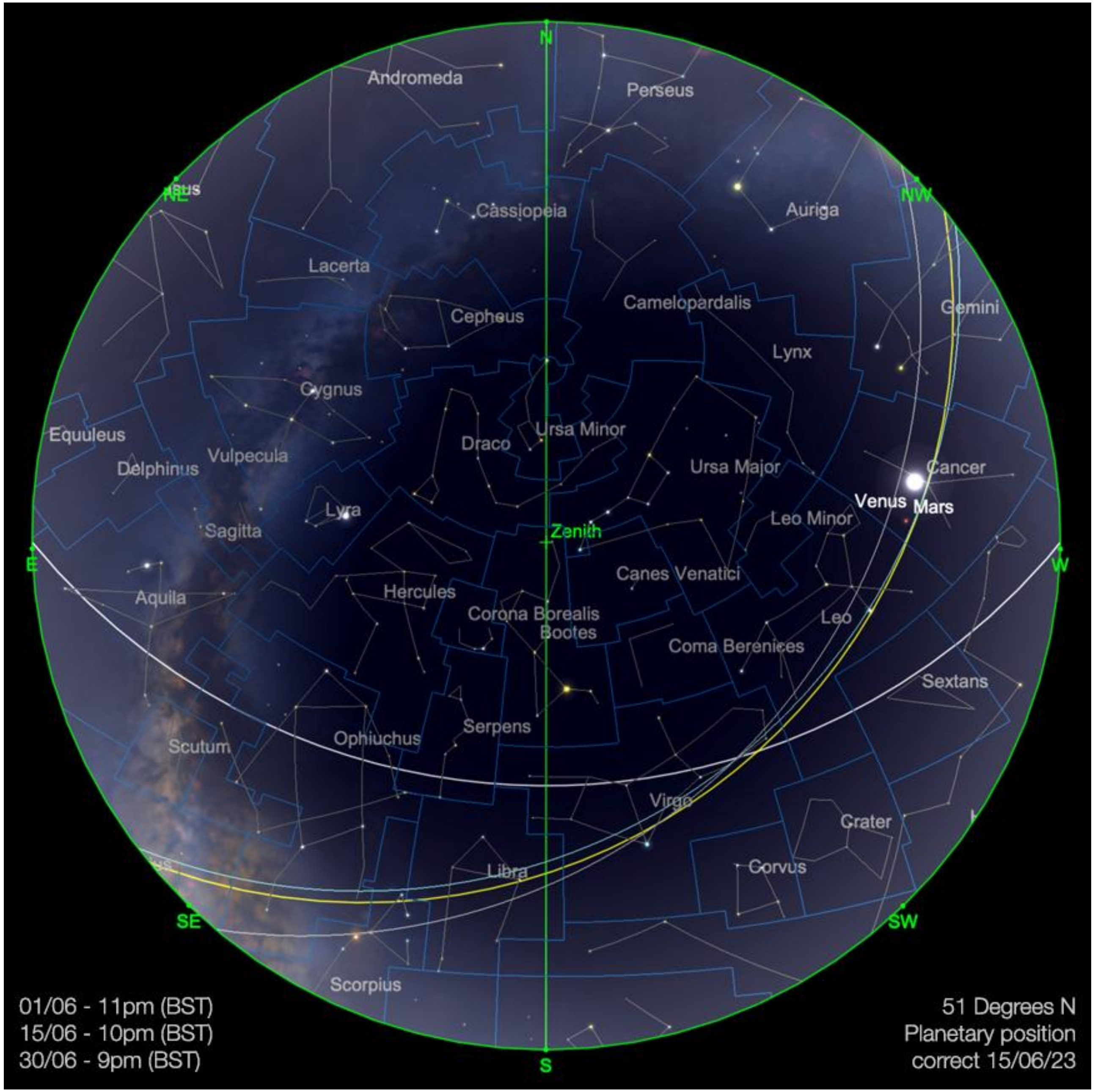

Telescope House June Sky Guide
The most up-to-date guide to Planetary and Lunar activity,
Comet News, plus Deep Sky Delights...


