive this rather Northerly-biased guide this month - rest assured, there's plenty of Southerly objects coming in July's guide!

Draco and Hercules. Image created with SkySafari 6 for Mac OS X, ©2014-2018 Simulation Curriculum Corp., skysafariastronomy.com.

We start almost as Northerly as one can get in the heavens, in Draco, the constellation of the Dragon, which winds its serpentine way around its polar neighbour, Ursa Minor. As many reader will no doubt be aware, the Pole Star of both hemispheres shifts due to the precessionary wobble of our Earth's axis. Whereas Polaris is now the closest visible star to the Northern Celestial Pole, in times past - around 6000-4100 hers ago, Thurban, Alpha Draconis was. Thurban is one of those seemingly disappointing Alpha-classed stars, as it is clearly fainter than others within Draco. It's possible that the fact that it was a Pole star is the reason it was treated with such reverence - it may be possible it was once brighter, though this in itself is less likely.

Despite being a large constellation, Draco has few Deep Sky highlights, in comparison to those that seemingly litter the constellations surrounding it. But those that it does have are interesting ones and well worth seeking out. The first of these is M102 or NGC5866, otherwise known as the Spindle Galaxy. The popular name is somewhat misleading as there are two other popularly-named “Spindle” galaxies, one in neighbouring Ursa Major and another in Sextans - though it definitely appears spindle-like in telescopes. M102 is an edge-on spiral galaxy, of +9.9 mag brightness and occupying an area of 6.5 x 3.1 arc minutes. Although it may not seem especially bright, its condensed nature means it can be found in relatively small telescopes and is excellently-seen in medium and large instruments, which can resolve the dark lane bisecting its core with ease. In this respect, M102 is very similar to NGC891 in Andromeda and NGC4565 in Coma Berenices.

M102 is one of the latter controversial Messier objects and its discoverer, Pierre Mechain later rather dismissively recanted its classification, claiming that the object in question was a mistaken duplication of the nearby M101. However, if we examine Mechain's original notes and the exact position of M102 as described by Messier himself, then it is clear M101 cannot match the reported object in question. Messier expert and Harvard Emeritus Professor of Astronomy Owen Gingerich put forward NGC5866 as a worthy "best fit" candidate for M102 after extensive study of Messier's original notes and the correspondence with Mechain. Thus, we now have a M102 to seek out and study ourselves. M102 lies around 40 million light years away from our galaxy.



M102, HST image (NASA/ESA). Public Domain.

Tracing a line NE from M102, through the stars Edasich (Iota Draconis), Eta Draconis and Aldhibah (Zeta Draconis). we come to a lovely planetary nebula, NGC6543, otherwise known as the Cat's Eye Nebula. This object is +8.1 mag in brightness and very compact - some 0.4 x 0.3 arc minutes diameter. As such it is relatively easy, even in small telescopes - though larger scopes will be needed to show its intricate internal structure.

The Cat's Eye is a greeny-blue in hue, a colour which is quite prominent even in smaller instruments. It's often remarked that The Cat's Eye looks a little like the Outer Gas Giants, Uranus or Neptune. What really marks NGC6543 as definitively *not* planetary is its central star. This star is +11 mag and can be somewhat difficult to spot, due to the condensed and bright nature of the surrounding nebula. Telescopic observation of the central star with averted vision reveals this nebula to be one of the so-called "blinking" planetaries - when moving one's vision from one part of the field to another, the nebula appears to blink on and off - disappearing from view.

Higher magnifications with larger telescopes reveal the internal looped structure of the inner part of the nebula. Observations by the Hubble Space Telescope have revealed much more than ground-based telescopes ever can: NGC6543 has several concentric shells of gas (see image above), which suggest a series of layers have lived off the surface of the central star, which in turn have been whipped into two 180 degree spaced jets, which give the nebula its somewhat oval shape. It is theorised that these jets are actually a sign of an unseen secondary companion and represent the poles of its rotation. This cannot be confirmed as yet, but the Cat's Nebula gives astronomers the one of the best opportunities to study the dying phases of a star like our Sun. NGC6543 lies around 3000 light years away from us and as such is one of our closest planetary nebulae - and also one of the youngest: observations suggest that it has been undergoing expansion and formation over the past 1000 years.

The Cat's Eye Nebula, Hubble Space Telescope image, ESA/NASA. Public Domain.

Moving South - by just over 24 degrees - through Rastaban, Beta Draconis, one of the four stars which represent Draco's head, across the border into Hercules, we come to one of the finest Globular Clusters in the sky, M92.

Discovered in 1777 by Bode, Messier was to independently discover it and add it to his catalogue in 1781. While it is somewhat overlooked in favour of the more illustrious M13 (more of which later), M92 is a spectacular object in its own right and can be found in binoculars and small telescopes easily. Under very dark conditions, it can actually be seen which the naked eye - at +6.44 mag it is just within theoretical naked eye visibility, though this must surely only be possible with averted vision. It is well condensed as a target, being

around 2 arc seconds in diameter, which helps keep its surface brightness up. Binoculars of modest power will resolve the grainy texture of this globular extremely well - indeed, it is one of the best deep sky objects of its type for observation in binoculars. If the binocular view of M92 is excellent, then telescopically, M92 is spectacular. Small telescopes will resolve the cluster into individual stars relatively easily, whereas larger scopes will really do it justice.

