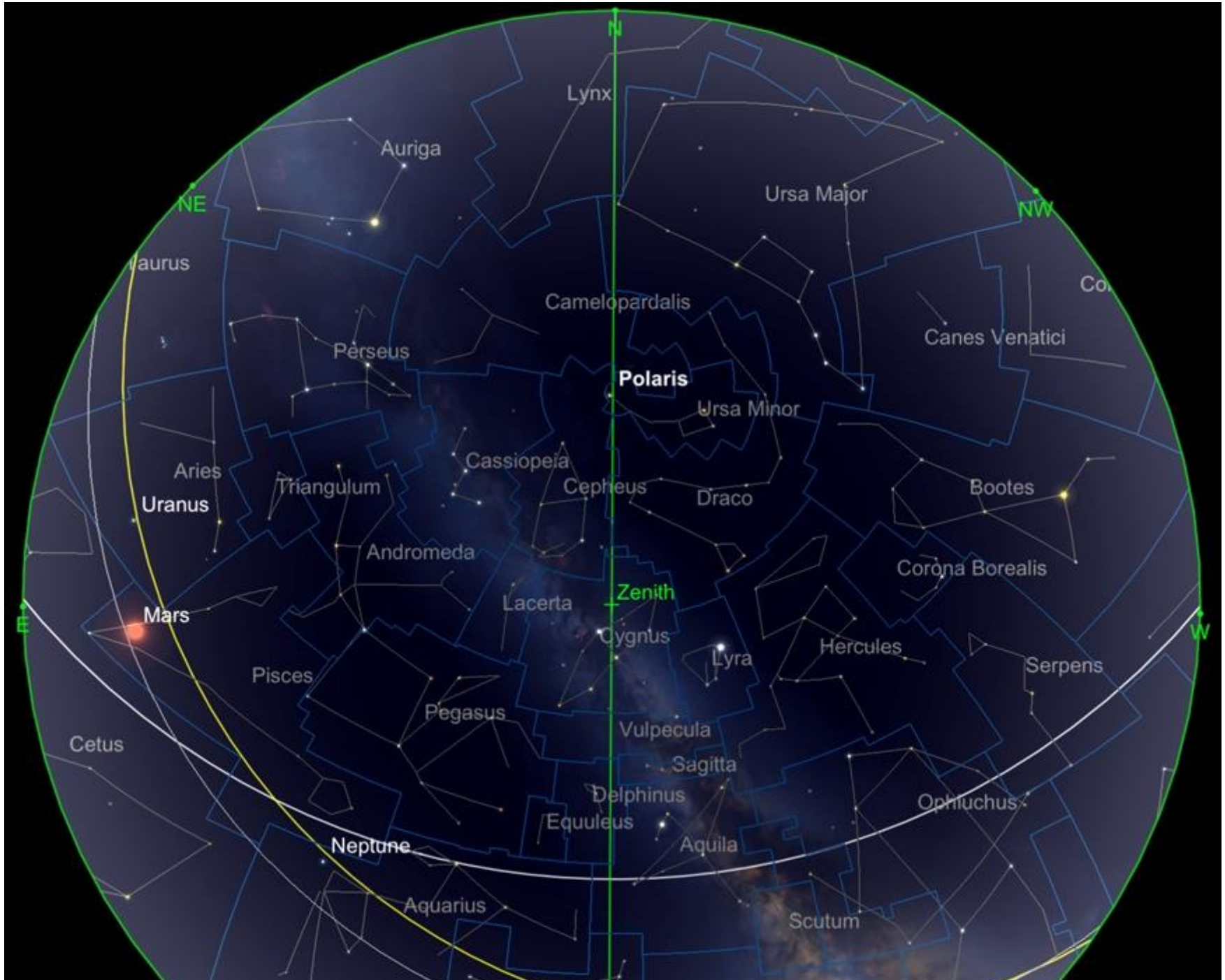

N
Lynx
Auriga
NE
Ursa Major
NW
Taurus
Camelopardalis
Canes Venatici
Perseus
Polaris
Ursa Minor
Cassiopeia
Aries
Triangulum
Cepheus
Draco
Bootes
Uranus
Andromeda
Corona Borealis
Zenith
Lacerta
E
Mars
Cygnus
W
Hercules
Lyra
Serpens
Pisces
Pegasus
Vulpecula
Cetus
Sagitta
Delphinus
Ophiuchus
Equuleus
Neptune
Aquila
Aquarius
Scutum

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

September brings the Autumnal Equinox for the Northern Hemisphere and the Vernal, or Spring Equinox for this in the Southern Hemisphere. This year these events occur on 22nd of September, where for a brief period for day and night are of nearly equal length. This equality of dark and light really depends on where you find yourself, as there are few places on Earth on the 22nd September where day and night are *truly* equal. However, crucially, the 22nd marks the point where the Sun crosses into the southern celestial hemisphere - which results in increasingly greater hours of darkness than light for those of us in the Northern Hemisphere; and of course increasingly less darkness for those in the Southern reaches of our planet, who conurrently experience their Vernal (Spring) Equinox. Many people for whom astronomy is of no more than at most a passing interest will bemoan the lack of daylight in the Northern Hemisphere - the same cannot (in all probability) be said of the many readers of this Sky Guide. For us astronomers, the dive towards Winter does have its perks.
As ever, there's a lot to see in skies above us this month...

The Solar System

The Moon

The beginning of The Moon begins September on the Capricorn/Aquarius borders as a Waxing Gibbous of just over 99% illumination. Reaching Full, the following morning on the 2nd, this naturally isn't the greatest part of the month for Deep Sky observing or imaging (without heavy filtration). On the evening of the 3rd, the Moon can be found 4 2/3rds degrees south of Neptune in the eastern part of Aquarius, though the much brighter moon will make observation of the much fainter planet tricky. The next few days finds the Moon rising through Cetus and Pisces, the highlight of which will be a close encounter with Mars in the morning skies over Europe, Africa and Western Asia. Mars will sit just under half a degree from the Moon's edge as the day begins. In major parts of Western Africa and South America, Mars will actually be occulted by the Moon, though it will only be possible to see this in the extreme south of Portugal and Spain from Europe.


Sep 06 12:20
Sep 06 11:20
Sep 06 10:20
Sep 06 09:20
Sep 06 08:20
Mars
29' 02.8" from Moon @ 5.2°
0.473 AU from Moon
Sep 06 07:20
Moon
Sep 06
Sep 06 05:20
Sep 06 04:20
Sep 06 03:20

The Moon and Mars, early morning, September 6th. *Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.*

The Moon reaches Last Quarter in the 10th while in Taurus.

The Moon then continues its coast up and over the most northerly part of the Ecliptic, until it dips down into reaches New on the Leo/Virgo borders on the 17th, passing to the north of the Sun, before emerging on the “evening” eastern side of our parent star.

The Moon reaches its visible Evening Crescent phase in a relatively low part of the Ecliptic from the northern hemisphere, drifting through the eastern parts of Virgo, into Libra until it comes to First Quarter in Sagittarius on 24th September. Before ending the month just prior to Full, the Moon joins Jupiter and Saturn in Sagittarius for close encounter on the 25th September. On the 30th the Moon is found back on the Aquarius/Cetus borders.

