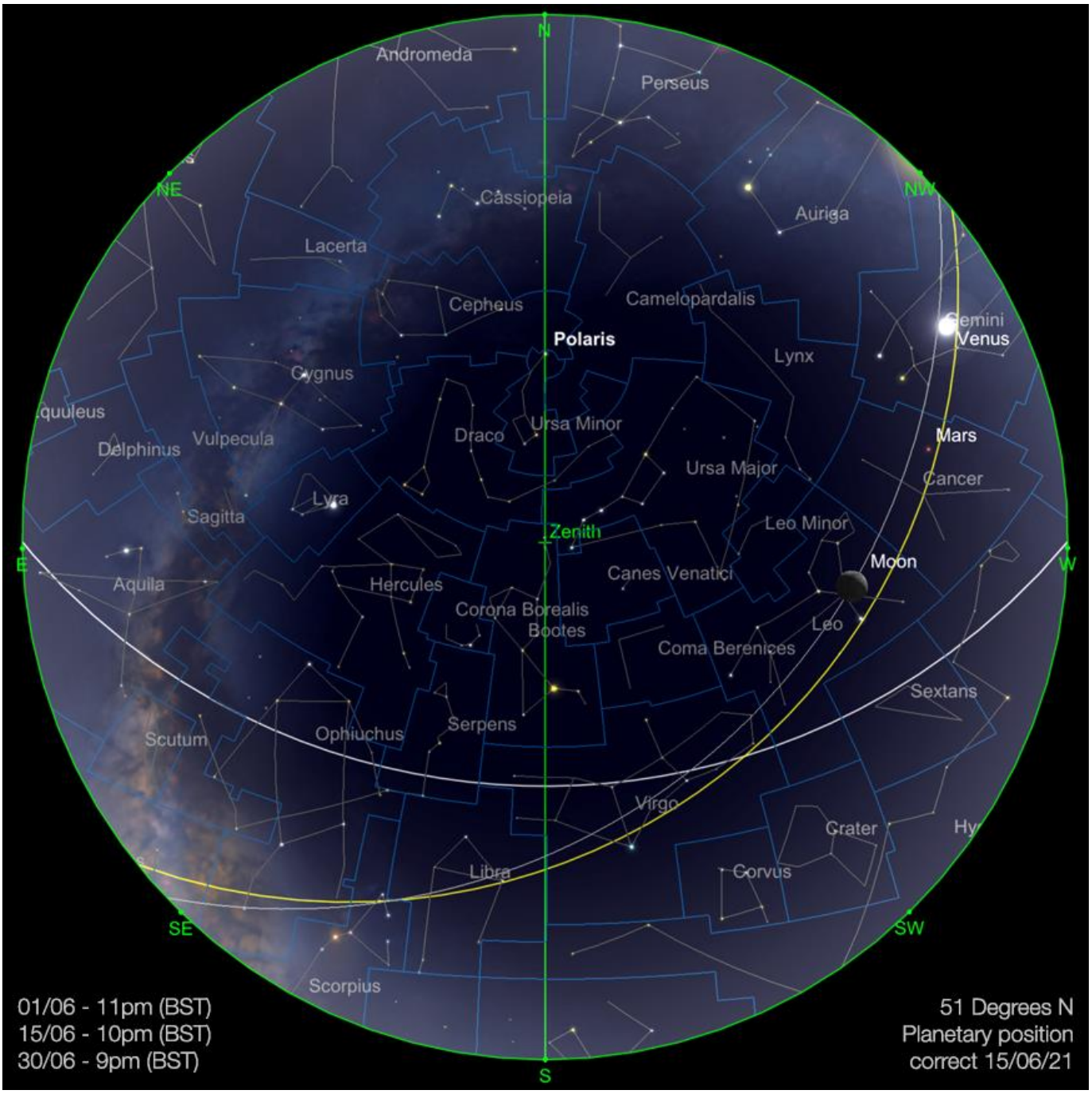
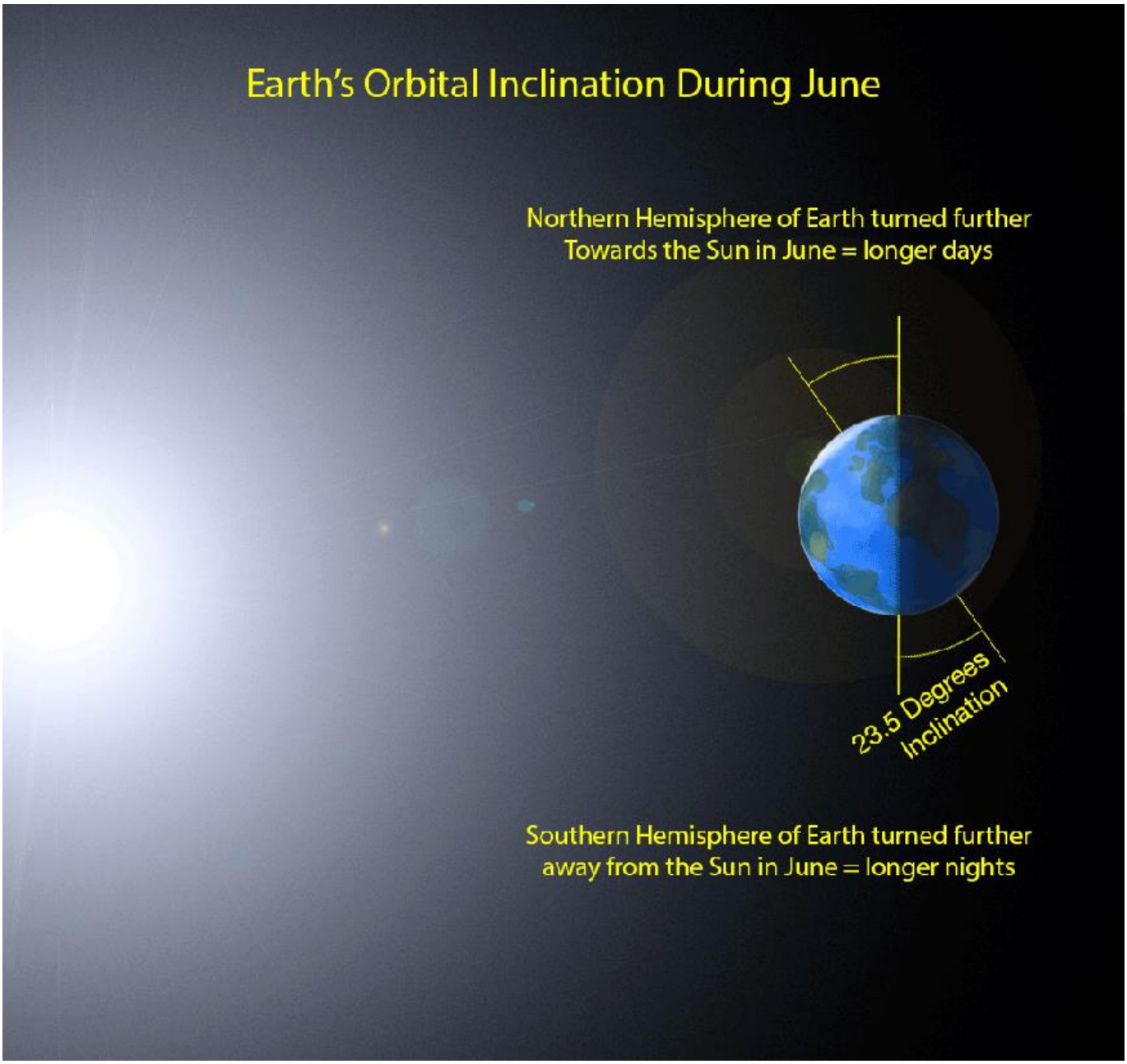


June is significant for Astronomers in may ways. For those of us who find ourselves in the Northern Hemisphere, June is the lightest part of the year. This owes itself to the Summer Solstice falling on the 21st June for the Northern Hemisphere. At this point, the Sun reaches the most northerly point in the Ecliptic and its highest separation from the horizon at Midday. Of course, for every action, there's an equal and opposite reaction - while we Northerners bask in the glory of Midsummer, those in the Southern Hemisphere are in the grip of Midwinter. The cause of these extremes - and all our seasonal weather on Earth - is our planets' rotational tilt (around 23.5 degrees from vertical) in comparison to the plane of our orbital path around the Sun. During the Summer time, the leading hemisphere is pointed towards the Sun, thus receiving more light to warm up the land and sea. Days are subsequently longer and nights are shorter, the further towards the pole you find yourself. In Midsummer, those above the Arctic Circle experience 24 hour daylight. Of course, the opposite is true for all of this if you find yourself in the trailing hemisphere.



