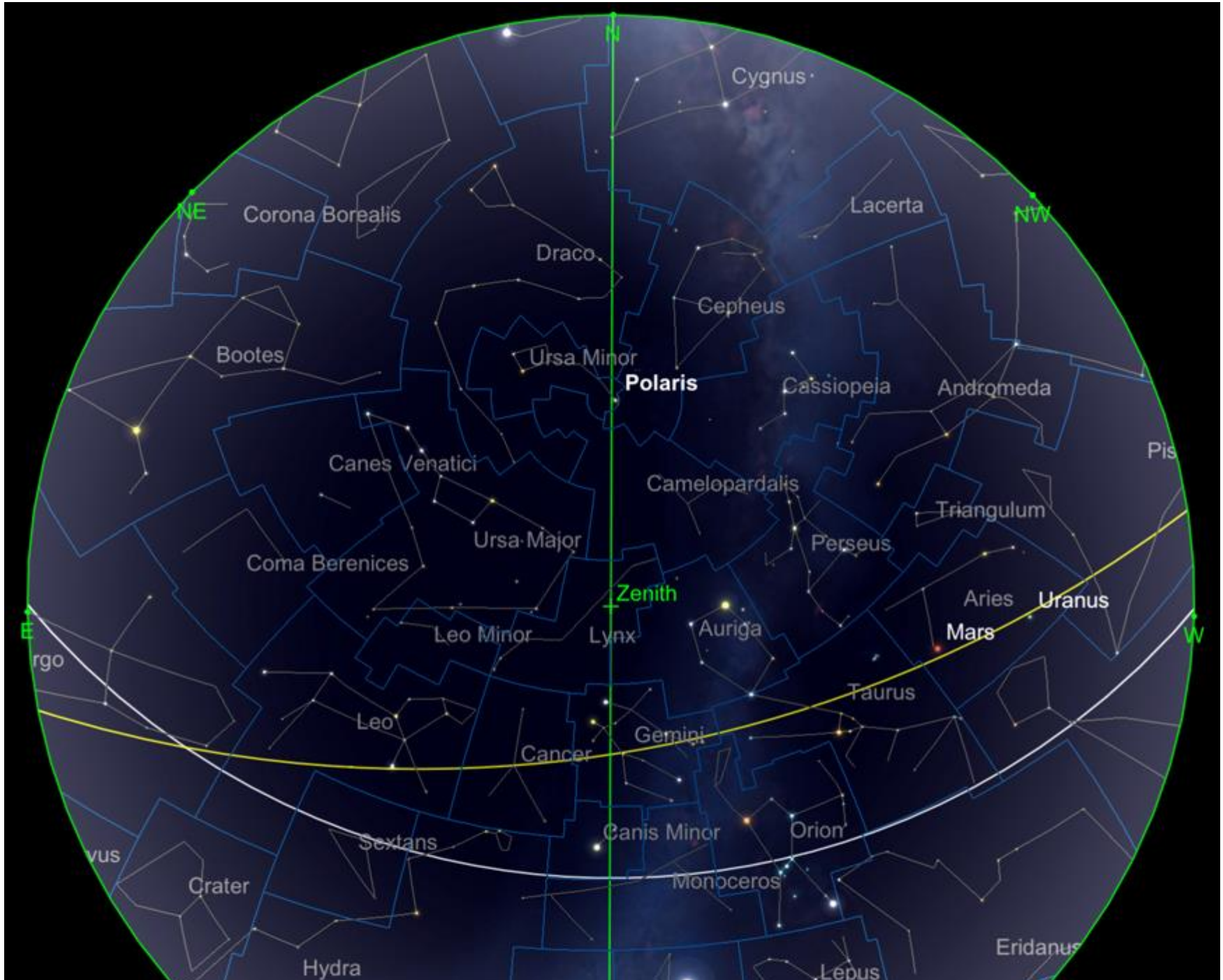

N
Cygnus
NE
Corona Borealis
Lacerta
NW
Draco
Cepheus
Bootes
Ursa Minor
Polaris
Cassiopeia
Andromeda
Canes Venatici
Camelopardalis
Triangulum
Ursa Major
Perseus
Coma Berenices
Zenith
Aries
Uranus
E
Leo Minor
Lynx
Auriga
Mars
W
Taurus
Leo
Gemini
Cancer
Canis Minor
Orion
Sextans
Crater
Monoceros
Eridanus
Hydra
Lepus

Telescope House February 2021 Sky Guide

It's February - the shortest month. This year is not a leap year, where an extra day - the 29th - is inserted to counteract the slightly difference between the Earth's rotation and our very human need to subdivide time.

While February is most definitely still Winter for those in the Northern Hemisphere, residents of this part of the world will definitely notice the increasing hours of daylight, making both mornings and evenings lighter. Of course, those in the Southern Hemisphere will be experiencing the exact opposite, with increasing hours of darkness - after their Midsummer in December.

Wherever you find yourself in the world, as ever, there's plenty to see in the skies above us this February.

The Solar System

The Moon

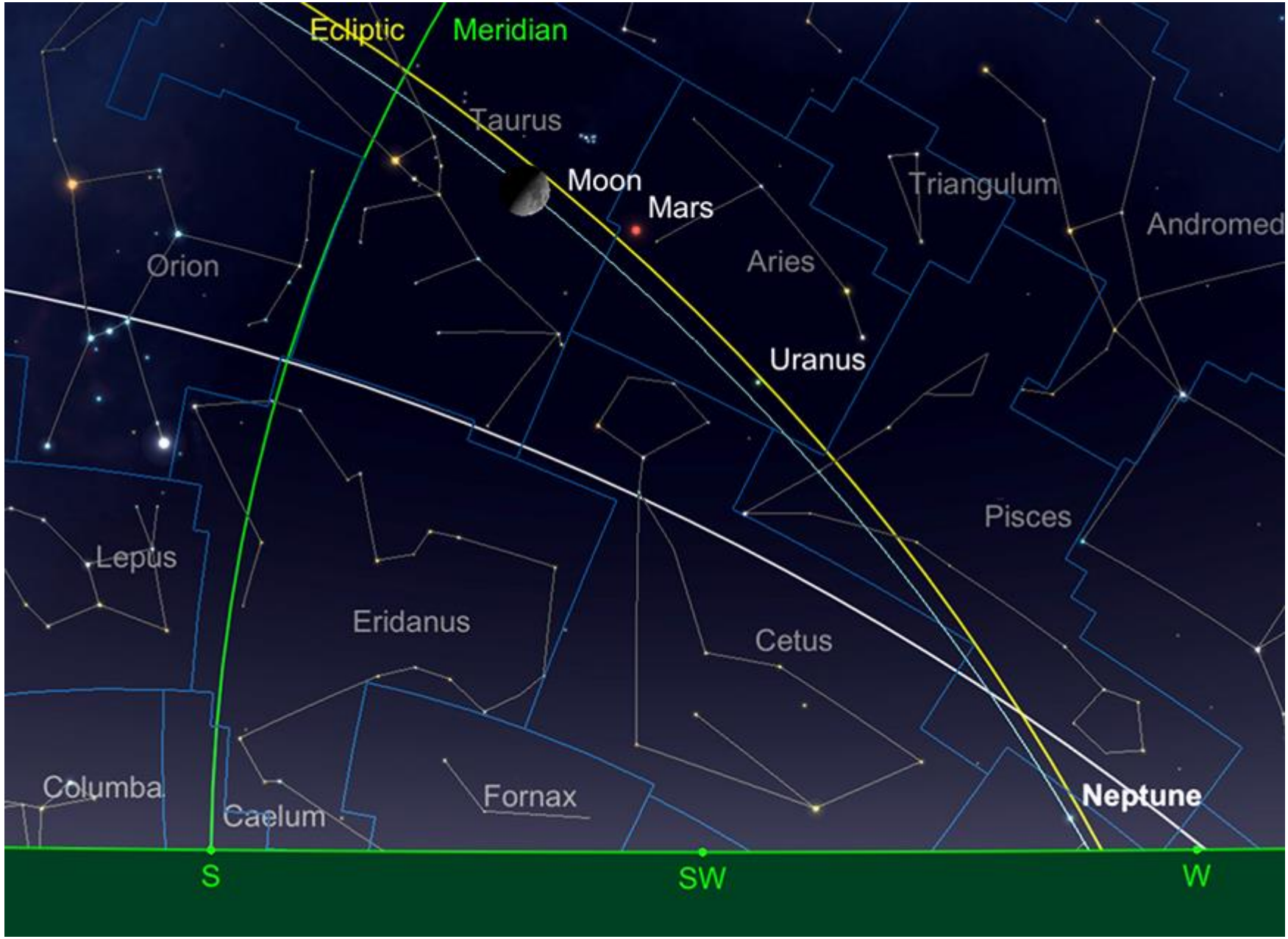
The Moon begins February at 80% Waning Gibbous phase in Virgo, rising just before 10pm (GMT). Naturally, the very first part of the month (and its end too) will not be the best time for observations of deep sky objects, or astrophotography (without recourse to narrowband filtration), beyond the latter part of the evening.