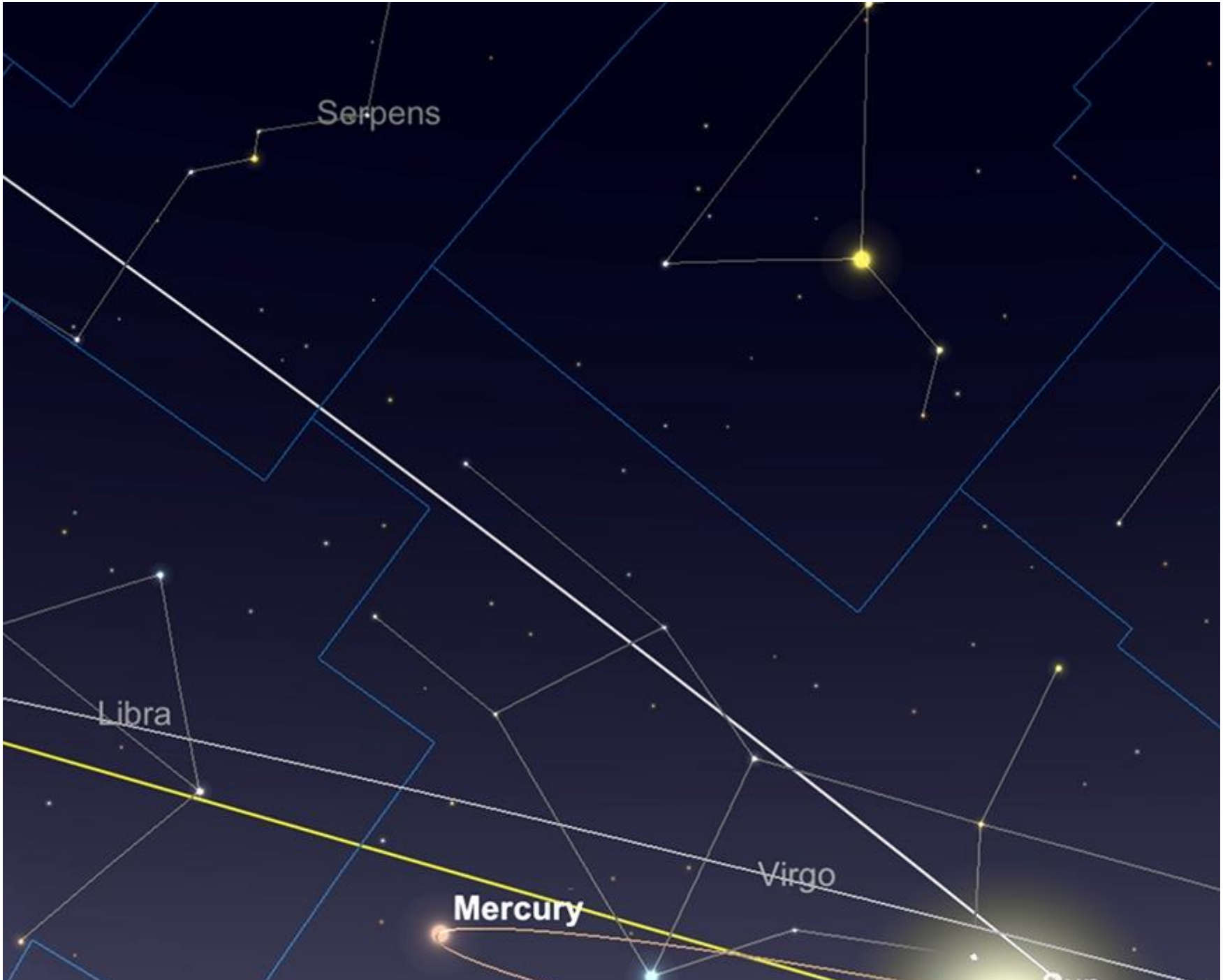
Mercury

The Innermost Planet starts the month as a -0.6 mag, 5 arc second diameter, 91.6% illuminated target, standing just under 4 degrees high in the west at sunset (from 51 degrees N). Mercury is drawing round the Sun towards from us, increasing its separation from the Sun as it does.

By the beginning of the second week of September, Mercury will have decreased its brightness to -0.3 magnitude and is 5.2 arc seconds across. But by this point, the planet has increased its separation from the Sun and will stand just over 4 degrees high at sunset.

Mid-September finds Mercury at -0.1 mag, still increasing its separation from the Sun. At sunset of the 15th, the planet will still sit at just over 4 degrees high (from 51 degrees N) - although solar separation has increased, as the Sun and Mercury are sitting around the celestial equator, for those of us higher latitudes, Mercury will still remain stubbornly low, the two bodies setting horizontally almost in line with each other. Those located in the equatorial regions of the Earth will fair increasing better, as Mercury and the Sun’s angle of separation will appear much more towards the vertical.

By the end of the month, Mercury is just a day shy of maximum eastern elongation - furthest point from the Sun as seen from Earth. By this point, the planet is +0.1 mag and 6.7 arc seconds across. Showing a 61.6% phase, Mercury will sit a disappointing 3 2/3 degrees high (from 51 degrees N).

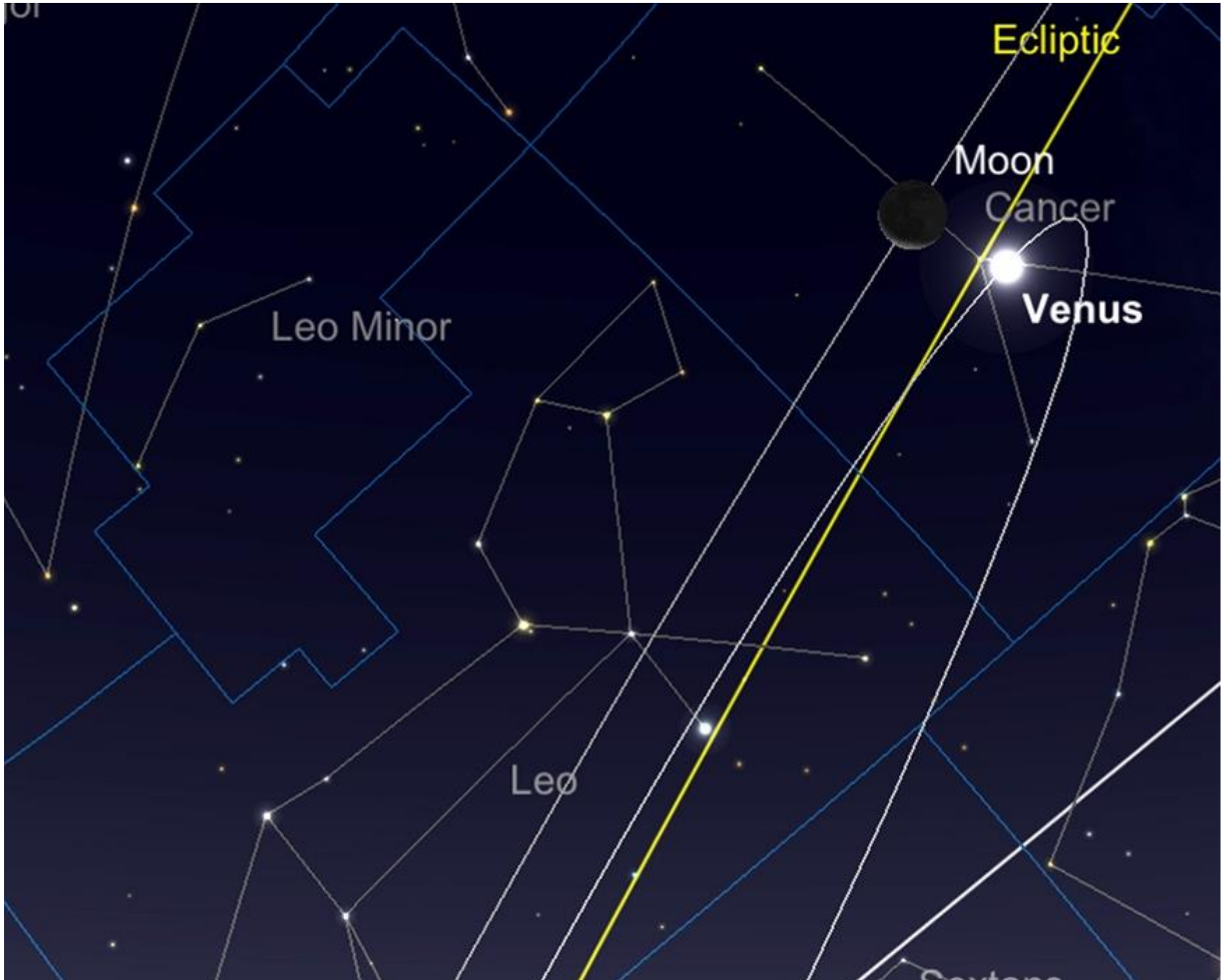

Serpens
Libra
Virgo
Mercury

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

Venus

The brilliant Venus starts September as a relatively well-placed object for observations in the morning sky, sitting in Gemini at -4.2 magnitude at a 60% illuminated gibbous phase, separated from the Sun by just under 45 degrees. Venus is over the lower-than-optimal 30 degree elevation mark (35 degrees high, from 51 degrees N) at sunrise on the 1st, meaning it will be above the majority of the increasing poor seeing that disrupts both telescopic observation and imaging, the lower an object is in the sky.