This has noticeable effects on the quality of darkness for those in temperate Northern latitudes, as during this point of the year, the Sun, even at the deepest point of the night is not so far below the horizon. For those in the Northern Europe and the Northern parts of the USA and Canada and Asia, this can mean permanent Astronomical Twilight for a while around the Summer Solstice.

From the 27th of May to 15th July 2021, there is a state of permanent Astronomical Twilight for those in Southern UK latitudes (around 50.5 degrees N), which means that the Sun is less than 18 degrees below the horizon all night long. This means that the skies are never truly dark and that objects around or below the 6th magnitude are unable to be distinguished with the naked eye (technically, +6.5 mag is generally seen as the limit of human eyesight, though this does vary from individual to individual). This obviously has knock-on effects for deep sky observation and astrophotography. The further north one observes from, the longer this period of permanent Astronomical Twilight persists: in Manchester UK (latitude 53.5 degrees N) this extends from mid-May to the end of July; in Edinburgh (just shy of 56 degrees N) the period is yet longer, from early May to the end of the first week of August. Do bear in mind, if you find yourself in latitudes similar to Reykjavik, Iceland (64 degrees N) Astronomical Twilight persists from early April to the beginning

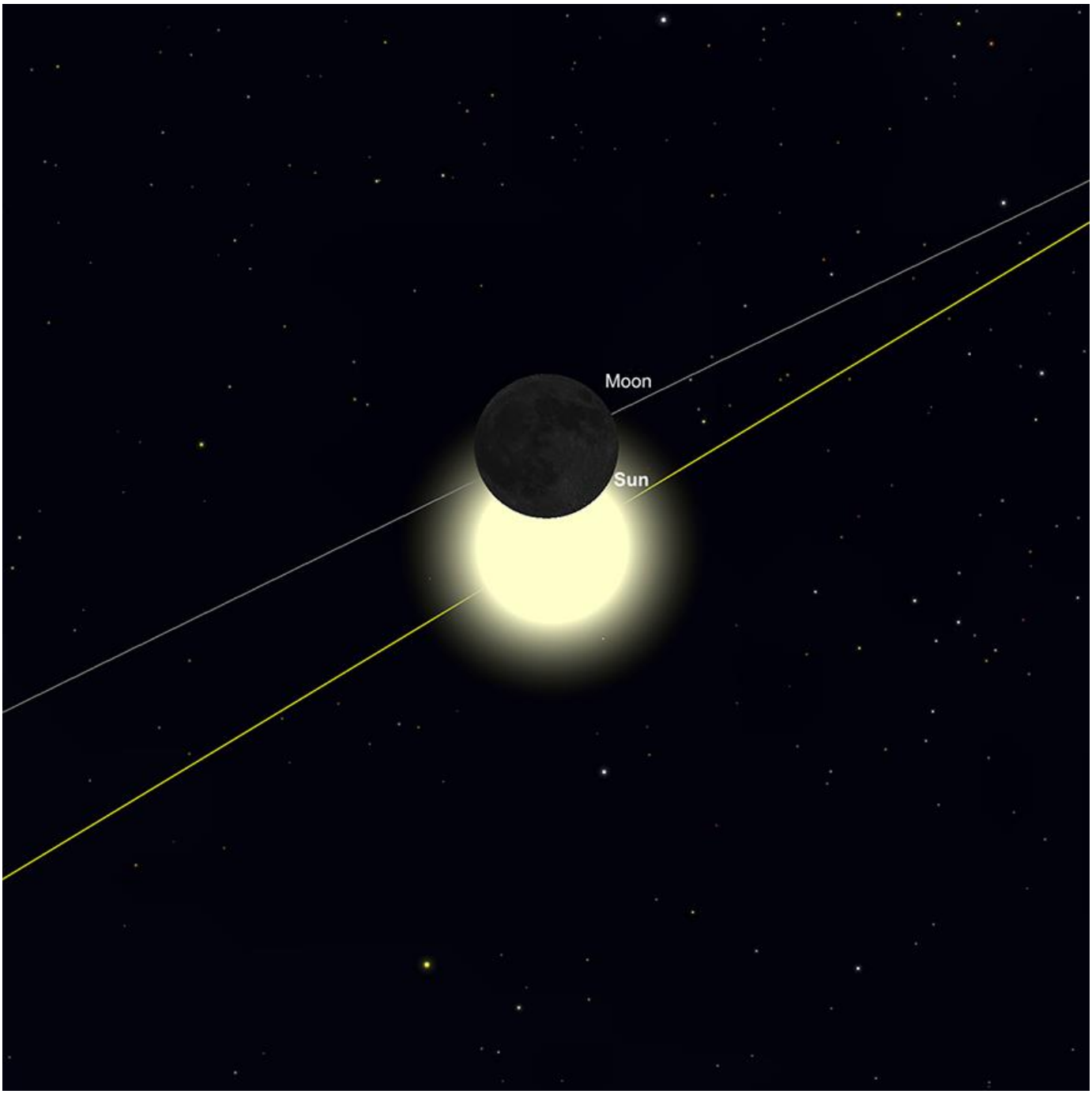
of September . North of the Arctic Circle, the Sun will not set at all around the Solstice, whereas south of the Antarctic Circle, the Sun won't rise at all during this period.

The Solar System

The Sun

It's rare that we cover the Sun in the monthly sky guide, which doesn't mean that it is without interest! However, this month brings a significant event that is well worth commenting on. On 10th June the track of an Annular Solar Eclipse will cut a swathe through the Northern Canada, Greenland, the extreme East of Russia and the Arctic Ocean. Although only those on the central track will witness the eclipse's Annular Totality (which in itself isn't fully Total, an Annular Eclipse showing a "Ring of Fire" of the extreme edges of the Sun during its most "total" part), it will be visible as a partial eclipse over a huge area, which will take in the large parts of the Eastern USA, Canada, much of Greenland and of the North Atlantic Ocean, including Iceland and most of Europe and Russia. Large parts of Central Asia will see it too. China, Mongolia and Tibet will witness a the eclipse later in the day (owing to difference in relative time zones) and the event will even glance the tip of Morocco in Africa (but will be invisible to the vast majority of Africa and the Middle East). As such, assuming reasonable weather, this eclipse stands a good chance of being very widely-observed.

For those in Europe, the eclipse reaches its maximum point in the late morning or around midday. For those in the UK, the Eclipse starts at around 10am with first contact, reaches its maximum at just after 11am and ends a little after 12pm. It is always worth re-emphasising the old adage: do not attempt to observe the Sun without proper filtration. Sunglasses, smoked glass, welders glasses are not enough - you will need to use properly certified solar film, solar polymer filers or glass solar filters. Of course, H-Alpha and Calcium-K or Herschel Wedge equipped telescopes are perfectly safe to use, though do check the internal makeup particular instrument you're using before installing a Calcium-K or Herschel Wedge - these two should only really be installed in refracting telescopes of under 4-or-so inches of aperture. If you've got a reflector, then a full aperture white light filter or film is recommended. A dedicated solar scope such as those available from Lunt Solar Systems are the safest bet for long term solar observations - as these will also show spectacular solar prominences and other atmospherics. Solar Eclipse glasses are also available, though if you're trying to observe the extreme beginning and end of the partial eclipse from Europe, white light solar binoculars will be needed at the very least to provide the magnification required to observe these parts of the event.