Last Quarter occurs on the 4th, with the Moon in Libra. Rising at just before 12.30am (GMT), there will be a significant part of the early part of the night unaffected by moonlight. This situation continues to improve as we the moon slides through the southern part of the Ecliptic to reach the Sun in the western part of Capricornus on the 11th.

For those of us in the northern hemisphere, we now enter into a phase of lunar evening apparitions known as the “High Spring Crescents”. Although February is emphatically not officially Spring in the northern hemisphere, the first of these apparitions occurs this month where the Moon comes to Half Phase in a very high part of the Ecliptic. The apparent angle of the path of the Ecliptic the Moon moves through in the evenings appears to get steeper as the year progresses and we in the temperate northern hemisphere gain the benefit of observing the Moon at a higher altitude from the horizon during its Evening Crescent phase. For those of us in this part of the world, the next few months present the best time to observe the Moon in the evening sky at Crescent phase, during which surface relief appears at its most extreme.

First Quarter is reached on the 19th, in Taurus, with the Moon just under 9 degrees to the west of the planet Mars in neighbouring Pisces.

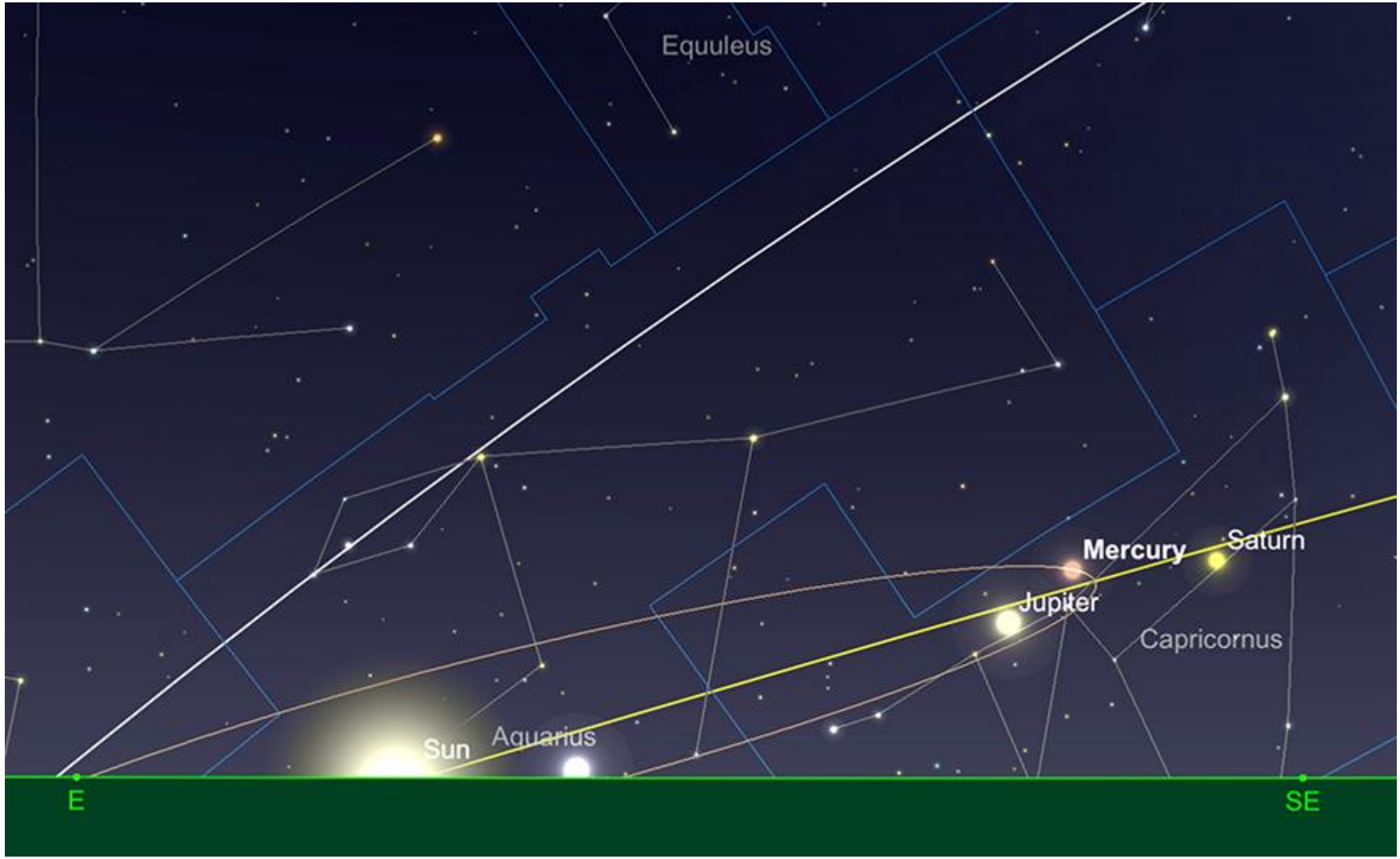
As previous reported, Full Moon occurs on the 27th in Leo and the Moon ends February a day later (still in Leo) at a 99% illuminated Waning Gibbous phase.