Venus is now decreasing its separation from the Sun currently, so mid-month finds the planet just under 43 degrees from the Sun, having faded fractionally to -4.1 mag and increased its phase to just under 66%. The preceding morning of the 14th, finds Venus forming a very attractive pairing with the very slim Waning Crescent Moon, with the planet sitting just under 4 degrees below the Moon as the day begins.


Ecliptic
Moon
Cancer
Venus
Leo Minor
Leo

Venus and the Crescent Moon, Sunrise, 14th September. *Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.*

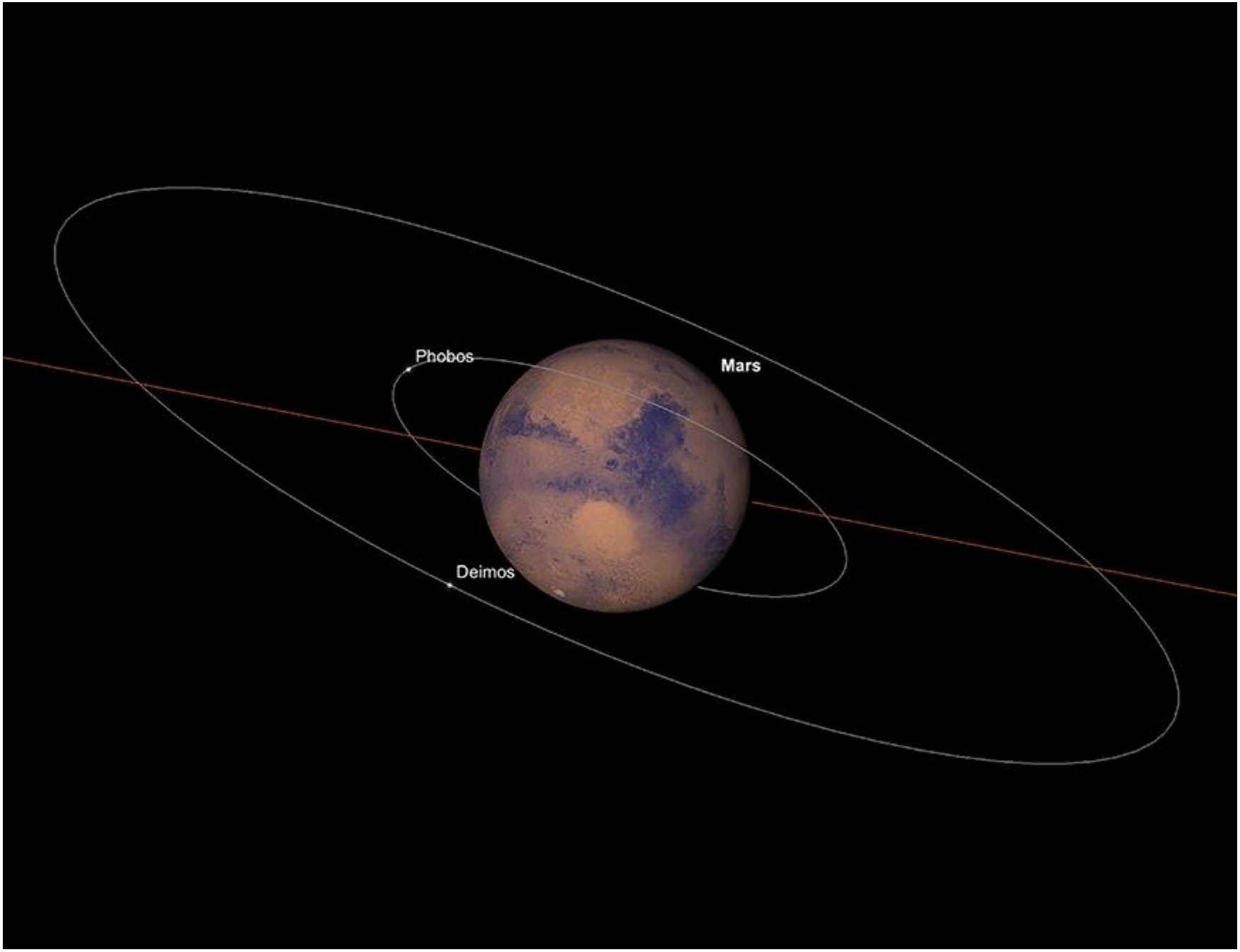
By the time we reach the latter stages of September, Venus has increased in phase to 71.3%, though is no brighter at -4.1 magnitude, sitting over 35 degrees high in the east as the sun rises (again, from 51 degrees N). By this point, Venus is just under 20 arc seconds angular diameter. Sitting in Leo as Venus now does, it is well past the most northerly part of the Ecliptic and while it will continue to put on a good show for the immediate future, by October's end the planet will be in the southern celestial hemisphere and will noticeably sink in the sky from a temperate northern hemisphere perspective.

Mars

At -1.8 mag and 18.9 arc seconds diameter at the month's beginning, Mars continues to brighten up and while there's a little while to go before mid-October's Opposition, the Red Planet is approaching its best and is a really worthwhile target for observation in telescopes of all sizes. Mars rises in Pisces, at a little before 10pm on the 1st, standing 46 degrees high in the south (from 51 degrees N)as it transits at just past 4am the following morning.

By mid-month, Mars has increased its magnitude to -2.2 and its angular size to 20.9 arc seconds diameter. The planet rises at 8.45pm, becoming notable in the east before midnight, where it will be clearly the brightest object in this quadrant of the sky (bar the odd lunar visit to Pisces).

At the month's end, Mars will rise at 9.43pm (BST) and will have reached an almost peak magnitude of -2.5 and now sits at 22.4 arc seconds diameter - besting Venus in size, though still not quite in the same league as Jupiter appears on average. By the end of September, we are a matter of two weeks before Mars hits Opposition - and peak brightness and size.