N
Andromeda
Perseus
NE
Cassiopeia
Auriga
NW
Lacerta
Cepheus
Camelopardalis
Gemini
Lynx
Cygnus
Equuleus
Ursa Minor
Draco
Delphinus
Vulpecula
Ursa Major
Cancer
Venus
Mars
Lyra
Leo Minor
Sagitta
Zenith
E
W
Canes Venatici
Aquila
Hercules
Corona Borealis
Bootes
Leo
Coma Berenices
Sextans
Serpens
Ophiuchus
Scutum
Virgo
Crater
Corvus
Libra
SE
SW
Scorpius
S
01/06 - 11pm (BST)
15/06 - 10pm (BST)
30/06 - 9pm (BST)
51 Degrees N
Planetary position
correct 15/06/23

June holds great significance for astronomers in many ways. For those of us residing in the Northern Hemisphere, June represents the brightest part of the year. This is as a result of the Summer Solstice, which occurs on June 21st in the Northern Hemisphere. During this event, the Sun reaches its most northerly point in the Ecliptic, resulting in the highest separation from the horizon at Midday. While we Northerners enjoy the glory of Midsummer, our counterparts in the Southern Hemisphere endure the grip of Midwinter. These extremes, as well as all our seasonal weather on Earth, are caused by our planet's rotational tilt, which is approximately 23.5 degrees from the vertical in comparison to the plane of our orbital path around the Sun.

During the summer season, the hemisphere facing the Sun receives more light, thereby warming up the land and sea. Consequently, the days become longer and the nights shorter as you move closer to the pole. Those residing above the Arctic Circle experience 24-hour daylight during Midsummer. Conversely, the opposite holds true for those in the “trailing” Southern hemisphere.