Ecliptic
Meridian
Taurus
Moon
Mars
Triangulum
Andromed
Orion
Aries
Uranus
Pisces
Lepus
Eridanus
Cetus
Columba
Caelum
Fornax
Neptune
S
SW
W

Mercury

The solar system's smallest planet starts the month as an evening object in Capricornus. Sitting just over 11 degrees high (from 51 degrees N), Mercury is a very difficult +1.4 magnitude in brightness on the 1st, presenting a just under 9 arc second diameter 15.5% illuminated disk. The planet is separated from the Sun by just over 13 degrees, which if the planet was not as relatively faint would make it easy to spot at the month's beginning. Sadly, as Mercury is heading towards us and down towards the Sun, as the first week of February progresses, its phases decreasing as it does, conditions for observations are not as kind as they have recently been in the latter part of January.

Mercury reaches Inferior Conjunction (the orbital position between the Earth and the Sun) on 8th February, after which it will become a morning object. The first week after conjunction is a write-off in terms of observations and its only really the latter part of the month when the planet increases its phase and thus brightness that it becomes a relatively straightforward target to find (as long as you have a decent easterly horizon). Jupiter, much brighter at -2.0 magnitude sits 3 degrees east of Mercury in a sunward direction can act as a signpost for Mercury's position in the dawn sky as the month ends. At +0.3 mag, Mercury is nowhere near as prominent, but will be possible to find loon the horizon - if the weather is kind.


Equuleus
Mercury
Saturn
Jupiter
Capricornus
Sun
Aquarius
E
SE

Venus

Venus is found on the Sagittarius/Capricornus border at the month's beginning. At 97.6% illuminated Gibbous Phase and -3.8 mag, the planet is its usual conspicuous self, much brighter than anything in the same area of sky (excepting the Sun itself). The planet is travelling sunward at pace and it will shortly reach Superior Conjunction in late March. Venus is in a rather shallow-rising area of sky at present, which means it only reaches 3 degrees high (from 51 degrees N) in altitude above the horizon as the Sun rises. As the month progresses, Venus draws closer and closer to the Sun, passing very close to Jupiter on the morning of the 11th, with the two planets separated just half a degree. While this isn't quite as close as Jupiter and Saturn's December 2020 "Great Conjunction", it will be pretty spectacular from the regions of Earth closer to the equator, though sadly difficult to see from northern temperate climes (unless you a have a very clear easterly horizon)

As February continues, Venus remains at the same brightness, as its increase in phase balances out its decrease in angular size. However, by the 15th, Venus stands just over 1 1/2 degrees high (again, from 51 degrees N) at sunrise. At the month's end, the planet will rise practically in line with the Sun from mid-northern latitudes - by which point it will sit just 6 1/2 degrees from the Sun.


us
Aquila
Celestial Equator
Pluto
Venus
Saturn

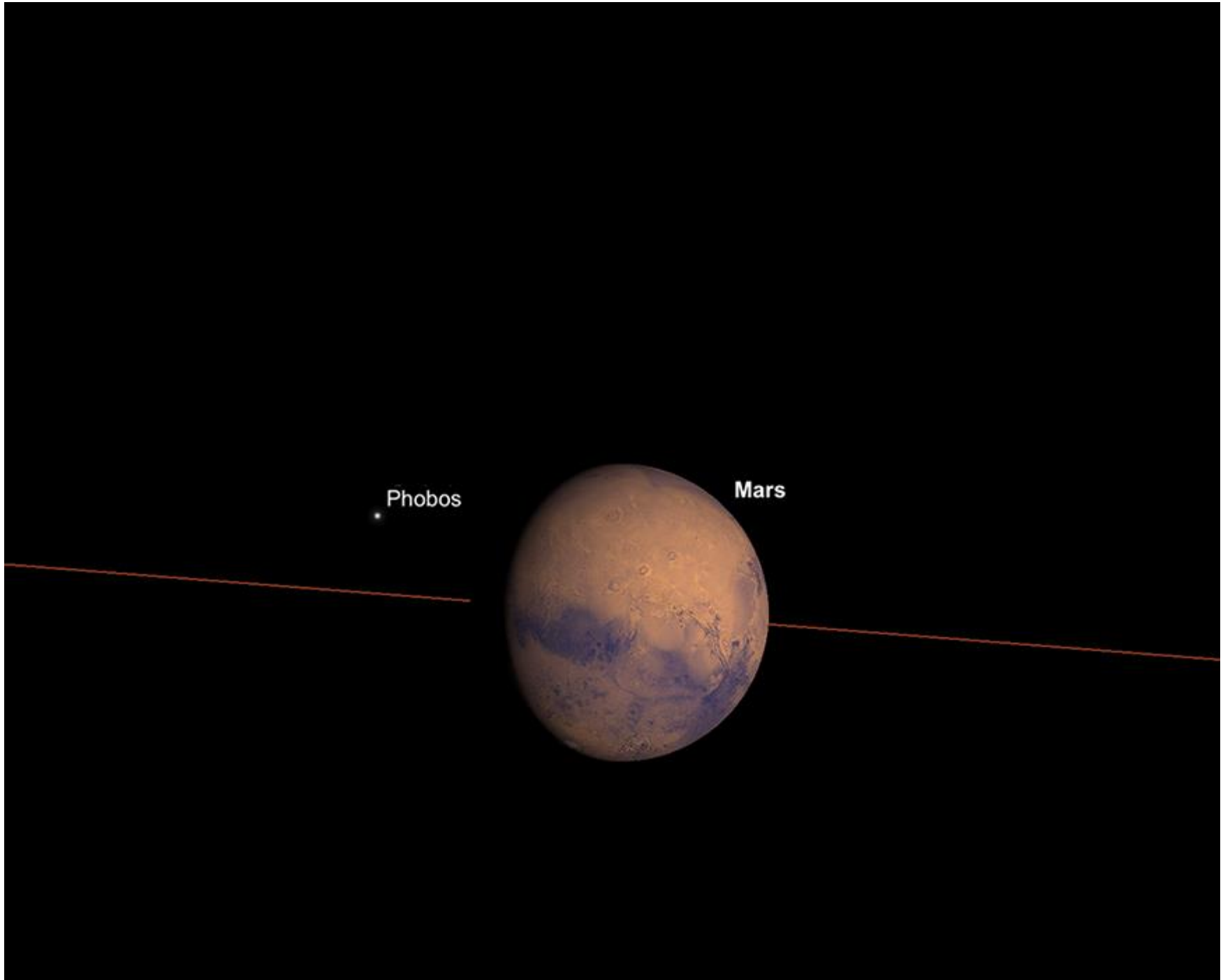
Mars

Mars is still well-placed for evening observations in Aries. Transiting at just after 6pm, Mars is 7.8 arc seconds across and is +0.5 magnitude on the 1st.

As Mars is a comparatively small planet in relation to the Earth, the planet's disk appears to shrink quite rapidly once we begin to pull away from it on our faster interior orbit. Subsequently, the earlier Mars is observed during the month, the more rewarding it will be.