Lying around 26,000 light years distance, M92 has a curious "part time" job - every 26,000 years, it becomes the marker for the Northern Celestial Pole. Our Earth's precession, causing the polar shift, next brings the pole to within a degree of M92 in 16,000 CE.

M92 by Mark Blundell. Image used with kind permission.

Those with larger telescopes may wish to try their luck with a much further globular cluster, NGC6229. This cluster is much fainter than its neighbour and is to be found just under 7 degrees to the NW of M92. This would be a similarly awesome sight as its neighbours, were it not for its distance - which is reckoned to be around 100,000 light years. NGC6229 was discovered by Sir William Herschel in 1787 and was initially thought to be a planetary nebula. 19th century observations proved it to be broader in spectral signature and thus a collection of stars. It will take a reasonably large scope to resolve NGC6229 into individual stars, but this will be a comparatively simpler task when imaging the object.

NGC6229 relative position in Hercules. Image created with SkySafari 6 for Mac OS X, ©2014-2018 Simulation Curriculum Corp., skysafariastronomy.com.

Whereas NGC6229 is really the preserve of larger instruments or imagers, the next object on our list for observing is quite simply for everyone - quite simply the finest globular cluster in the Northern Hemisphere, the wonderful M13.

M13 is within naked eye reach at +5.78 mag and was first noted by Sir Edmund Halley in 1714 as "a nebula [which] shows itself to the naked eye when the sky is serene and the Moon

absent". Messier himself logged it in his catalogue in 1764 and Sir William Herschel wrote of M13 "[it is] a most beautiful cluster of stars, exceedingly compressed in the middle and very rich."

M13's popularity is not solely down to its beauty - it's also exceptionally easy to locate, lying as it does in the "Keystone" of Hercules. This central asterism of four stars, Zeta, Eta, Epsilon and Pi Herculis mark the Keystone, which represents the head of the Demigod. M13 can be found 2 1/2 degrees to the South of Eta, following the Western side of the Keystone down to Zeta. Once found, M13 will never be forgotten, as it is a marvellous object in both binoculars and any type of telescope. Larger instruments will be able to resolve M13 easily into individual stars and give an observer the chance to spot the "Propellor" feature. The Propellor is more easily seen in long duration photos and is common to a few globular clusters. It is an area on the cluster in which a simple line of sight effect emphasises a lower density concentration of stars. Human nature and cognition being what it is, this area is generally agreed to look like a three-bladed aircraft propellor, slightly silhouetted amongst the background stars.

The stars of M13 are very old, predominantly red stars, which have, in all probability, been gravitationally bound since just after the formation of the Milky Way itself. Globular clusters in general are very metal poor, being so ancient - and the Iron content of the cluster on average is just 5% that of our Sun. Our own Solar System, being barely more than a third of the age of M13 has benefitted immensely from the recycling of metals manufactured in the death throes of previous stars. Our own Earth's core being part of this process, along with a very large amount of Iron that goes into our own physical makeup. Any possible lifeforms which have evolved on planets around stars in clusters like M13 may well not have had access to metals in such abundance as life on our planet does, which would have required different biological strategies and processes to that which fuels a large amount of complex life on Earth. These potential inhabitants of M13 would have an amazing night time sky though, as the heavens would be littered with hundreds (if not thousands) of stars brighter than the 1st magnitude - quite a view!

At around 125 light years across, M13 is not the largest of our galaxy's Globular clusters (this prize must surely go to Omega Centauri), but nonetheless a very healthy size. It is so prominent from our neck of the cosmic woods simply because it is relatively close, at around 25,000 light years away. However, this is still not quite as nearby as Omega Centauri, which lies around 10,000 light years closer and the two closest Globulars, M4 in Scorpius and NGC6397 in Ara, both of which are found around 7,200 light years from us.