Phobos
Mars
Deimos

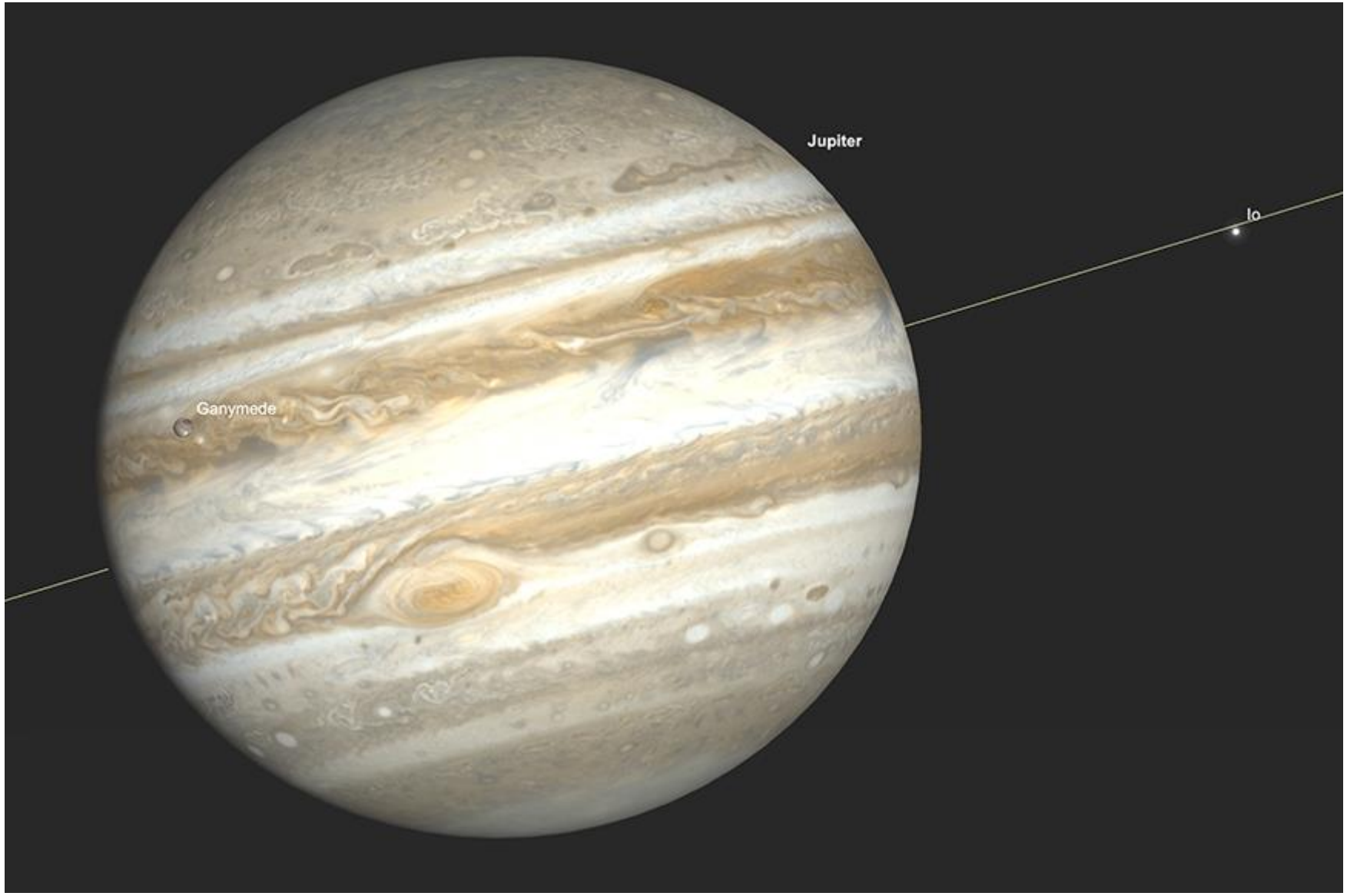
Mars, 1am (BST), 30th September. *Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.*

Jupiter

The giant planet Jupiter is very well-placed for evening observing, at -2.6 magnitude at the month's beginning, reaching Transit point at just before 10pm. Jupiter is rarely poor in a telescope, but a little caution must be advised for those of us in the northern hemisphere, as the planet is low in the south of the ecliptic and subject to much more in the way of potential atmospheric disturbance. Keeping magnification sensible will help combat poor seeing conditions to a certain extent. It's pointless making any planetary target bigger and consequently appear lower in brightness and contrast detail (this advice does also apply to Mars at this point, but the Red Planet is *much* higher in the sky than Jupiter). The 80A Light Blue Filter is regularly recommended for Jovian observations. While it can't help with atmospheric seeing, it can help isolate cloud belt detail and is useful in observing and isolate transits and shadow transits. Heavier filters, such as the No. 29 Dark Red filter can help in larger telescopes, though this does add a significant red caste to the appearance of a planet. Those looking for a slightly sharper view, without filtration are encouraged to try the more sophisticated Atmospheric Dispersion Corrector, as this can help defeat the effects of the spectral spread caused by atmospheric lensing and also really helps those attempting colour imaging. At just over 44 arc seconds across at the beginning of September, Jupiter presents a large, prominent target.

Jupiter rises at a little before 6pm (BST) on the 1st. Post-Opposition planets rise earlier and earlier as time progresses and by the end of the month, Jupiter will rise at just before four in the late afternoon and transits at a little before 8pm. By this point the planet will be fractionally dimmer at -2.4 mag and still an impressive 40.6 arc seconds in diameter.

In terms of Jovian events, visible from Europe, there's a nice dual Great Red Spot and Io Transit/Shadow Transit on the evening of 1st September that's visible from Europe. This is followed by a dual Europa Transit/Shadow Transit and GRS transit starting on the evening of the 4th. On the early evening of the 11th there's a GRS and Europa transit. There's a dual GRS and Callisto Transit on the 13th in the latter part of the evening. On the early evening of the 17th there's a brief GRS and Io transit. This is followed by a Ganymede and GRS transit in the early evening of the 19th and a brief GRS and Io transit again on the 26th. The end of the month brings us a dual GRS and Europa transit on the 29th, again in the early evening.

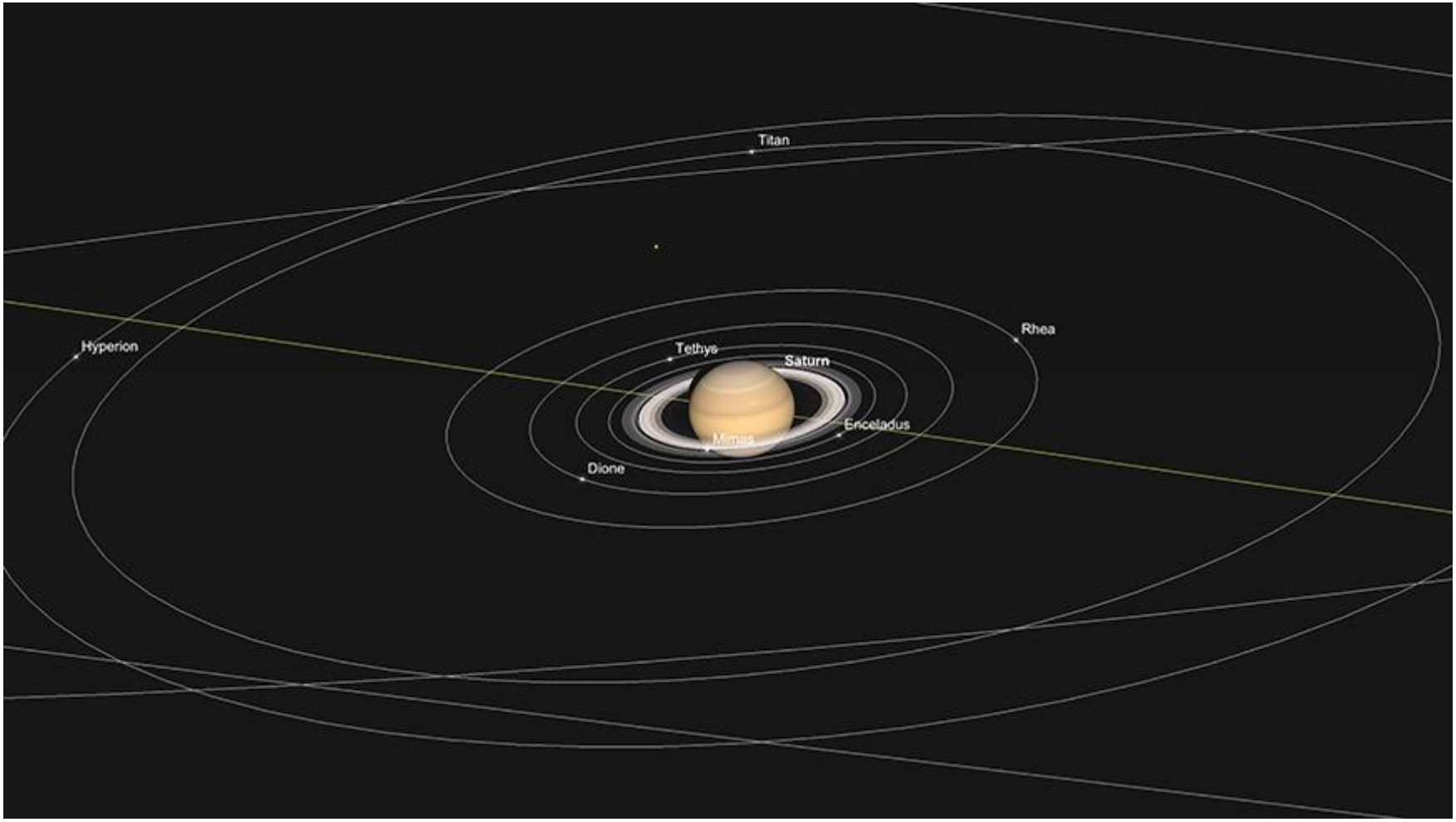

Jupiter
Io
Ganymede

Jupiter, dual GRS and Ganymede transit, early evening, 19th September. *Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.*

Saturn

Just like Jupiter, Saturn is very well seen in the evening at present. Again, like Jupiter, it's rather low for observers in the temperate northern hemisphere, but is always worth seeking out, no matter where in the world you find yourself. At the beginning of the month, Saturn is 18 arc seconds diameter) and +0.3 mag and presents a glorious view in any telescope, with its rings, while now past their point of maximum opening, still very well presented.