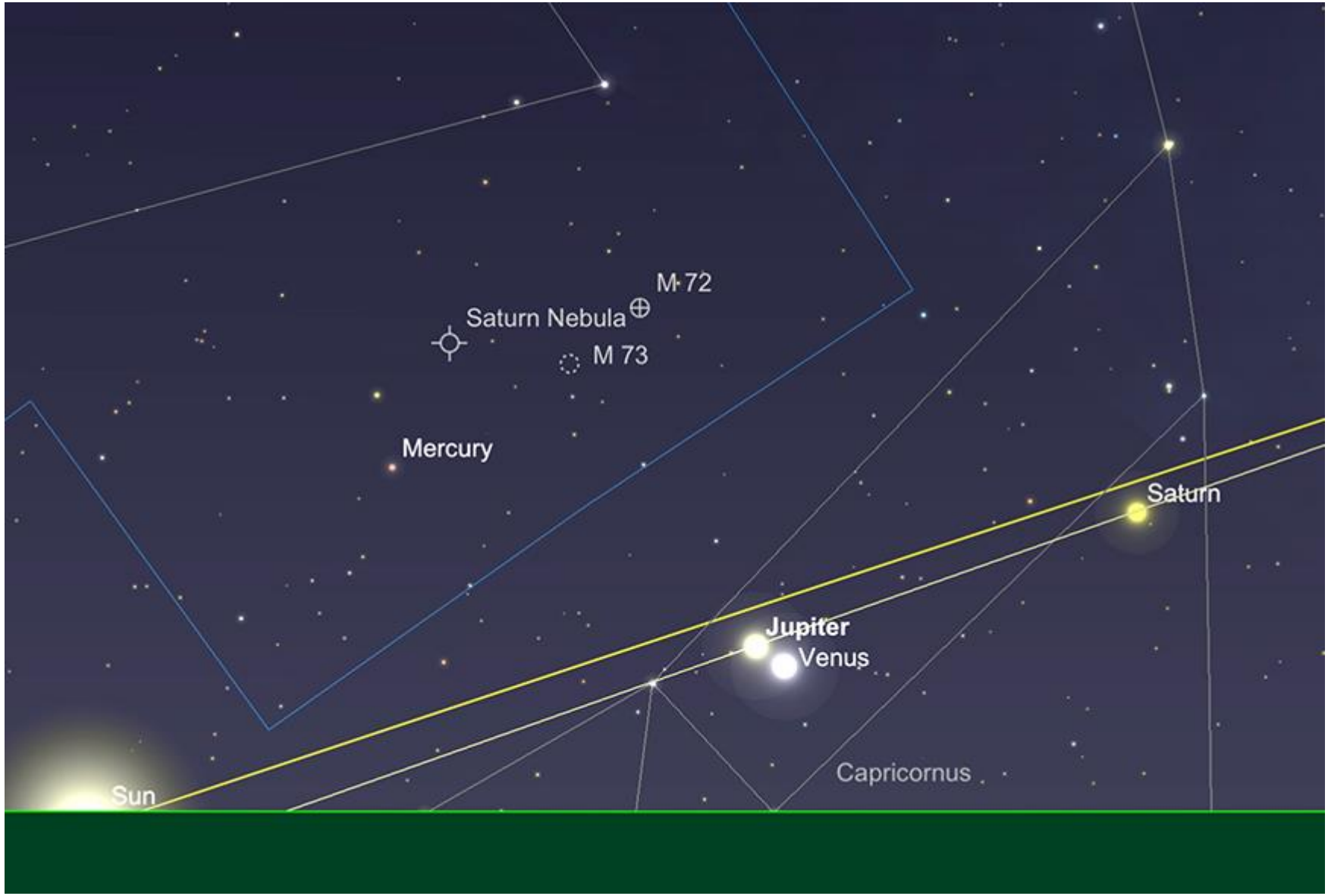
By the 15th, Mars' disk has shrunk to a 7 arc second diameter target, shining at +0.7 magnitude. The planet appears to be climbing northward in the Ecliptic from our perspective and is a very reasonable height from the horizon at transit point - just over 58 1/2 degrees (from 51 degrees N), which it reaches at 5.40pm (GMT).

By the end of February, Mars will present a 6.4 arc second disk. By this point, the planet will be +0.9 mag brightness. Mars will still be worth observing with reasonable magnification in a telescope, but the later in the month it is observed, the less visually enthralling it will appear. It ends the month in a rather picturesque position, just south of M45, the Pleiades star cluster in Taurus.


Phobos
Mars

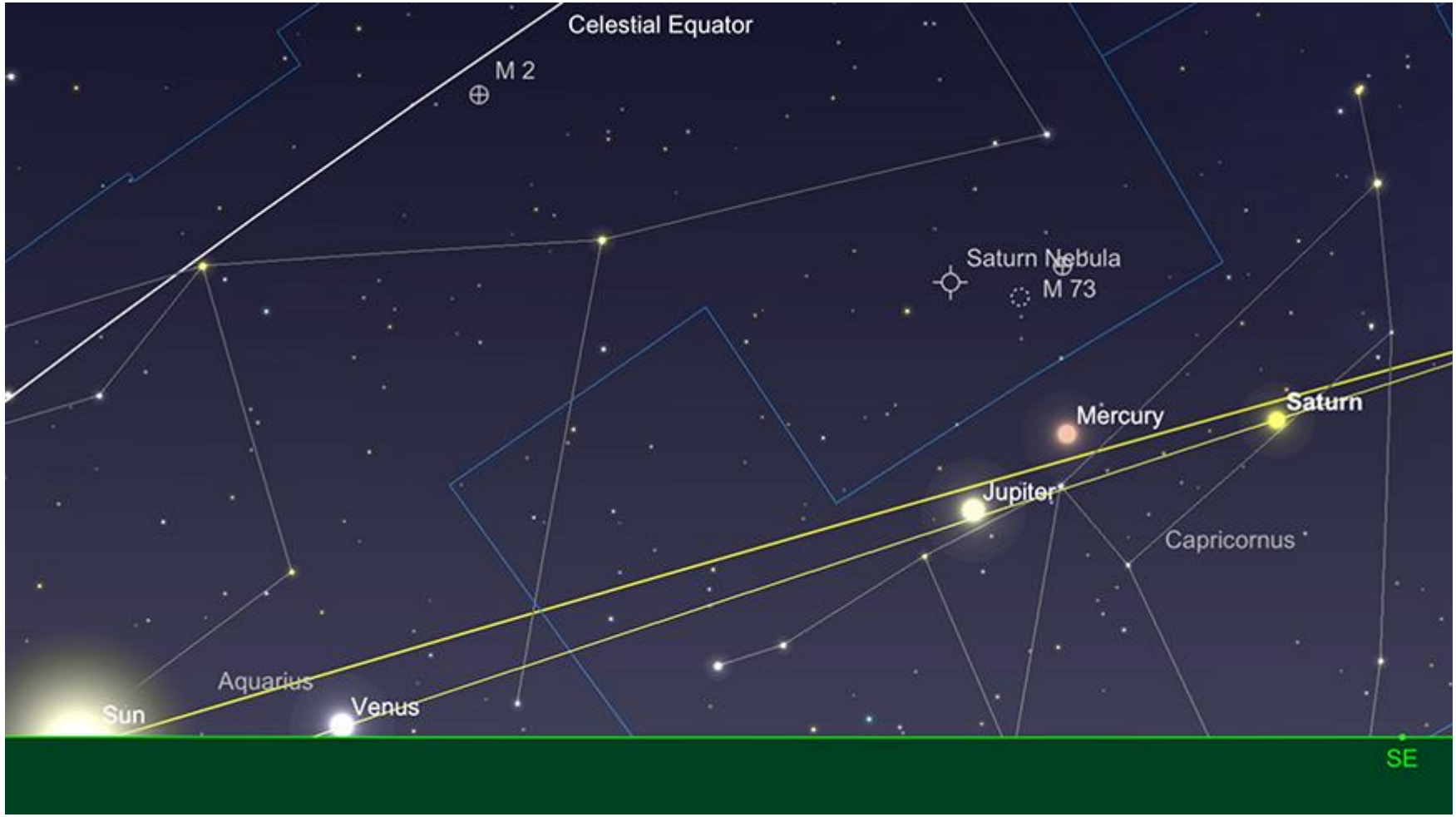
Jupiter

Jupiter reached Superior Conjunction on 29th January. Jupiter slowly emerges as a morning object, though not immediately observable. As previously reported, Jupiter comes together with Venus on the morning if the 11th and can be used to find Mercury at the end of February. As Jupiter is *very* low in the sky from northern hemisphere, it won't appear at its best in telescopes. We will have to wait until later in the year before it is in a more agreeable position for detailed observation.