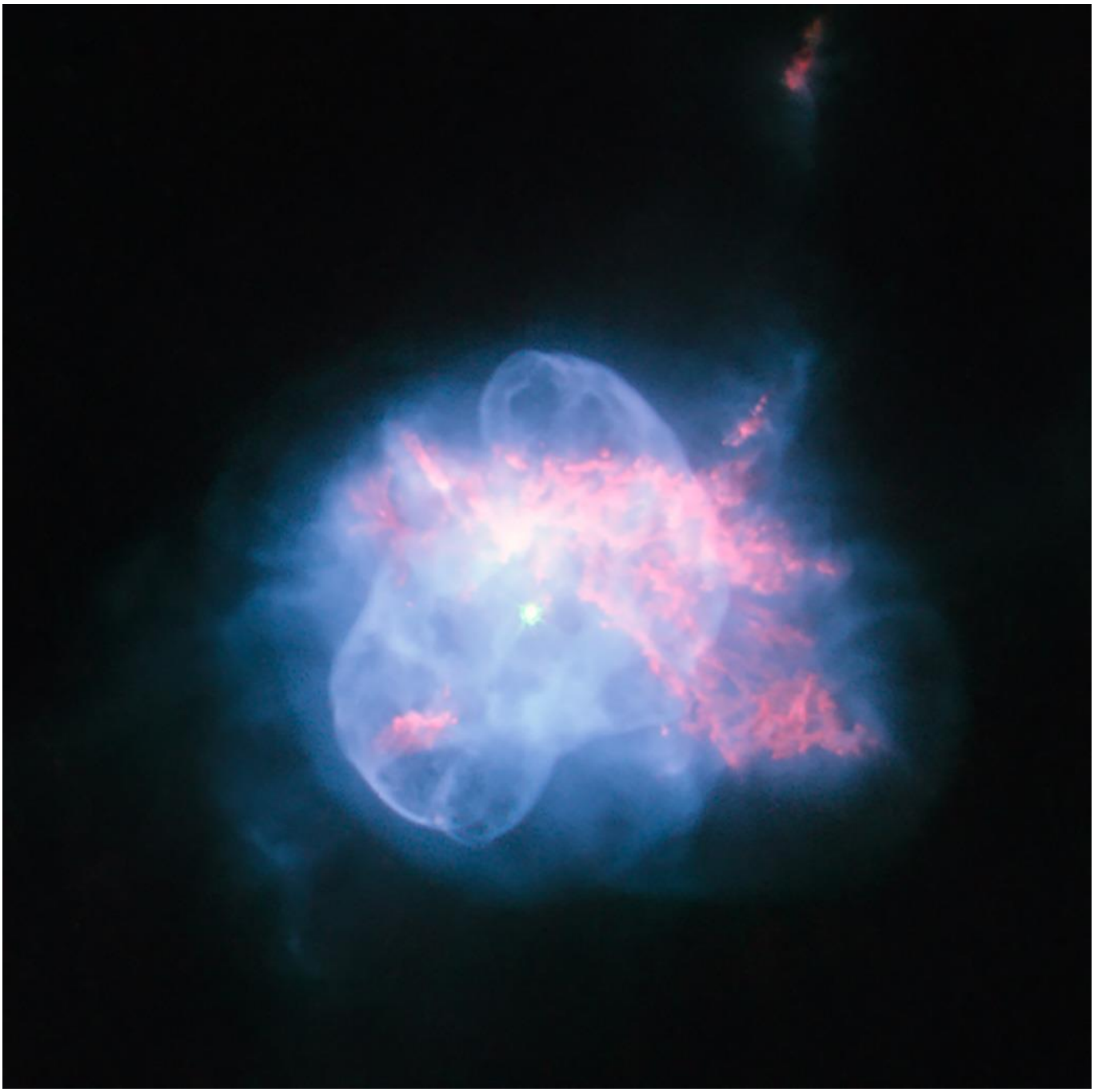
If you're a seasoned observer, the arrival of M13 overhead in the Summer evening sky is a welcome return of an old friend. If you're a beginner, this wonderful cluster awaits your discovery - it'll be an object you come back to time and time again, as it never disappoints.

M13 taken by Mark Blundell. Image used with kind permission.

The last of the objects on our wander around this area of sky is another Planetary nebula - NGC6210.

At +8.8 mag and 0.3 x 0.2 arc minutes diameter, this nebula is similar in brightness and dimension to the Cat's Eye Nebula in Draco, though is somewhat less well-known. This is a pity, as it's not a difficult object to pick up in small telescopes and rewards high magnification. This nebula can be found 4 degrees to the NW of Kornephoros, Beta Herculis, which at +2.77 mag is the brightest star in Hercules . NGC6210 has, like the Cat's Eye, high surface brightness, due to its compact nature and this manifests itself in a beautiful blue coloration. Like most planetary nebulae, this target is complimented greatly by observing it through an OIII filter, as the ionised Oxygen in its outer layers is easy to isolate and our mammalian eyes are most sensitive to greens and blues at low light levels. The nebula shows itself to be a distorted oval shape, though larger telescopes of the 10-inch + class may well be able to distinguish a larger faintly glowing outer halo of gas, if conditions are favourable. Like the Cat's Eye, NGC6210 has quite a complicated internal structure, which the Hubble Space Telescope's picture below aptly illustrates.

NGC6210 was first discovered by the German-Danish Astronomer Friedrich Georg Wilhelm von Struve in 1825, while working at the observatory at the Imperial University of Dorpat in Russia. Struve is best known for his immense work cataloguing double stars, many of which are still popularly referred to by their Struve classification. Mysteriously, despite this area of sky being surveyed by Mechain, Messier, both William and John Herschel and numerous other experienced observers, it was Struve who first noted this relatively easy-to-spot planetary. Although a challenge due to its diminutive size, NGC6210 is not a difficult target for anyone with a telescope - so why not have a go yourself?



NGC6210 - Hubble Space Telescope Image (NASA/ESA). Public Domain.