Saturn rises at juts past 6pm (BST) on the 1st, reaching transit point at just past 10pm. By the month's end the planet rises at a little after 4pm and transits at a little before 8.30pm (again, BST).



Satun and major moons, 1st September. *Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.*

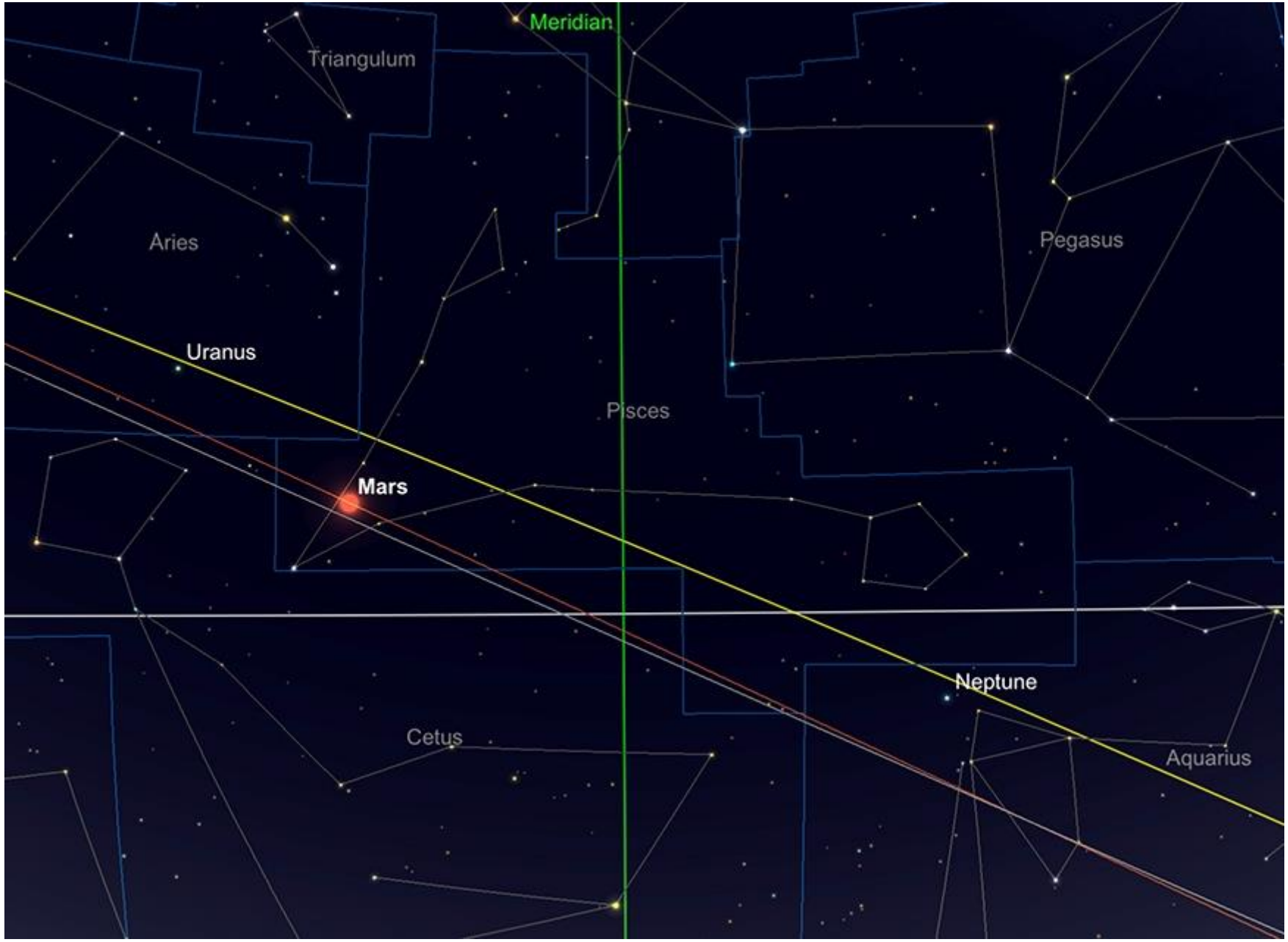
Saturn tends to appear slightly less affected by atmospherics that Jupiter, but this is more of a perceptual difference - Jupiter being that much brighter, disturbances are easier to see. If you have a telescope, you're encouraged to investigate this phenomenon, as Saturn and Jupiter are at much the same altitude during the evenings in September. You will always be able to see Titan, Saturn's largest moon in pretty much any telescope (even in larger Binoculars, under reasonable conditions), but Saturn's other major moons: Rhea, Dione, Tethys, Enceladus and Mimas will require larger instruments to see with any certainty.

Uranus and Neptune

The outer planets are visible throughout most of the night, but Neptune, coming to Opposition on the 11th is our main focus this month. Come this part of the month, Neptune will transit at a little after 1am (BST), naming attained a brightness of +7.8 and an angular diameter of 2.4 arc seconds.

Neptune was the first planet discovered thanks to mathematical prediction. While Galileo Galilei was the first human being to observe Neptune and record it in drawings, during 1612 and 1613, when it was very close to Jupiter, he recorded it as a background star. Neptune's true discovery had to wait for the discovery of Uranus by Sir William Herschel in 1781. Subsequent observations of Uranus' orbit suggested that something large was potentially lurking out in a more distant orbit. English Astronomer John Couch Adams and the French Mathematician Urbain Le Verrier independently performed calculations predicting the possible position of an outer planet. Neither received a tremendous response from active observational astronomers in their home countries, until it was too late. The British Astronomical establishment realised soon after Le Verrier delivered a lecture in Paris on the issue, how close both his and Adam's predictions were and while observations were hastily convened, out of date star maps and communication issues led to Neptune twice being observed and missed as a potential target. While this was occurring, Le Verrier presented his more detailed predictions of location to Astronomers at the Berlin Observatory and Johann Galle and his assistant Henrich d'Arrest found the planet using the main observatory's 24cm Merz Fraunhofer Doublet refractor within the first hour of their search - within a degree of Le Verrier's prediction - on the 24th September 1846.