The Moon and Sun in mid-Partial Eclipse, June 10th 2021. Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

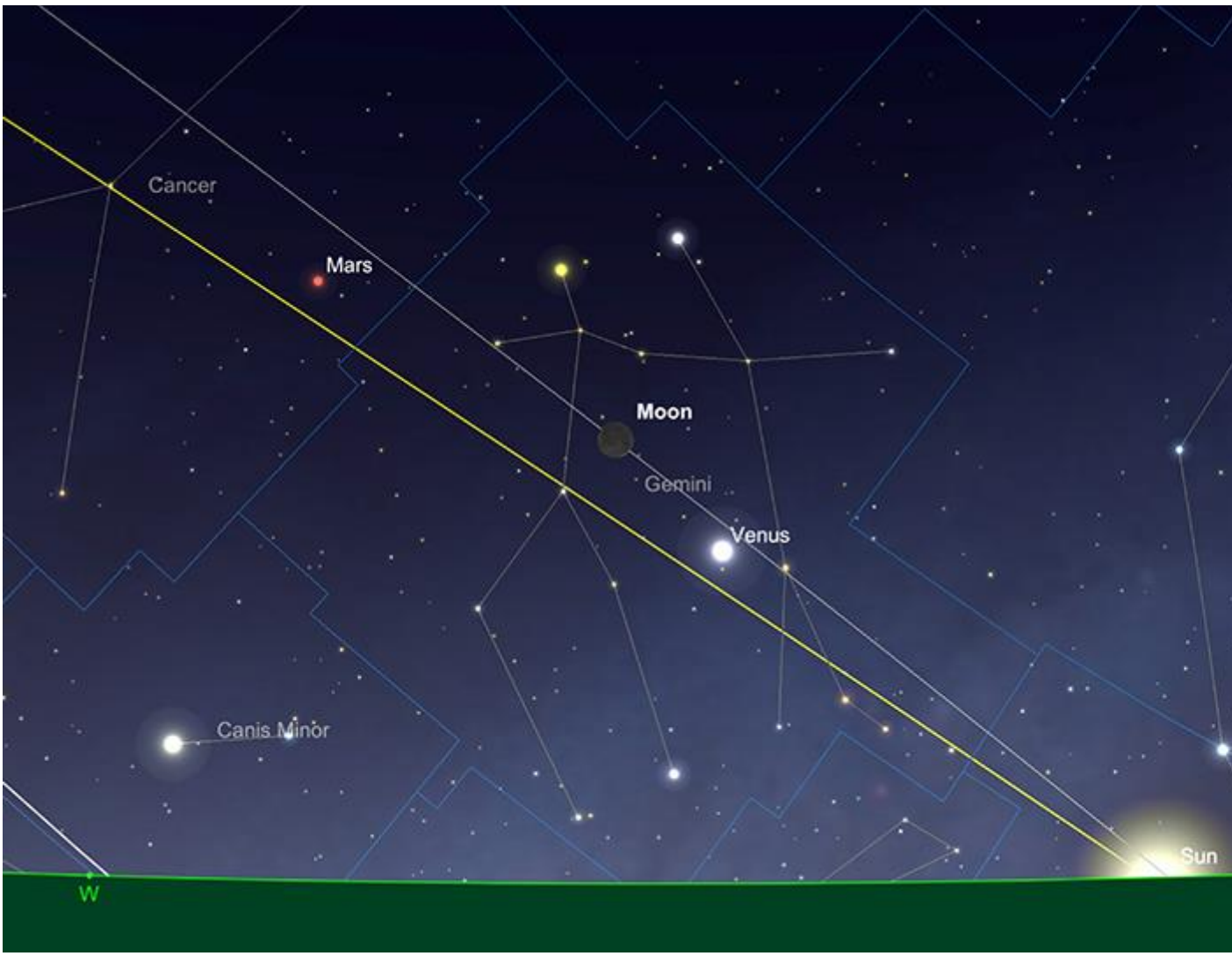
Unlike some recent partial eclipses, this shouldn't be a challenging event (clouds aside) to witness from European locations, given the time of day it occurs. The Sun and Moon will be at a decent observing elevation and we at Telescope House will be on the lookout. If you decide to as well, we wish you good fortune in the attempt, but urge you to remember our solar safety warnings. No matter where you find yourself, if you have any pictures you'd like to share, please send them to us, we'd love to feature them in next month's Sky Guide.

The Moon

The Moon starts June on the Capricornus-Aquarius borders, at a 63% Waning phase. Rising at a little after 2am (BST) from the UK, the Moon will be found just over 6 degrees below Jupiter, with the two bodies transiting in the south a little before 7am during the early part of the month (this occurs after the Sun has risen)

The Moon will reach New in Taurus on the 10th and as previously covered this New Moon will also cause an Annular Eclipse of the Sun. It's worth stating for less experienced readers that Solar Eclipses can only occur when the Moon is New and subsequently found on the "Sunward" side of its orbit around the Earth.

From this point, the Moon becomes an evening object and may just be found a few days later Venus in Gemini, though you will need clear horizons and decent observing conditions to see the tiny sliver of the Moon alongside the planet in the early evening of the 12th.



The Moon alongside Venus, sunset, 12th June. Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

Although we are now past the point of the High Spring Crescent phase of early evening observations of the Moon, June still gives us plenty of opportunity to see the Moon at reasonable altitude in the sky,(from a northern hemisphere perspective), being found in the more northerly parts of the ecliptic in the evenings at this point in time. The Crescent Moon moves through Gemini and Cancer and on into Leo, during the next few days. It is in Virgo, on the 18th, where we find the Moon back at First Quarter, transiting at a little under an hour and half before sunset.

The Waxing Gibbous Moon imaged by Malcolm Porter, using an Explore Scientific David H Levy Comet Hunter 152mm f/4.8 Maksutov-Newtonian and a Canon Ra (ISO 800, 1/2000th second). Image used with kind permission.

The Moon will reach Full on the 24th, when it will be found in the constellation of non-zodiacal constellation of Ophiuchus. This is another of the popularly-called “Supermoons” - more properly described as a Perigee-Syzygy Moon. This occurs a few times a year when the Moon reaches Full Phase at its closest point to Earth. While there’s no great scientific importance to this, the Moon can look a little larger than usual, though this perception is often enhanced further by atmospheric lensing effect when he Moon is viewed when rising, when it’s lower in the sky. Sadly, as potentially exciting to beginners a “Supermoon” may sound, the Moon at Full phase is actually the worst time to observe it, as surface relief is bleached out by the Sun sitting directly behind us as we observe it from the surface of the Earth. Those using a telescope will often need a Moon filter to deaden down the glare and reveal a little more surface detail when the Moon is Full. While Full Moon is not the greatest time to observe the majority of its surface, use this time to check out extreme edges of the Moon and see what discoveries you can make.

Naturally, around the end of June isn’t the greatest part of the month for visual deep sky observations, or imaging without narrowband filtration - though the lack of true darkness at this time of year is also a major challenge in this department. After becoming Full, the Moon will continue its sedate path through the descending southern section of the Ecliptic, into Sagittarius, until it begins to climb back northwards, through Capricornus - rising in the early morning of the 28th, when early-rising observers will find it lined up in a row alongside Jupiter and Saturn in eastern dawn sky.

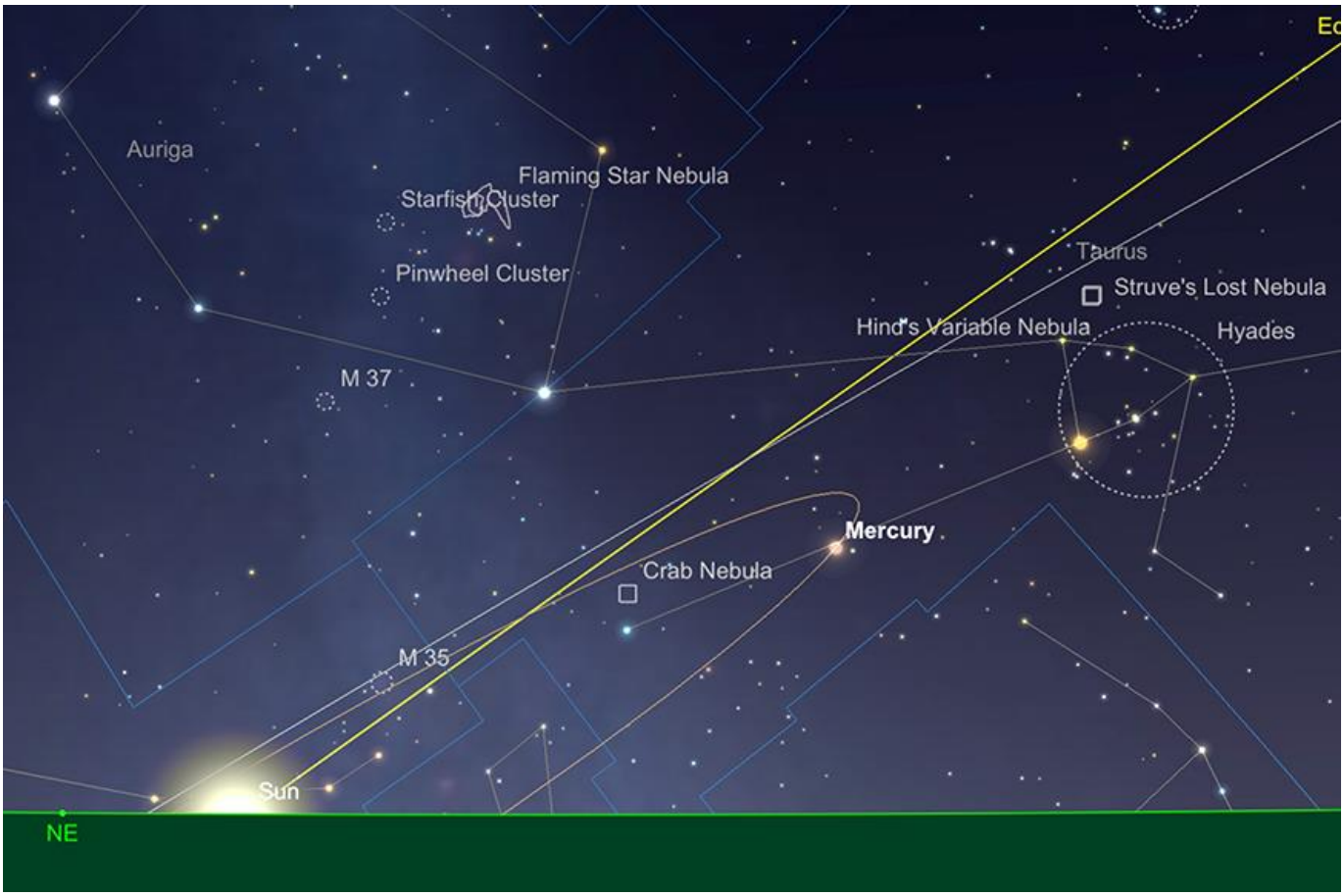
We leave the Moon on the 30th back in Aquarius, just a day shy of Last Quarter.