M 72
Saturn Nebula
M 73
Mercury
Saturn
Jupiter
Venus
Capricornus
Sun

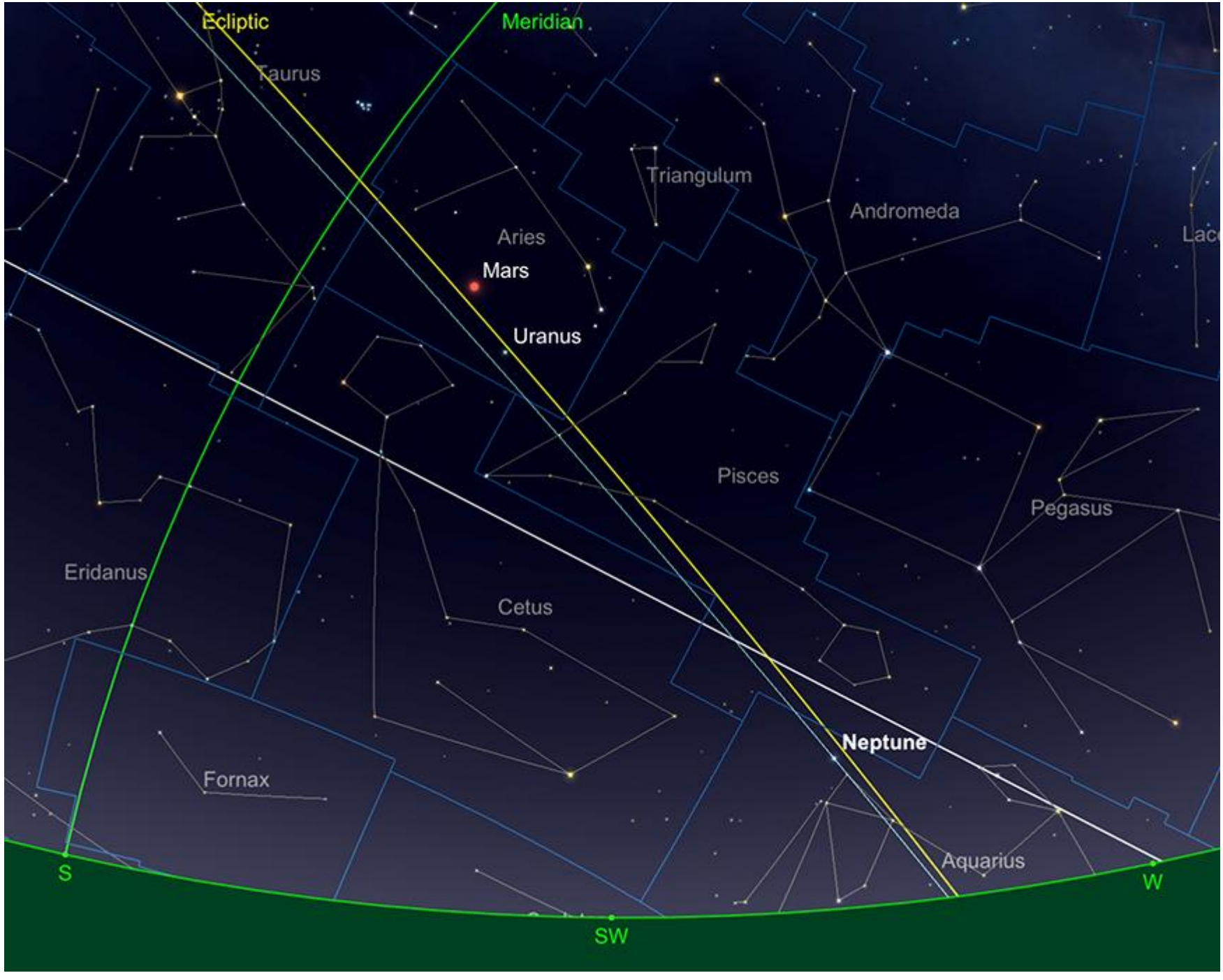
Saturn

Similarly to Jupiter, Saturn's visibility in the mornings is limited. Sitting just over 8 degrees 1/4 to the west of Jupiter, at +0.7 magnitude, at the month's beginning, the Ringed Planet will remain at the same brightness throughout the month. As with Jupiter, Saturn position is not optimal for telescopic observations, but as the month progresses becomes easier find in the morning twilight as separation from the Sun increases.