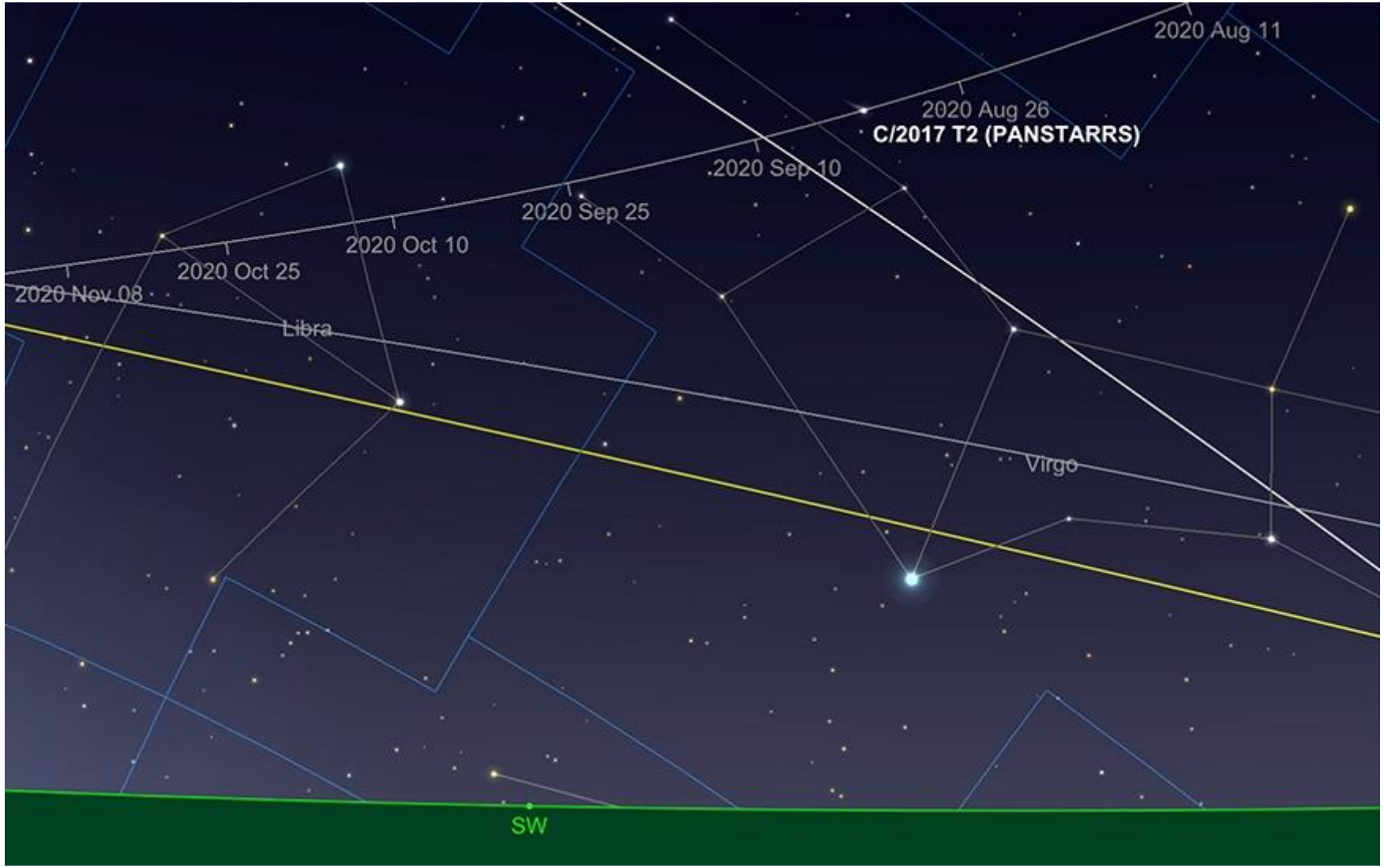
The brighter Uranus rises in Aries a little before midnight on the 1st, but does not transit until the small hours of the morning. Uranus is significantly brighter that Neptune, at +5.7 magnitude and 3.7 arc seconds across. While technically the planet is a naked eye object under exceptional conditions, most of us will need binoculars or preferably a telescope to make a positive identification.


Meridian
Triangulum
Aries
Pegasus
Uranus
Pisces
Mars
Neptune
Cetus
Aquarius

Uranus and Neptune relative sky positions, September 2020. *Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.*

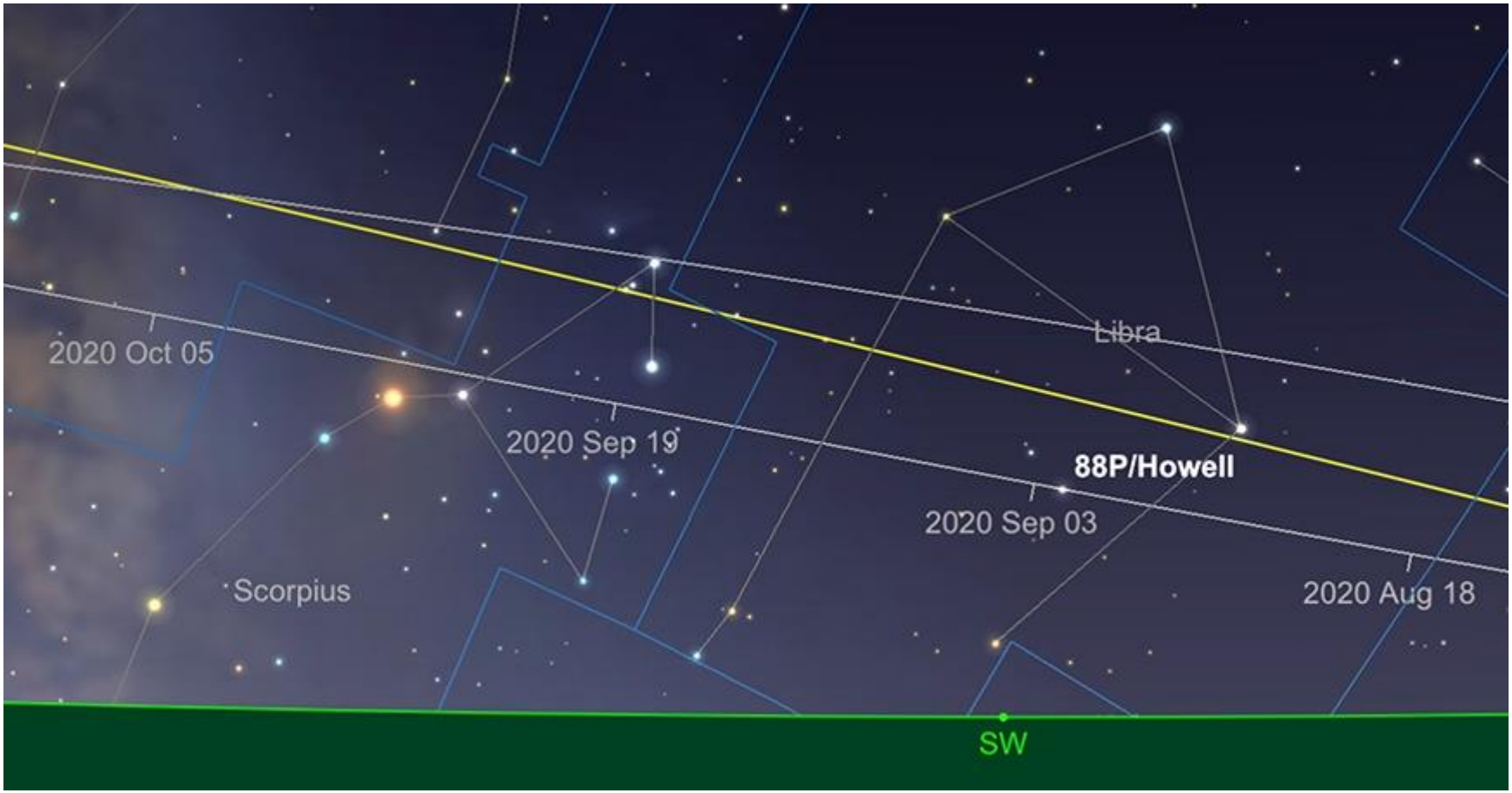
Comets

C/2017 T2 PanSTARRS remains an interesting evening comet, though is now fading. The comet begins the month in Virgo, dropping in a south easterly trajectory during the month, into Libra at the end of the month. At +10.7 mag at the month's beginning, this is definitely a comet for telescopic or high power binocular observation.