Mercury

The beginning of the month is a poor time for potentially observing Mercury. It is currently arcing its waySunward and the 1st finds it at a very acute phase of just 6.5% illumination and at the equivalent of magnitude +3.3 will be unobservable.

The planet reaches Inferior Conjunction - between the Earth and the Sun - on the day of the eclipse, 10th June, after which it will re-emerge in the morning sky.

As we well know, nothing stays the same as far as Mercury is concerned. A planet with an 88 day year won’t stay in the same place for long. By the end of June, Mercury will be at a respectable +1.1 magnitude, showing a 25% phase. It will be found just under 8 degrees high in the east at sunrise on the 30th. Over the first couple of weeks of July, it will brighten yet further and while not quite as well-placed for observations as recent evening apparitions, will be seen respectably from the northern hemisphere.



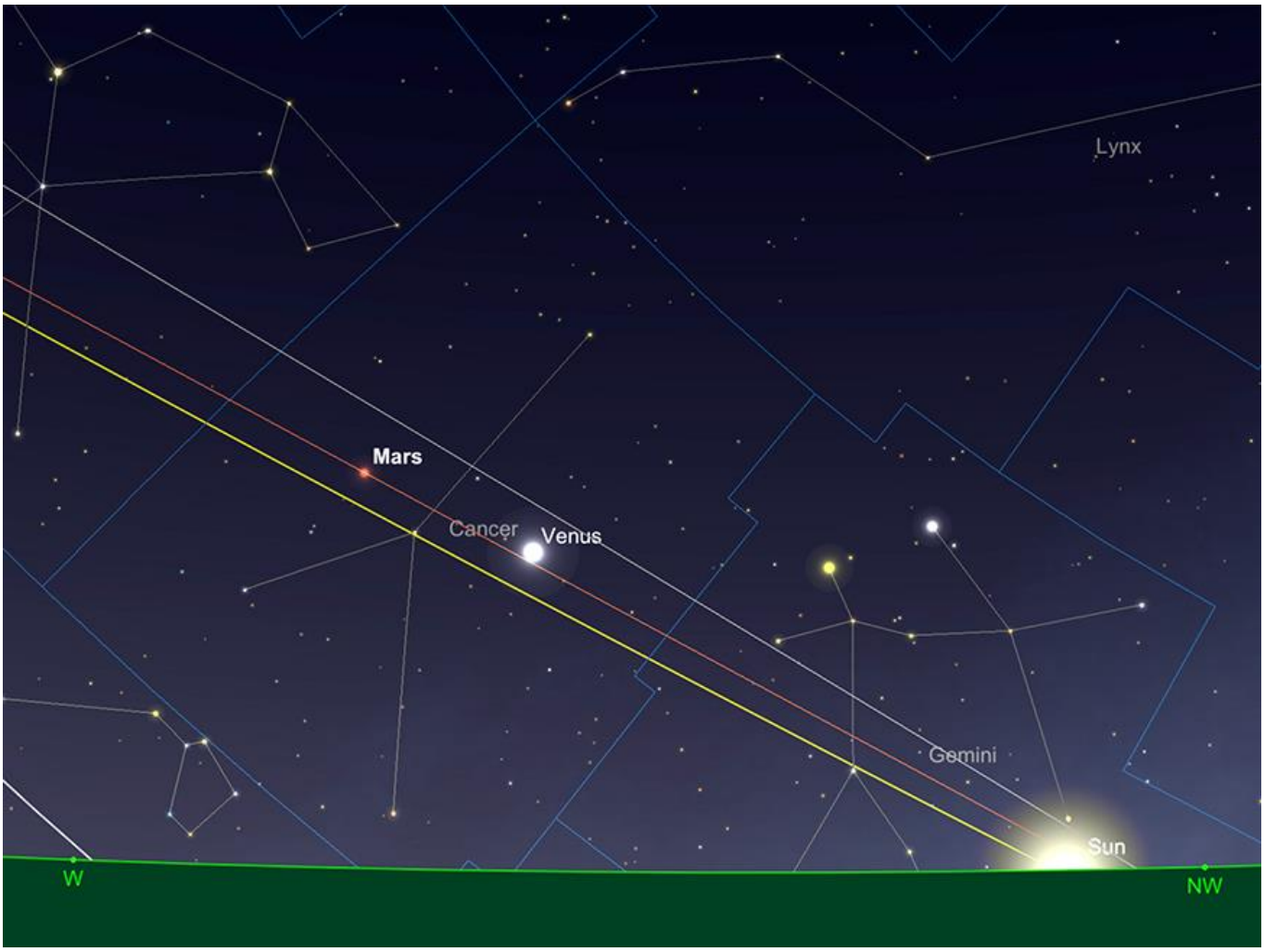
Mercury, sunrise, 30th June. Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

Venus

Venus is an evening object and can be found in Taurus at the beginning of June shining at a distinctive -3.9 magnitude. At 10.3 arc seconds diameter and showing a 95% illuminated disk, the planet will certainly be distinctive for those with clear westerly horizons, though sitting at just over 11 degrees altitude (from 51 degrees N) at sunset on the 1st won't be in the best place to be observed by those of us in higher northern latitudes.

By mid-June not much has changed as far as Venus is concerned. It is still -3.9 mag and showing a fractionally larger disk than that presented at the month's beginning. Although increasing angular distance from the Sun, Venus is approaching the highest northerly point in the Ecliptic and it will soon start dipping towards the horizon again, as seen from more northerly climes, making observations even more challenging.

By the end of the month, Venus will be in Cancer and keeping the much fainter Mars company. Still at -3.9 mag, it is now 11.2 arc seconds in diameter and sits at just over 12 degrees high (from 51 degrees N) in the west at Sunset.



Venus and Mars, sunset, 30th June. Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

Mars

The Red Planet is a rather pitiful sight in Gemini at the month's beginning. At +1.7 mag and just 4.1 arc seconds diameter, it sits just over 24.5 degrees high (from 51 degrees N) in the west at sunset. At this point in the Martian cycle, disappointment reigns if you try and find it in a telescope.