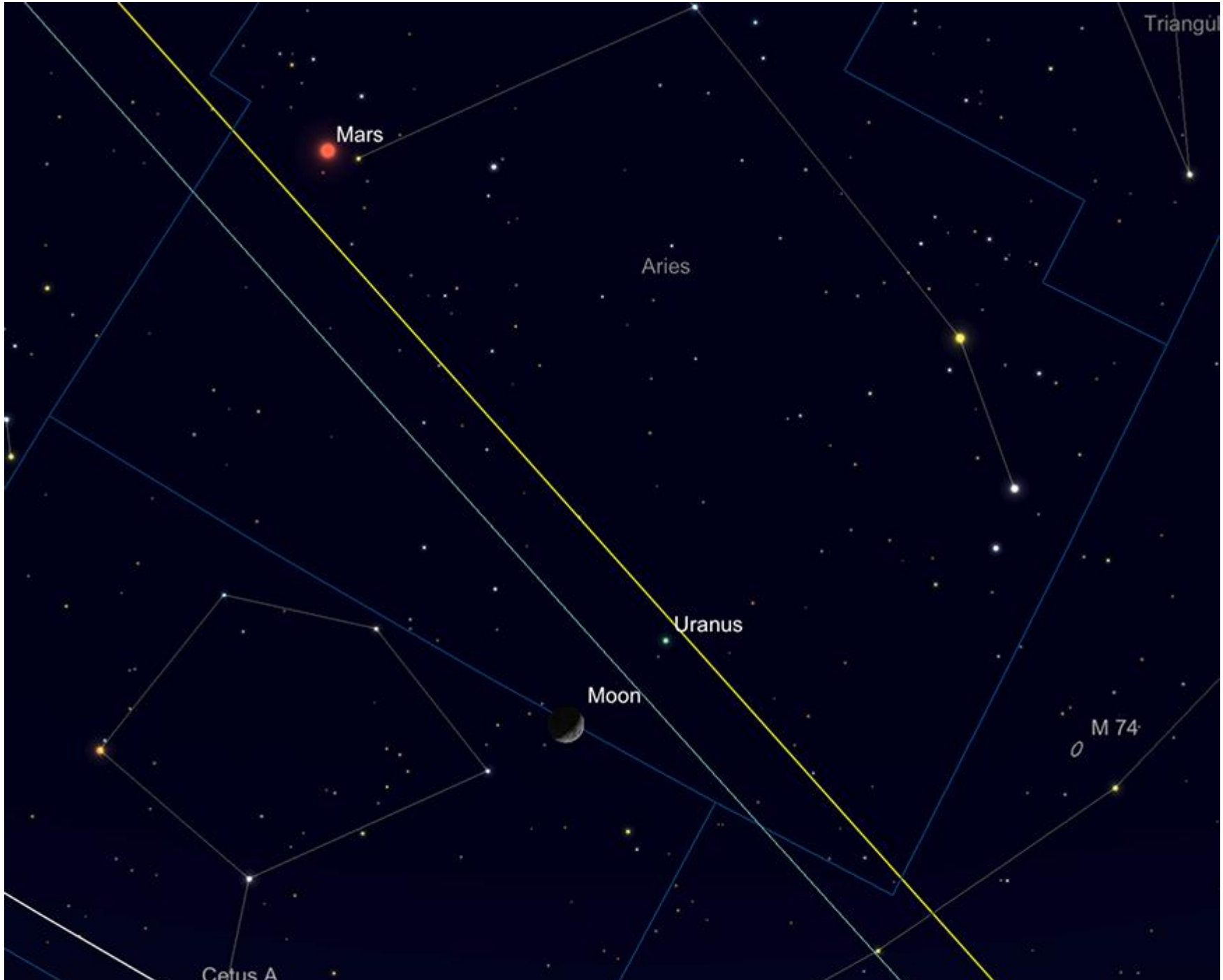


Uranus and Neptune

The two outer gas giants are a tale of two situations. The fainter Neptune is further west within the Ecliptic than Uranus and subsequently rises and sets earlier. At the beginning of February, Neptune is a +7.9 magnitude, 2.2 arc second diameter target in Aquarius. By the time astronomical dusk has ended at just before 7pm (GMT) on the 1st, the planet will be just 12 1/2 degrees high in the sky, making the window for observation very short. As the month progresses this window becomes shorter and shorter, as Neptune approaches Superior Conjunction in early March.


Ecliptic
Meridian
Taurus
Triangulum
Andromeda
Aries
Mars
Uranus
Pisces
Pegasus
Eridanus
Cetus
Neptune
Fornax
Aquarius
S
SW
W

Uranus will be much easier to find at +5.8 mag and presenting a 3.6 arc second diameter disk. The planet transits at a little before 6pm (GMT), setting around 7 hours later. Uranus is to be found much higher up in the sky than Neptune, and will reach a maximum separation from the horizon of just under 53 degrees (from 51 degrees N) a it transits. Mars continues to signpost Uranus to the north east, with the two very different worlds separated by just over 6 degrees on the 1st. This will give assistance to those who haven't found Uranus before. Given a dark enough sky, it is possible to find Uranus with the naked eye. However, we would always recommend the use of binoculars or a telescope under anything other than ideal conditions. On the evening of the 17th, the Crescent Moon (just over 3 degrees to the south) will provide another pointer, though proximity of the Moon may make the surrounding sky too bright to see Uranus ,if the sky is somewhat misty. But if the sky is clear and seeing conditions are reasonable, it should be straightforward enough in binoculars and smaller telescopes.


Triangul
Mars
Aries
Uranus
Moon
M 74
Cetus A

Comets

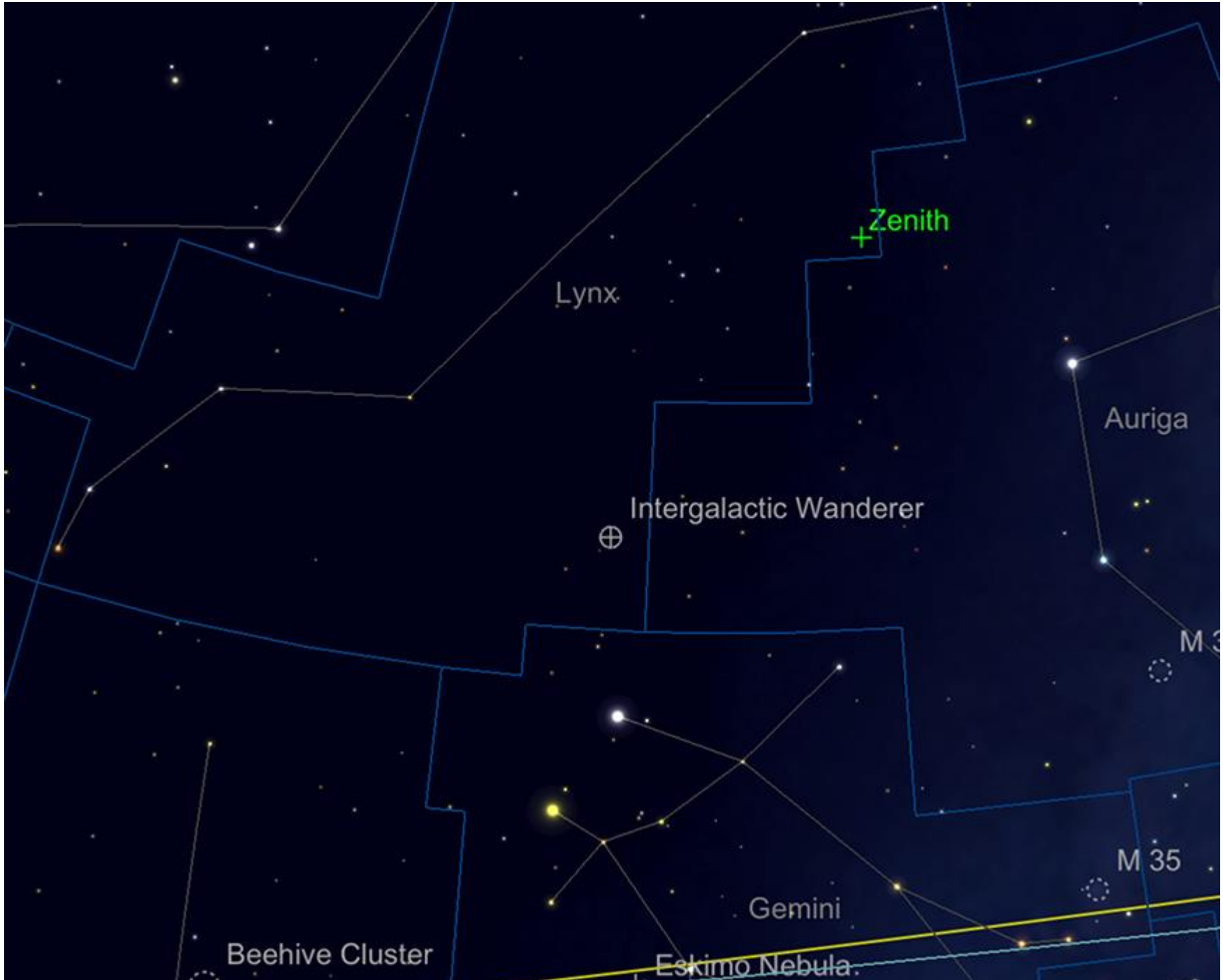
Comet 2020 S3 Erasmus is still emerging from close encounter with the Sun. It had proved somewhat brighter than initially predicted, peaking at around +3 magnitude in SOHO solar images. However, at time of writing is still emerging is reported to be fading and will thus be a difficult target. The comet will track NE through Aquarius during February, but the Sun, now headed northward in its path through the Ecliptic, will keep pace with its progress somewhat, so it won't be more readily observable until the Spring, by which time it will have faded.