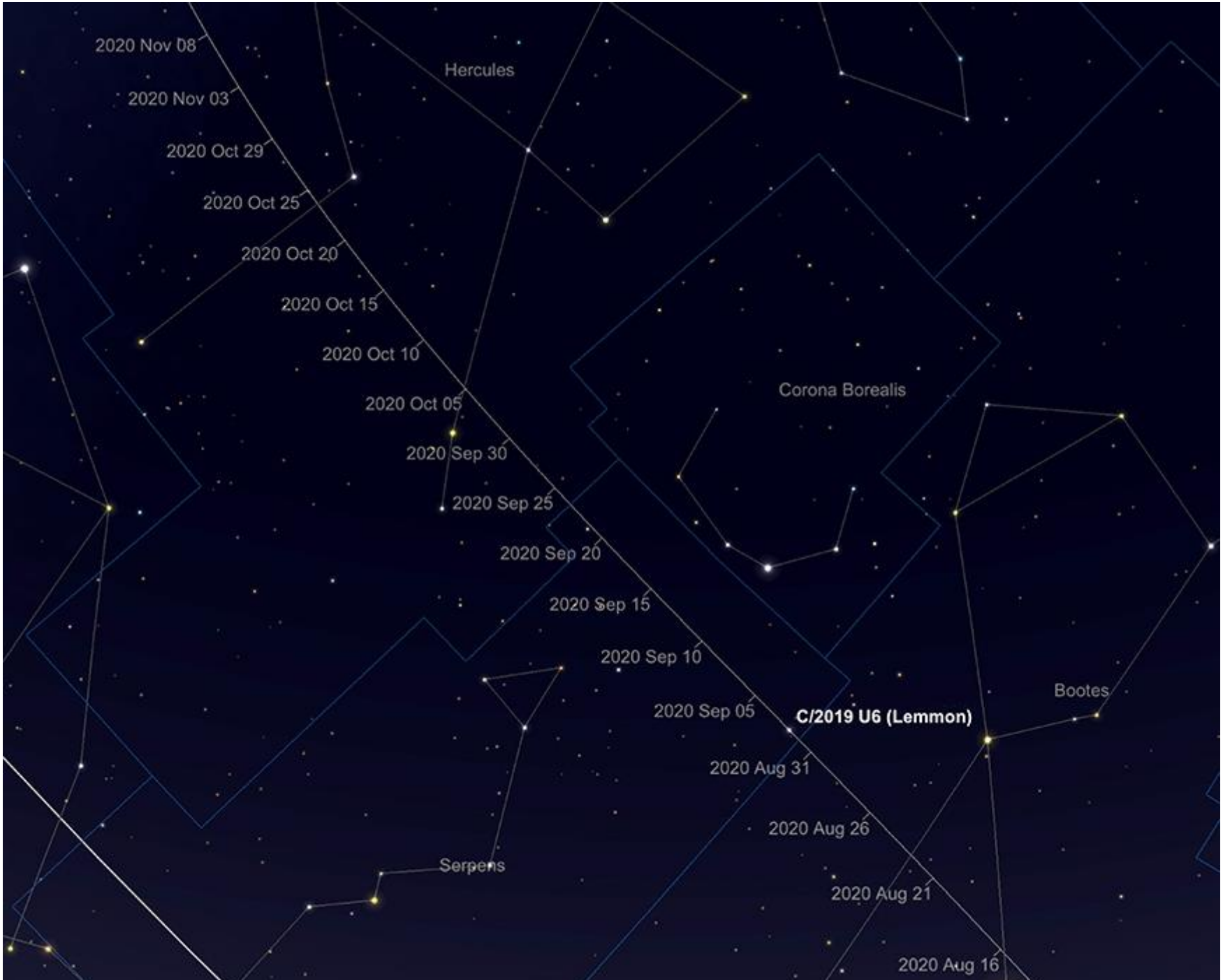
C/2017 T2 PanSTARRS path, September 2020 (comet position shown 1st Sept). Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

Periodic comet 88/P Howell will be tracking through Libra and Scorpius during September and will be worth checking out telescopically. It won't be very bright and will be best seen by those further awards the equatorial areas of the planet. It will skirt the horizons in the evenings for those of us in the temperate northern hemisphere, making it challenging to observe.



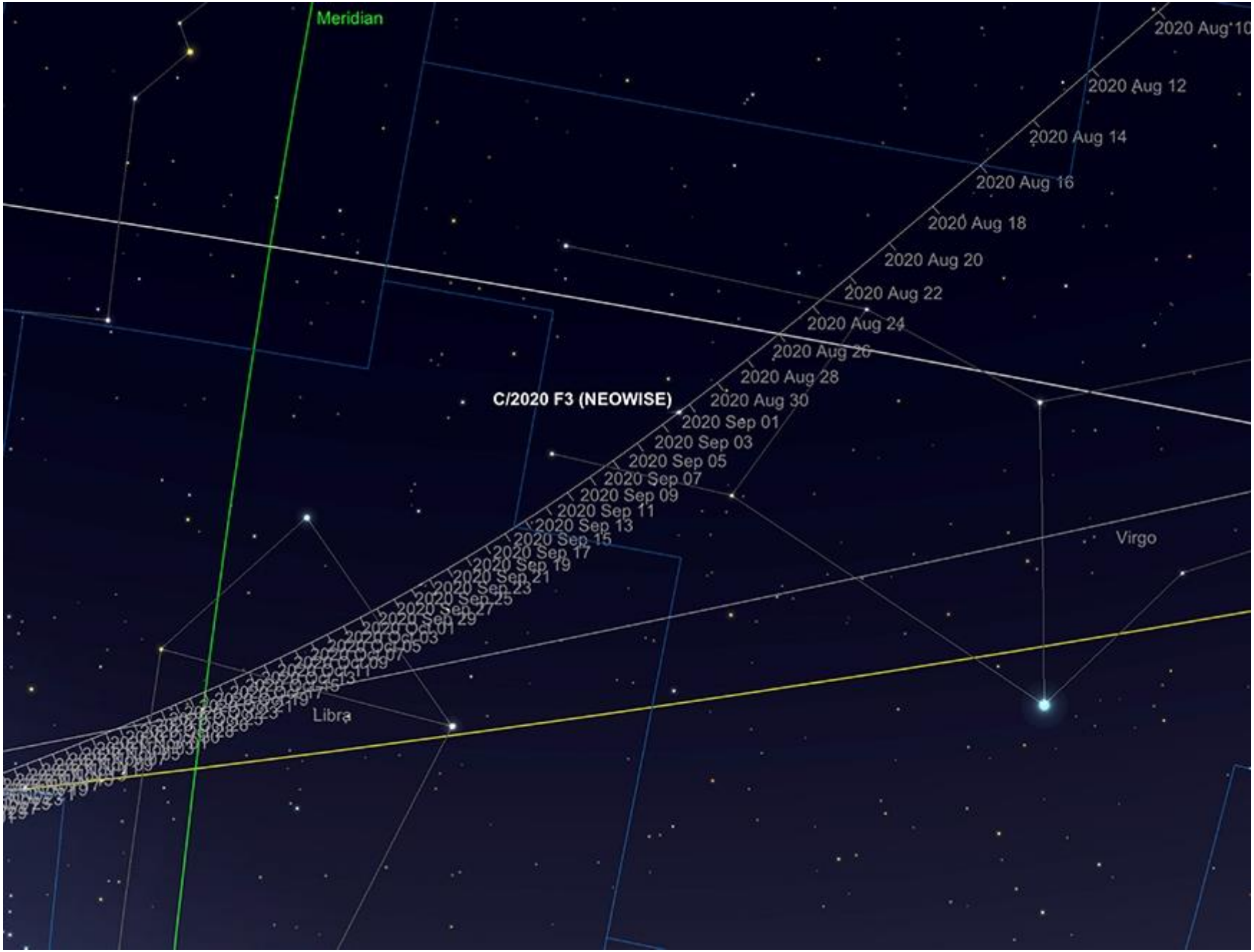
88/P Howell path, September 2020 (comet position shown 1st Sept). Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

C/2019 U6 LEMMON - this is another comet for those with larger binoculars or telescopes and is fading. Post-perihelion, from mid-July, the comet had climbed up into the northern celestial hemisphere. The comet has peaked at around 6th magnitude, though will fade considerably throughout September. It will climb through Serpens into Hercules as the month progresses.


2020 Nov 08
2020 Nov 03
2020 Oct 29
2020 Oct 25
2020 Oct 20
2020 Oct 15
2020 Oct 10
2020 Oct 05
2020 Sep 30
2020 Sep 25
2020 Sep 20
2020 Sep 15
2020 Sep 10
2020 Sep 05
2020 Aug 31
2020 Aug 26
2020 Aug 21
2020 Aug 16
Hercules
Corona Borealis
Bootes
Serpens
C/2019 U6 (Lemmon)

C/2019 U6 Lemmon path, September 2020. Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

Last but not least, C/2020 F3 NEOWISE - having peaked at around +0 magnitude, being the best comet seen for many years, the party is definitely over for this one. During the September it it will journey through the eastern reaches of Virgo into Libra and is now a shadow of its former self. Larger telescopes will still pick it up and while there's always a chance of outburst, it's unlikely to deliver any more of the amazing visual treats it did earlier in the year. By the end of the month it's likely to be around 11th/12th mag.