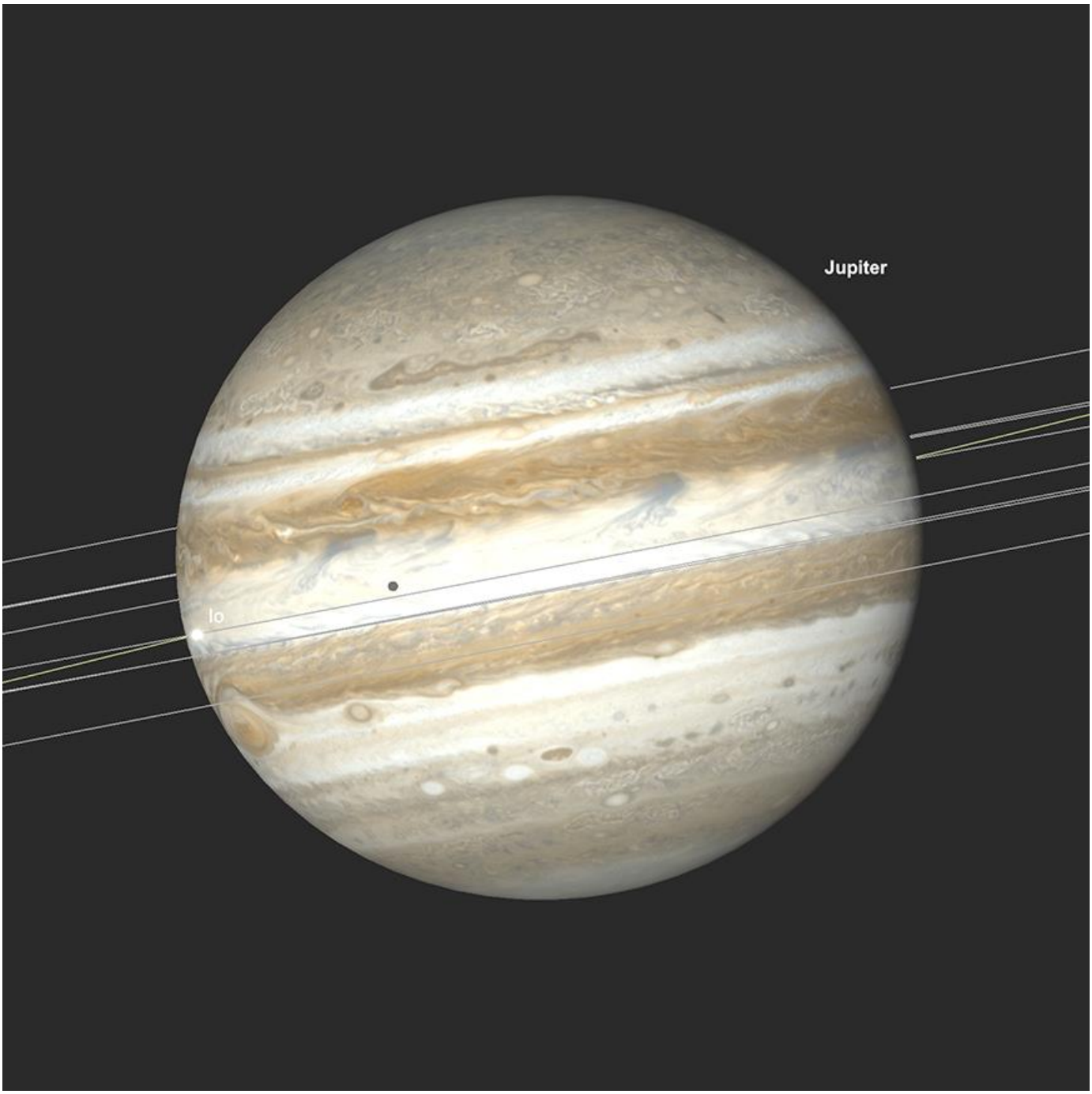
By the end of June, as previously reported, it can be found in Cancer alongside the much brighter Venus. Indeed, if you didn't know it was Mars you were looking at, you could easily mistake it for a medium brightness naked eye star. As Cancer contains no really bright stars, Mars will be noticeable if you know where to look, but Venus outshines it by such a vast amount, it will be easy to miss.

Jupiter

The ever-reliable Jupiter is a great target in the mornings and is now found at 23 degrees elevation in the SE as the day begins. At -2.4 magnitude and 41.2 arc seconds across it will be a great sight in telescopes and will continue to improve in the run up to August's Opposition.

As we reported with Saturn last month, Jupiter will start to go retrograde in the latter part of the month, a sure precursor of Opposition. This occurs beyond the 21st June this year, after which point the planet will appear to move backwards against its usual “proper” motion through the sky. This is caused by our “catching up” with the outer body on our faster interior orbit, causing the angle at which we observe the outer body in relation to the background stars to change. The analogy of catching up and undertaking a car and noting its apparent motion, relative to the car you are travelling in, is a simple version of what’s happening here. Of course, the outer planet never actually changes its orbital course, but apparent retrograde motion is a clear demonstration of the visual effects of orbital dynamics at work and as such a clear demonstration of the way our Solar System works and our place within it. While we’re still some time away from Jovian Opposition, which occurs on the 20th August this year, the retrograde motion of any of the outer planets is always a sign that this is upcoming.

We end June with Jupiter showing a 45.1 arc second diameter disk, having increased brightness a little to -2.6 magnitude. The King of the Planets now sits just under 28 degrees high in the south (from 51 degrees N) as the Sun rises, having transited just a few minutes before this.



Jupiter at the beginning of a multiple Great Red Spot, Io and Io Shadow Transit, 1am (BST), 28th June. Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

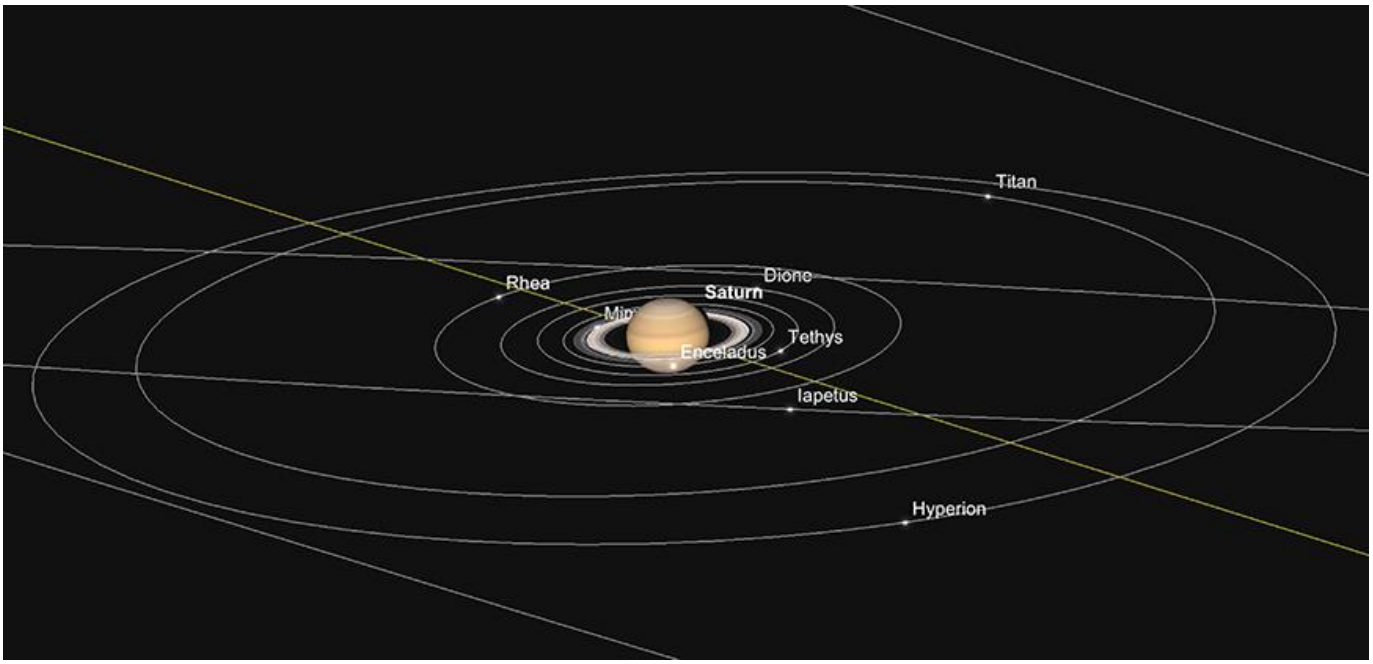
Saturn

18 degrees to the east of Jupiter on the 1st, Saturn, like its neighbour is a morning target. Found in Capricornus, as ever, Saturn presents itself as a much less immediately noticeable object than Jupiter, though is by far the brightest “star” in the constellation. Once found, Saturn’s creamy-yellow colour is unmistakable and magnifications of just over 40x will start to reveal the rings for which it is so famous.

On the 1st, Saturn presents a 17.6 arc second diameter disk, shining it a steady +0.6 mag. A little optical aid will easily reveal Titan, Saturn's largest Moon and a little more aperture will reveal other members of Saturn's retinue of moons - though observations of these will have to wait until a little later in the year when Saturn can be seen with a darker background sky.