Recently discovered in January, C/2021 A1 Leonard looks like it will be a comet to look forward to, as it passes Earth by 0.23 AU in December 2021, just prior to perihelion. It is predicted to reach around the 4th magnitude, so could well be a good binocular and telescopic sight. We'll keep you posted on developments of this comet closer to the time.

Meteors

There are no major meteor showers in February.

Deep Sky Delights in Canis Minor, Gemini and Lynx


Zenith
Lynx
Auriga
Intergalactic Wanderer
M 35
Gemini
Beehive Cluster
Eskimo Nebula

Canis Minor, the Little Dog, is a compact constellation, notable for its bright star Procyon, which at +0.34 magnitude, is the 8th brightest star in the sky. Procyon is notable as one of the nearest stars to our own solar system, sitting some 11.4 light years away - making it our14th closest stellar neighbour. Procyon is a binary star, whose constituents are the main A star a white main sequence star of spectral type F5 and a companion, B, which is a white dwarf (type DA). This companion is a very difficult star to observe, but perturbations in observations of A's proper motion gave it away in 1840 - and by 1861 its orbit had been worked out, yet visual confirmation of B had to wait until a little later. Procyon B was finally observed in 1896 by the Lick 36-Inch Refractor. It remains a very difficult object to observe, even in large telescopes, as its angular separation with the primary star is so small. This and the difference in brightness +0.4 mag for A +10.8 mag for B, mean it is rarely seen and requires exceptional conditions to even attempt. The two stars are currently separated by 3.9 arc seconds, which roughly approximates to 15 AU actual separation - roughly the distance from the Sun to Uranus.

Procyon is a compound of the Greek for "preceding the dog" - the root meaning of this name comes from the fact that this star was observed to rise just before Sirius, in Canis Major and had great significance to ancient observers because of this. Ancient Arab myth saw the two main stars of both constellations as sisters, the elder of which, Sirius kept over the "river" of the Milky Way, which now runs between them. The younger of the Sisters, Procyon, was afraid and stayed on the original bank and wept . It was these tears that fed the celestial river of the Milky Way and eventually drained into the Nile, causing it to flood. The reappearance of both stars rising in the evening each year precedes this event - and thus the legend was born. Indeed, Beta Canis Minor, to be found to the NW of Procyon is named Gomeisa. which translates from the Arabic "little teary (or bleary) eyed one" - a literal link to this legend

Moving northward into Gemini we come to the twin stars of Castor and Pollux, Alpha and Beta Geminorum, respectively. Pollux, the Beta star is actually brighter than Castor, the Alpha - and while it has been suggested that when Bayer codified the brightness classification of stars in the 17th century, Castor was the brighter of the two, this is extremely unlikely.

Castor is a fine double star and an easy target in small instruments. Consisting of two stars, A and B, of +2 and +2.9 mag respectively, Castor's elements are currently widening and are separated by 4.5-5 seconds of arc. Castor's double nature was discovered in 1678 by Cassini (he of Saturn's ring division fame, amongst many other discoveries) and bears the distinction of being the first gravitationally bound object to be identified beyond the reaches of the Solar System. Castor A and B's orbit about a mutual gravitational point takes around 467 years to complete, but both stars are also in turn doubles, with much fainter M-class dwarf companions. In addition to these companions there is also present in the system a further pair of gravitationally bound M-class stars. This makes Castor not just a double star, but a sextuple - quite a collection! Sadly, only the primary elements are observable in amateur instruments.

To the westerly reaches of Gemini, is to be found M35. M35 is a very prominent star cluster, at +5 mag, easily picked in small telescopes and binoculars and can also be seen with the naked eye from a reasonable site. Consisting of well in excess of 100 observable stars (mags 6-13th), M35 was first noted by Astronomer Philippe Loys de Cheseaux in 1745. Also included in the Uranographica Britannica by John Bevis in 1750, M35 was catalogued by Messier in 1764, who credited Bevis with its discovery.

Many of the 100+ observable stars are types G and K stars - similar in class to our Sun - though these seem to be of a considerably larger mean size than main sequence. M35 is tentatively aged at about 100 million years - about the age of the nearby M45, (the Pleiades) though problematically, stellar evolution is thought to be considerably more advanced in the case of M35. Does this mean that M35 is in fact older, or are the Pleiades actually younger? Further observation and theories will be needed to explain this anomaly.

In the background sky to M35 lies the fainter (+8 mag) open cluster NGC2158, though this is nearly six times further away than M35's 2800 light years. In addition to this, there is also the yet fainter and more compact IC2157 cluster (+8.4 mag) - making this an extremely rich area for sweeping with virtually any type of optical aid.


M35 & NGC2168 Open Clusters
© 2019 Mark L Blundell

Drifting eastward, 2 1/3 degrees east of the star Wasat (Delta Geminorum) is the fabulous Eskimo Nebula, NGC2392. This Planetary Nebula supposedly resembles an Eskimo's head, surrounded by the fur of an Arctic Parka hood. A reasonably compact 0.8 arc minute across (about 2/3rds the size of the Ring Nebula, M57), the Eskimo is only +9.19 mag, though its compact size makes its surface brightness quite high and it takes magnification well. Discovered by William Herschel in 1787, it is perhaps surprising that it wasn't noticed by earlier observers - though this is most likely down to its small size. OIII filters reveal more of the two stages of the object: it's tenuous outer shell and the gleaming, brighter interior. Larger instruments reveal more of the complex structure of the internal part of the Eskimo - its radial double shell of expanding gasses and fine s blown by cosmic winds form its central star. This central star shines at +10.5 mag and is relatively easy to spot in most instruments. The nebula is thought to lie at 2800-3000 light years distance.

Further south from the Eskimo is another older, larger and fainter object - The Medusa Nebula (Abel 21). Whereas the Eskimo is small and comparatively bright, the Medusa is large - at 10 arc minutes across it is a third the diameter of the Full Moon. Telescopes of 8-inches + aperture, coupled with a good OIII filter and a dark site will be needed to seen the Medusa. Although listed as being +10.19 mag, this is spread out over a significant area of sky, so it is in long duration astrophotography that the wonders of the Medusa really start to reveal themselves. A modest aperture telescope will be needed and a sturdy equatorial mount, capable of being autoguided , will be needed to attempt to image this object. Images reveal the serpent-like tendrils of nebulosity that give this mysterious object its name - its namesake Medusa being the Gorgon who had snakes for hair in classical Greek mythology. The stare of Medusa was reputed to turn people to stone, though staring at this nebula through a large telescope will be a much more pleasant experience… The Medusa lies about half the distance from us as the Eskimo Nebula - 1500 light years and is around 4 light years in diameter. Opinions were divided on the true nature of the Medusa: George Abel, its discoverer thought it to be an old planetary nebula, whereas many considered its irregular nature to indicate it was a supernova remnant. Narrowband imaging has revealed the true extent of the Medusa's helical hourglass figure - making it much more likely to be, as Abel initially suggested, a planetary nebula.