Meridian
2020 Aug 10
2020 Aug 12
2020 Aug 14
2020 Aug 16
2020 Aug 18
2020 Aug 20
2020 Aug 22
2020 Aug 24
2020 Aug 26
2020 Aug 28
2020 Aug 30
C/2020 F3 (NEOWISE)
2020 Sep 01
2020 Sep 03
2020 Sep 05
2020 Sep 07
2020 Sep 09
2020 Sep 11
2020 Sep 13
2020 Sep 15
2020 Sep 17
2020 Sep 19
2020 Sep 21
2020 Sep 23
2020 Sep 25
2020 Sep 27
2020 Sep 29
Virgo
Libra

C/2020 F3 NEOWISE path, September 2020. Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

While C/2020 F3 is fading, it has left an indelible impression on the astronomical and wider community worldwide. Neowise is argueably the most photographed comet of all time and certianly in the age of social media the most shared. We've been through a great - albeit brief - period where an astronomical event has definitely touched a wider audience and it's interesting to speculate when the next event of this type will occur? Here's a few pictures of Comet C/2020 F3 NEOWISE we've taken, or been sent...

Image Credit: Kerin Smith. Explore Scientific 127mm Triplet, Canon 600D, HEQ5 Pro.

Image Credit: Gary Palmer. Canon L 100-400 Lens, Canon 70d, Explore Scientific EXOS-2 mount.

Neowise by Phil Thompson. Explore Scientific ED APO 80 19x30s, ISO 400 Nikon D3500 , Sky Watcher Star Adventurer.

For detailed predictions of cometary locations, those interested are encouraged to check in to the BAA Comet Section on their website here: https://people.ast.cam.ac.uk/~jds/

Meteors

There are no major showers in September - though the Southern Taurids are active in the latter period of the month, from the 10th onwards. These produce no more than 5 meteors an hour, but can result in notable fireballs. The shower, along with its northern contemporaries, which peak in November, are thought to emanate from Encke's Comet, the regular short period body. If you do see a bright meteor during September, trace the trail and if it appears to come from the Taurus areas, there's a good chance that you've witnessed a Taurid. However, it should be pointed out that you're almost as likely to see a sporadic meteor during this period. This "shower" stretches the often disappointing term practically to breaking point!

Two other even more minor 'showers' reach their maxima during the month: the Aurigids (which peak on September 1st), and the September Epsilon Perseids (which peak on September 9th). These showers are very sparse, with Zenithal Hourly Rates of around 5 meteors per hour. The sometimes-mentioned Piscids (which peak on 21st September) are also supposedly active during this period, but opinions seem to differ as to whether or not this shower is truly active any longer. There are another couple of minor showers associated with Pisces - the Delta and Pi Piscids, which are active (if that's the right word) during June and July, but these have ZHRs of less than 2 meteors. Certainly not worth braving the wee small hours looking out for.
The positive identification of the source of a particular meteor can be tricky with minor showers, especially at this time of year when the Perseids are still reasonably active until late August (and occasionally beyond) and the next major shower to peak, the Orionids (more of which in next month's Sky Guide) run from late August to mid-November. Taking photos or sketching the direction of meteors is the only reliable way of estimating which shower they belong to. Tracing the direction of the meteor back to a radiant will allow an observer to make an educated assumption. Of course, there's always the possibility of catching a sporadic meteor, which can come from any direction at any moment.

Deep Sky Delights in Pegasus and Aquarius


Pisces
Pegasus
Equuleus

Pegasus and Aquarius. *Image created with SkySafari for Mac OS X, ©2010-2012 by Southern Stars, www.southernstars.com.*

Moving in a south-easterly direction from where we left last month's Deep Sky highlights at the "top" of the Summer Milky Way, we come to the constellations of Pegasus and Aquarius, which share a border and are home to some easy and not-so-easy to observe objects.
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.


NGC 7331 Galaxy
and Stephan's Quintet
Const: Pegasus
By Mark Blundell
2nd October 2015

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.

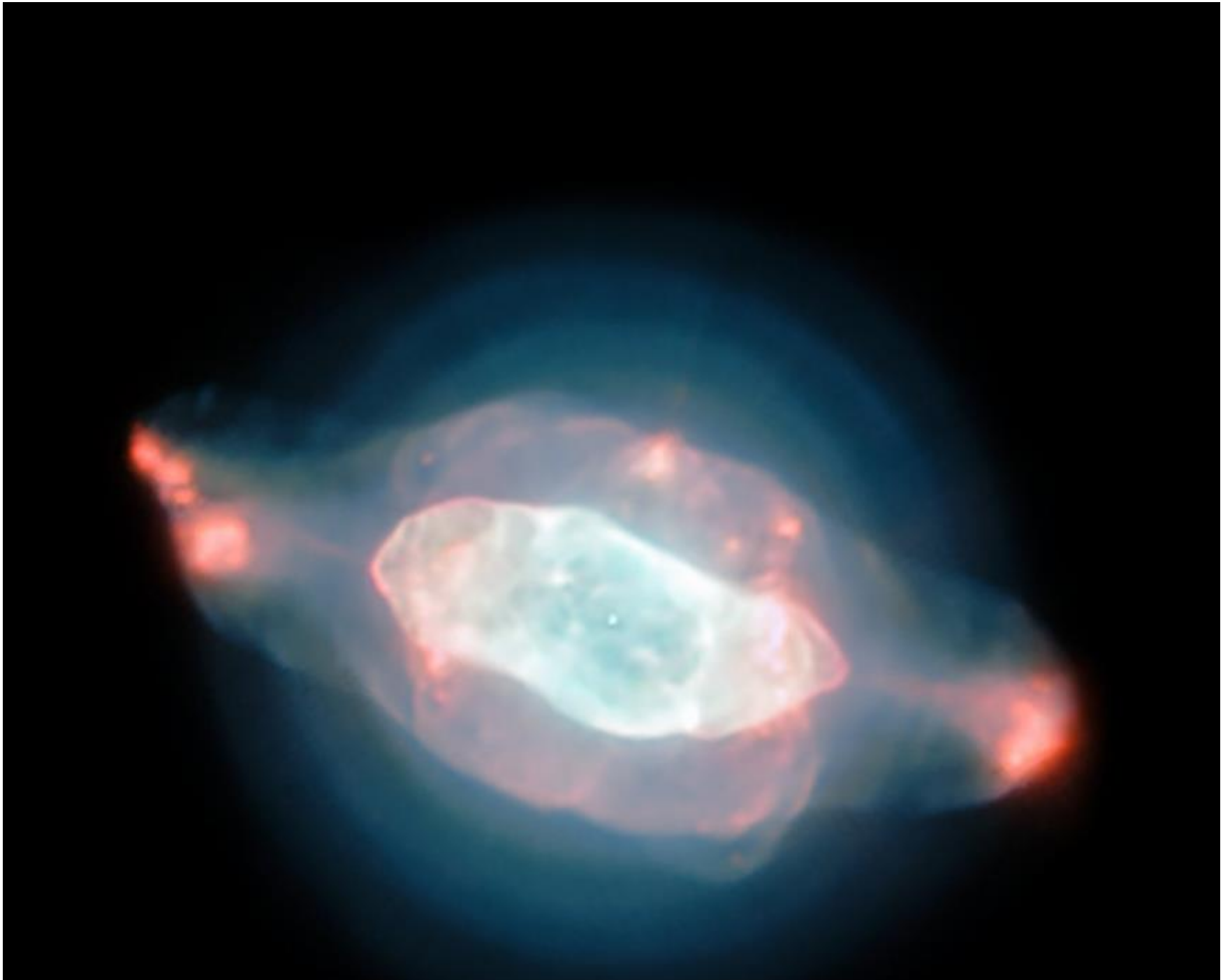
The interior of Stephan's Quintet, pictured by the Hubble Space Telescope. Image Credit: NASA/ESA, Public Domain.

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 di cult 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.

Text: Kerin Smith