Those looking at Saturn through a telescope will note that the ring system, which had appeared wide open over the past few years, as Saturn moved through the extreme south of the Ecliptic, from our perspective here on Earth, are now closing and while unmistakable are not as wide as they have appeared in recent years. The angle of the rings does affect Saturn's maximum brightness around Opposition, so this year's maximum brightness will not be quite as high as though of recent years. Other things - most noticeably sheer distance between Earth and Saturn and its subsequent angular size can also affect maximum brightness. But it is interesting to note that the angle of the ring system, while being invisible to the naked eye, can still affect the perceived naked eye brightness of Saturn when observed from Earth.

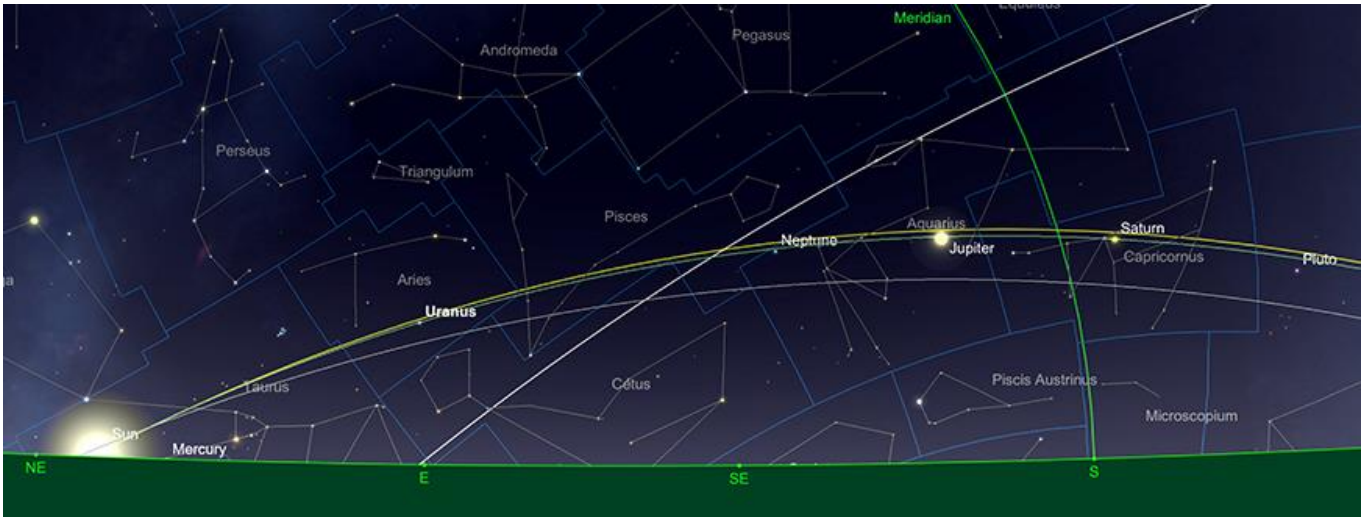
Saturn ends June having brightened a little to +0.4 mag and now displays a 18.3 arc seconds diameter disk. It will stand just over 19 degrees high in the SSW at sunrise (from 51 degrees N).



Saturn and Inner Moons, just before sunrise, 15th June. Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

Uranus and Neptune

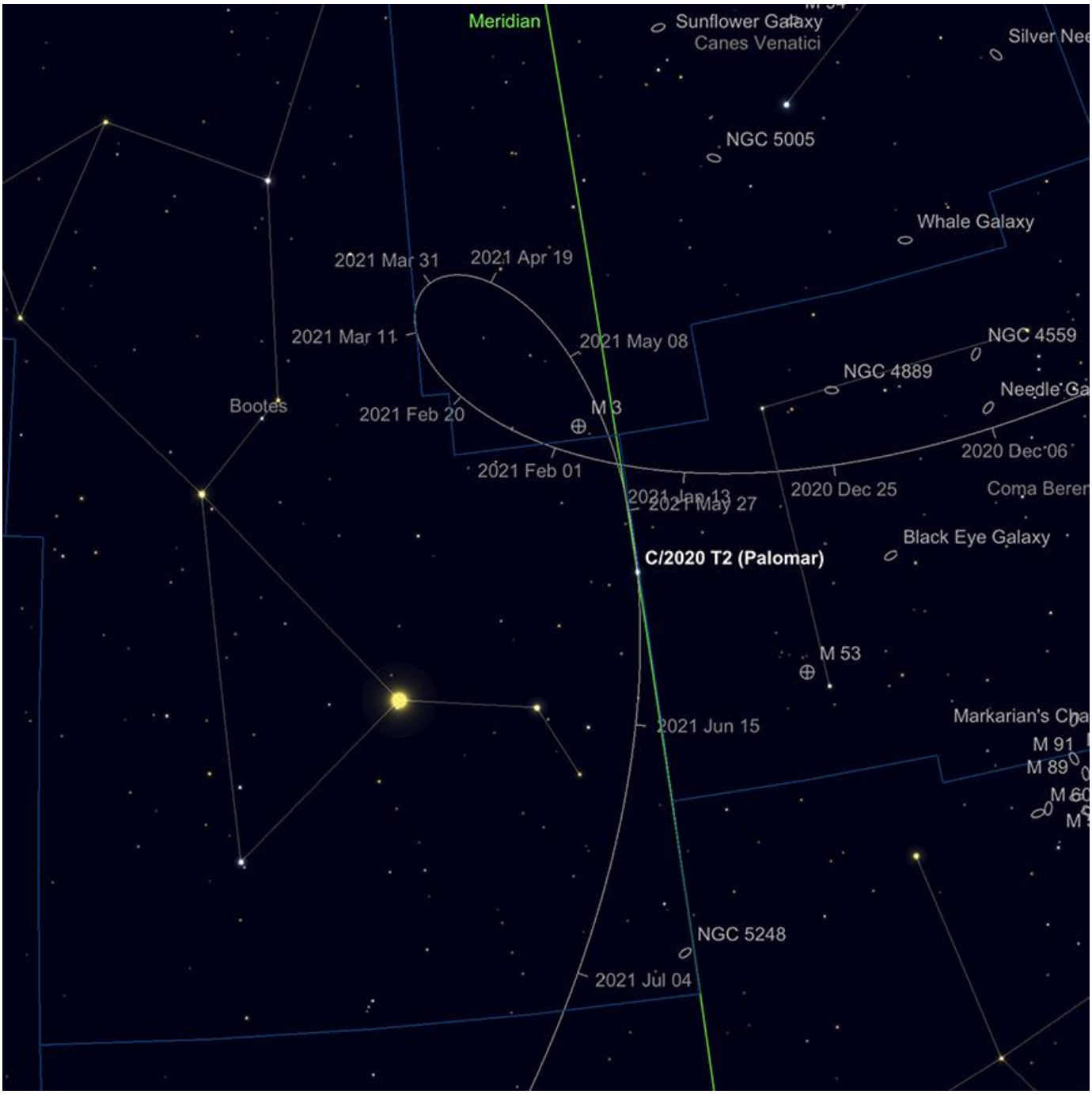
Both morning objects, Uranus and Neptune are not particularly easy targets during June. Neptune, at +7.9 magnitude, being that much further east in the Ecliptic in Aquarius, will rise earlier and attain a decent height from the horizon before daybreak. Uranus, on the other hand, while brighter at +5.9 mag, is still slowly emerging from Superior Conjunction, so will be much less favourably placed for moving observation, attaining just over 27 degrees height at sunrise on the 30th (from 51 degrees N). The lighter night skies in the higher northern latitudes at this time of year makes finding both planets a little more challenging than they would be at other times.