Drifting northward, we come to the large, sparce constellation of Lynx. which contains a couple of interesting objects for Deep Sky enthusiasts.

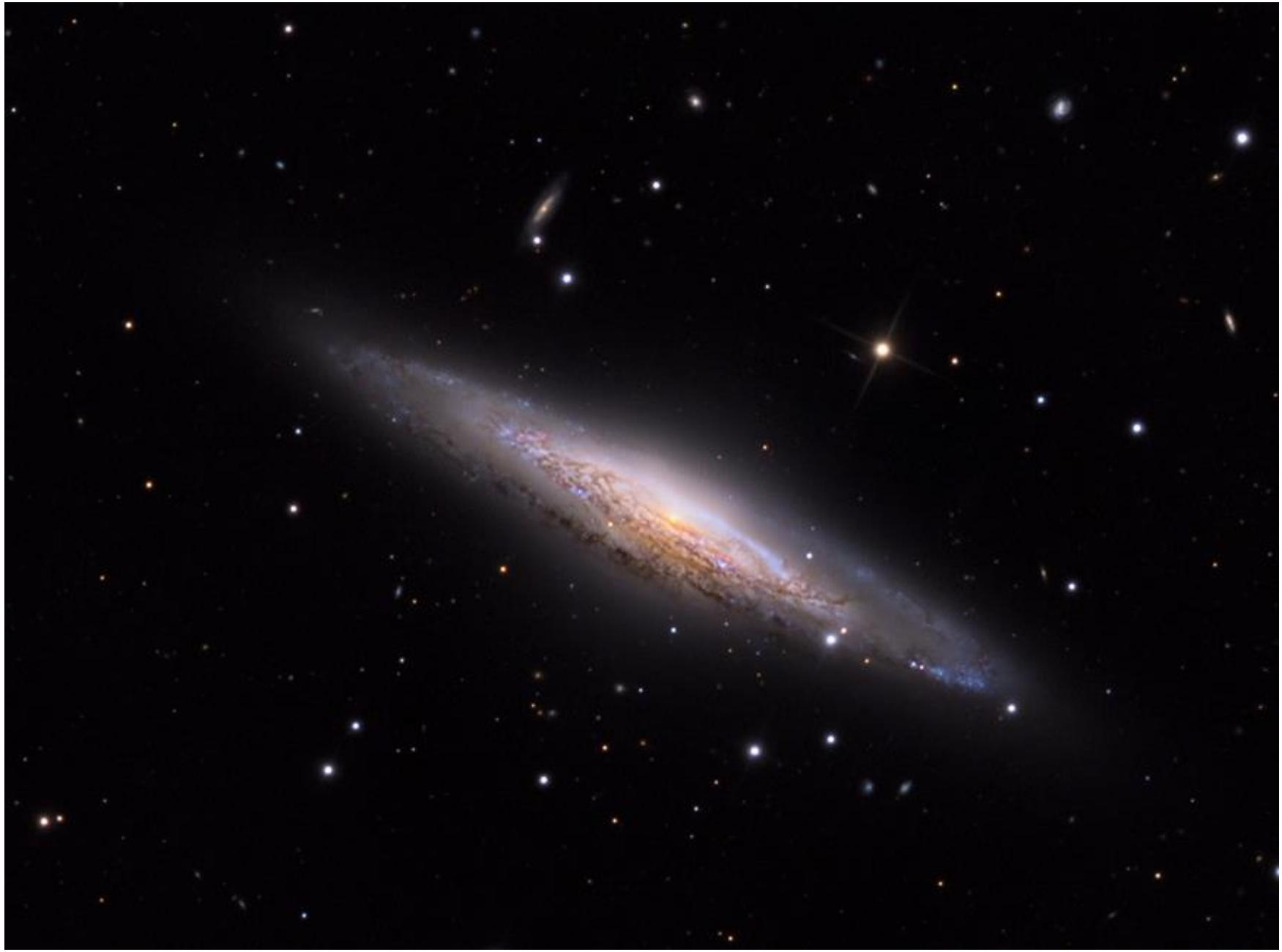
The first object of note is NGC2419, the Intergalactic Wanderer, a rather dim globular cluster, which lies some way away from the regular haunt of the globular - the shell around the central part of the Milky Way. The Intergalactic Wanderer was nicknamed as such, due to the fact it used to be thought as an extra-galactic cluster, wandering through space. Observations of its motion have revealed it is not - it is indeed a satellite of our galaxy, much as the other major globulars are - in NGC2419's case just a very outlying one. At 270,000-300,000 light years from us, it is almost twice as distant as the Large Magellanic Cloud, but intrinsically very luminous. It almost matches the King of Globular clusters, Omega Centauri, for true brightness, but appears as a rather feeble +10 mag object at just 1.8 arc minutes across, simply because it is so far away. Larger telescopes will be needed to see much of it, though it is possible to pick out in smaller instruments from dark locations.

Lynx, whilst obscure to the naked eye observer, also contains a couple of galaxies of note, NGC2537, otherwise known as the Bear Paw Galaxy and NGC2683, The UFO Galaxy.

The Bear Paw is a barred spiral is located roughly in the centre of Lynx, 9 1/2 degrees to the north of the Intergalactic Wanderer and some 14 3/4 degrees to the NW of NGC2683 - giving a good idea how large Lynx is as a constellation. The Bear Paw is a very compact object, being some 1.7 x1.5 minutes of arc across - and although officially classed as a +11.69 mag object has a high surface brightness because of its diminutive area and is rather more visible than many objects of similar listed magnitude. The Bear Paw is so-called due to the areas of brightness which form a patchy pattern, which somewhat resemble the paw print of an animal. Whether it is that of a Bear or not, we leave you to draw your own conclusions... NGC2537 is thought to lie some 22 million light years away from our own Milky Way Galaxy.

Discovered in 1788 by William Herschel, NGC2683, otherwise know as the UFO Galaxy (for obvious reasons), is a spectacular object which lies almost edge on to our line of sight on Earth and subsequently has a very reasonable surface brightness. Covering an area of sky 9.3 x 2.1 arc minutes, NGC2683 is easily seen in large telescopes, whereas smaller scopes will just resolve its bright elongated core. The foreshortened spiral arms of the UFO galaxy are laced with dust lanes, one of the major examples of this practically bisects the core from our perspective.

It is thought that NGC2683 is reasonably close to the Milky Way group, from a cosmic perspective, though different sources list its distance as a widely variable 16-33 million light years away. The UFO Galaxy's core is often remarked upon as appearing yellow - indeed, it seems that there are a larger population of older yellow and red stars in this galaxy than average and that there is little star-forming activity taking place within the system. Compared to our galaxy, though less massive and luminous, NGC2683 boasts twice the number of globular clusters.



Text: Kerin Smith