Relative positions of Uranus and Neptune, sunrise, 15th June. Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

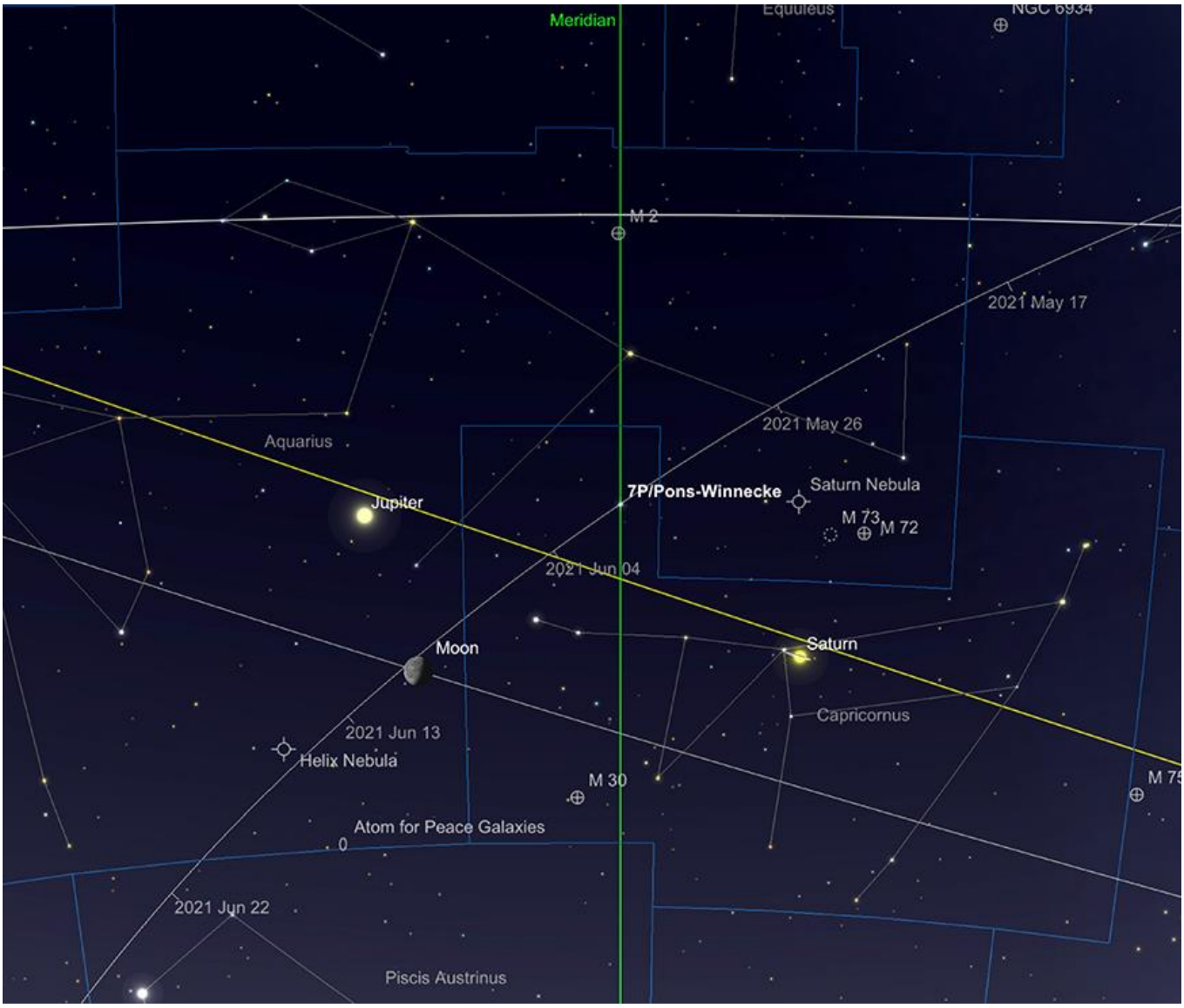
Comets

There are no really bright comets visible at present. However both comets C/2020 T2 (Palomar) and the periodic comet 7/P Pons-Winnecke are visible in telescopes and large binoculars. At around 10th magnitude, both objects will be visible in very different parts of the night. C/2020 T2 can be found tracking south through Bootes during June and will be visible for much of the night.



C/2020 T2 (Palomar) path through Bootes, June (comet position shown 1st June). Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

Pons-Winnecke will not rise until 1am in Capricornus and will track south through neighbouring Aquarius and further south into Pisces Austrinus during the latter part of June, making it difficult for observations in the northern hemisphere.



Comet Pons-Winnecke path through Capricornus, Aquarius and Piscis Austrimus, June (comet position shown 1st June). Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

Meteors

There are no major meteor events in June, though being out under clear skies, there is always the chance of observing a sporadic meteor or two during the night. The next shower to be on looking out for are the Southern Delta Aquariids in late July/early August.

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 form 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.

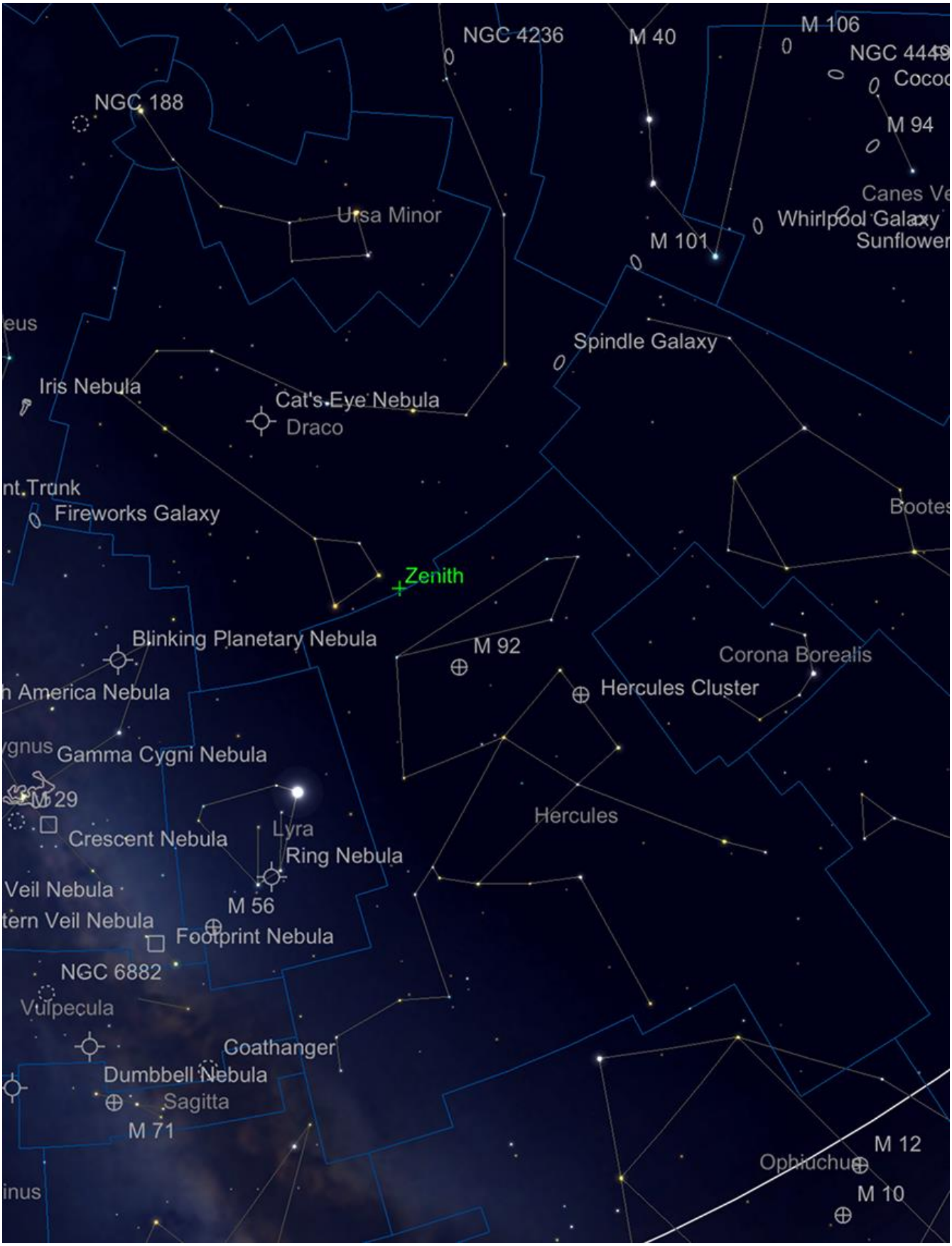
Whatever their origins, now is the best time to see NLCs from Northern latitudes. Interestingly, whilst Noctilucent Clouds have been observed in the Southern Hemisphere, their incidence appears much fewer than their Northern Hemispherical counterparts.

A spectacular NLC display captured by Bresser's Anke Morbitzer. Check out Anke's other pictures of the sky and atmospherics at http://astroyuki.com. Image used with kind permission.

Click here for Anke's timelapse video of an LNC display from 2020

Deep Sky Delights in Draco and Hercules

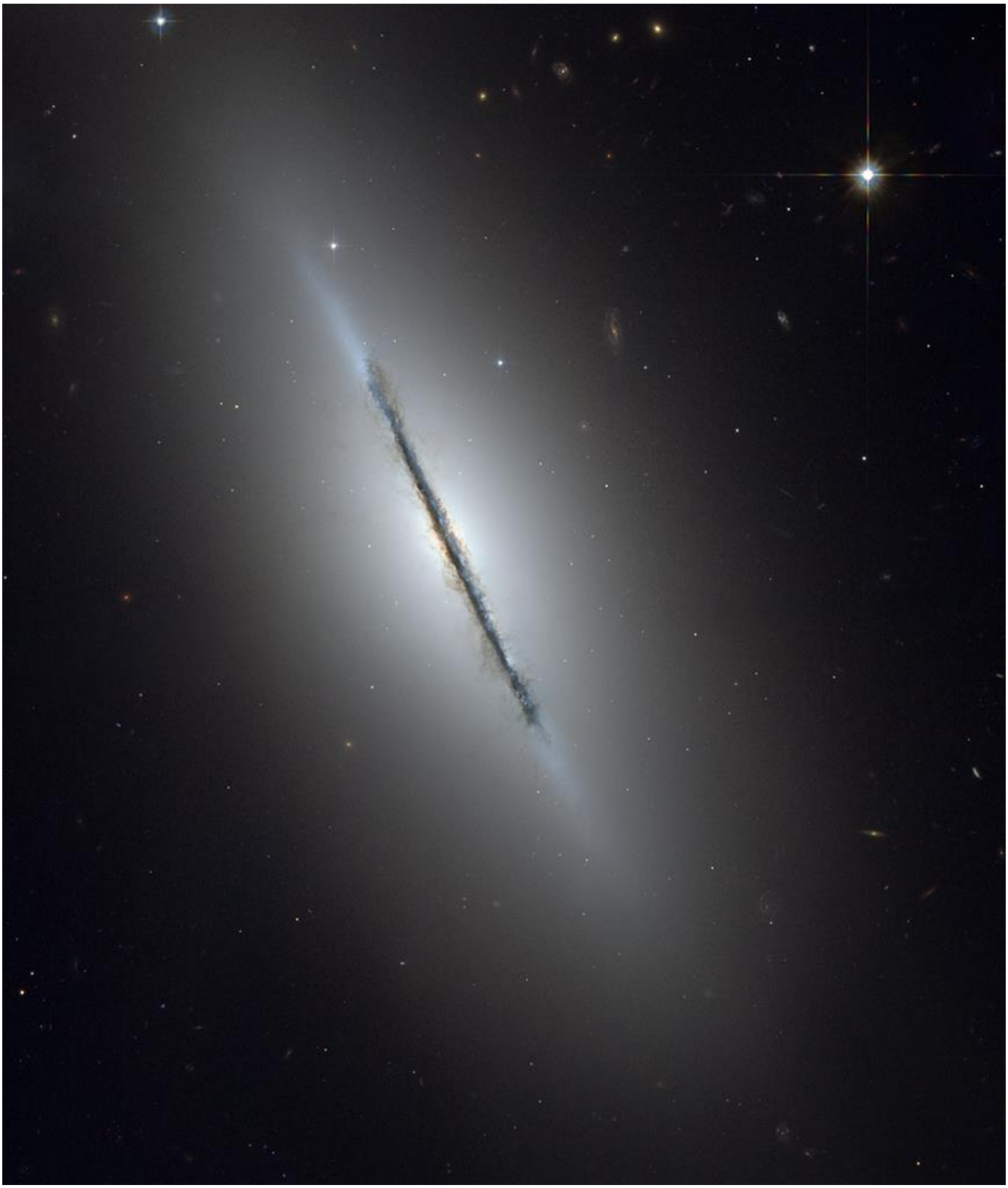
June is not the best time for observing really challenging Deep Sky objects from the Upper Northern Hemisphere, due to the Summer Solstice and the lack of true astronomical darkness, but there's still plenty to see, even if the sky is not at its darkest. Those readers in the Southern Hemisphere will 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 5 for Mac OS X, ©2010-2016 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 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 NGC9891 in Andromeda and NGC4565 in Coma Berenices.



M102 - Hubble Space Telescope Image (NASA/ESA). Public Domain.

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.

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.

NGC6543, The Cat's Eye Nebula - Hubble Space Telescope Image (NASA/ESA). 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.

M92 by Mark Blundell. Image used with kind permission.

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.

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 - Sloan Digital Sky Survey Image. Creative Commons.

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.

M13 by Mark Blundell. Image used with kind permission.

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

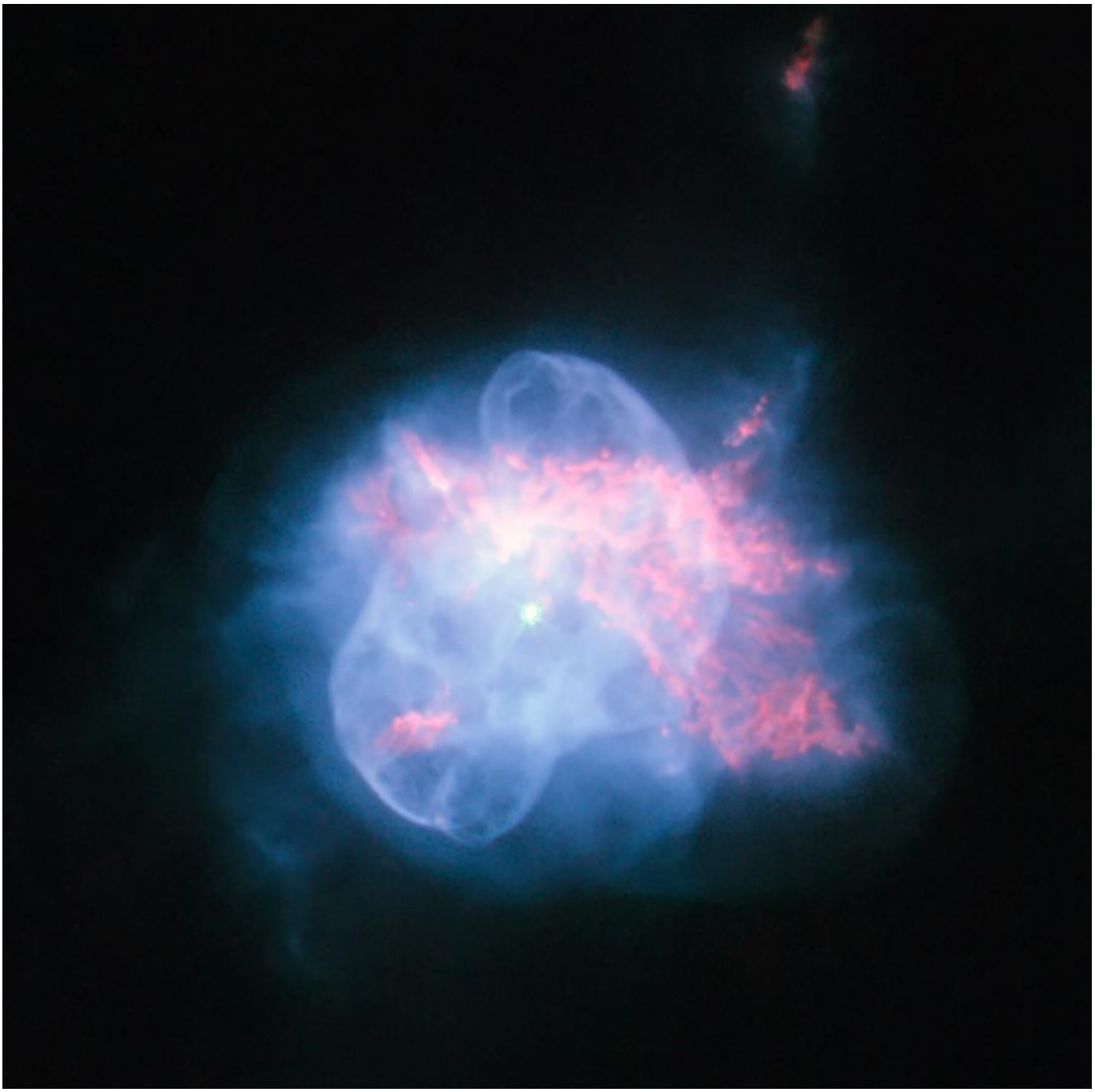
planet does, which would have required different biological strategies and processes to that which fuels a large amount of complex life on Earth. These potential inhabitants of M13 would have an amazing night time sky though, as the heavens would be littered with hundreds (if not thousands) of stars 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.

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

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?

Original text: Kerin Smith