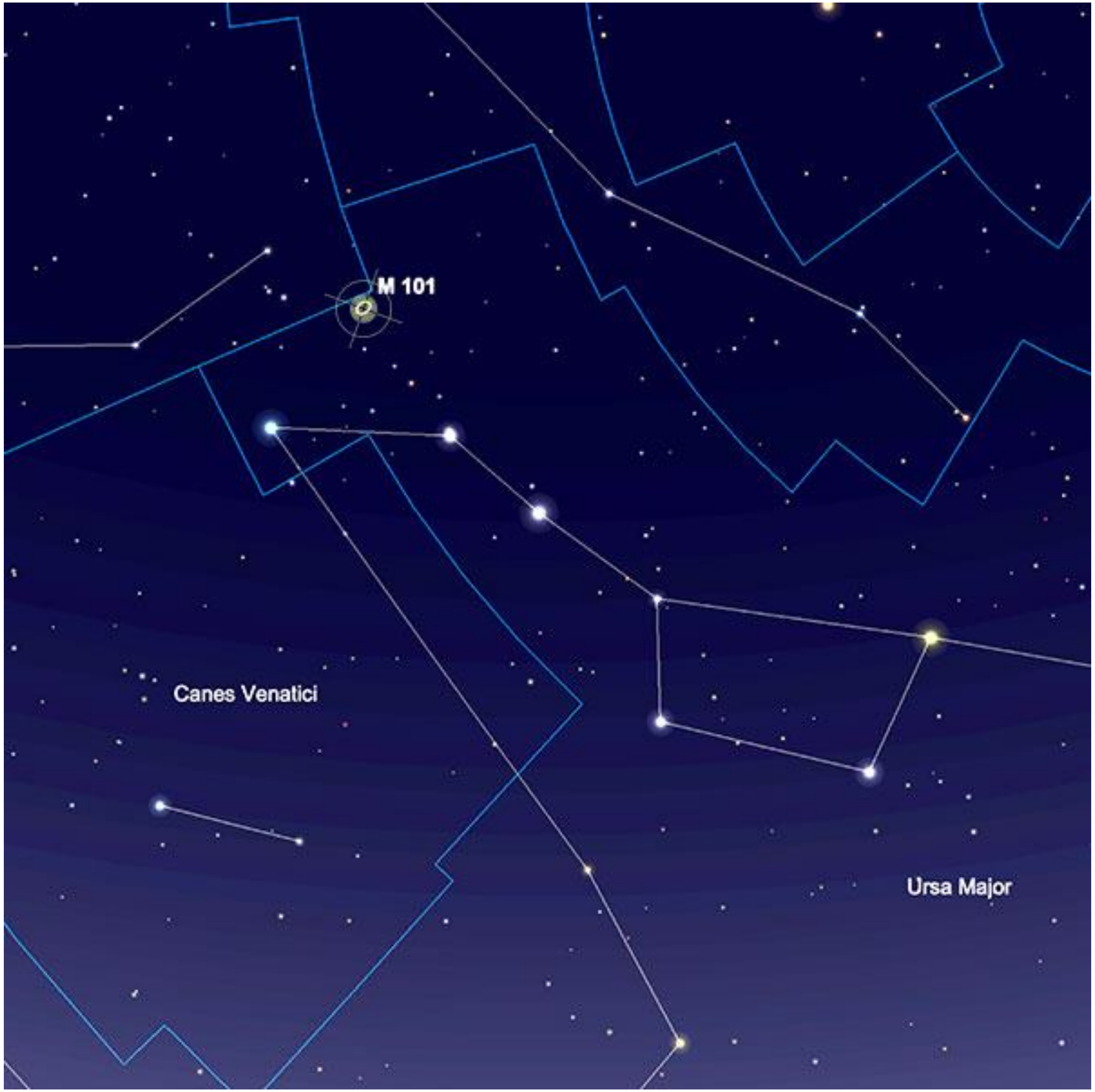
These circumstances noticeably affect the quality of darkness for individuals in temperate Northern latitudes. Even during the deepest part of the night, the Sun is not significantly below the horizon. This phenomenon creates a state of permanent Astronomical Twilight for a while around the Summer Solstice, particularly for those in Northern Europe, the Northern parts of the USA and Canada, and Asia. From the 27th of May to 15th July 2023, individuals in southern UK latitudes (around 50.5 degrees N) experience permanent Astronomical Twilight, meaning that the Sun remains less than 18 degrees below the horizon throughout the night. Consequently, the skies never truly darken, and objects with a magnitude of around 6 or lower cannot be discerned with the naked eye. It is worth noting that the limit of human eyesight typically falls around +6.5 magnitude, although this can vary from person to person. This has understandable implications for the quality of deep sky observation and astrophotography possible during this time of the year.

The further north one ventures, the longer the period of permanent Astronomical Twilight persists. In Manchester, UK (latitude 53.5 degrees N), this period extends from mid-May to the end of July. In Edinburgh (just shy of 56 degrees N), the duration is even longer, lasting from early May to the end of the first week of August. However, in locations 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 does not set at all around the Solstice, while south of the Antarctic Circle, the Sun does not rise during this period.

Supernova SN 2023ixf In M101 (Ursa Major)

When a massive star reaches the end of its life, it undergoes a powerful explosion, creating a dazzling burst of light that can temporarily alter the appearance of the night sky. The most brilliant and nearby supernovae can be observed without any special equipment, while even those occurring in distant galaxies can be easily detected using amateur telescopes from the comfort of your own backyard. A particularly exciting opportunity has now presented itself: A supernova has recently occurred in the neighbouring spiral galaxy M101 (NGC 5457) and you can locate it in the sky tonight. While this Supernova emphatically won't be casting shadows anywhere on Earth, it is located in a well-known and easy to find object and well in the rear of many amateur telescopes.

As shown in the chart above, M101's location is very easy to find: the galaxy sits at the peak of a triangle formed by the two stars at the end of the handle of The Plough, or Big Dipper - Mizar and Alkaid. You can actually follow a small trail of fainter stars: 81 UMa, 82 Uma, 83 Uma and 86 Uma up from Mizar's famous companion star Alcor and find M101, at the end of this trail.


M 101
Canes Venatici
Ursa Major

The newly discovered supernova, named SN 2023ixf, was initially identified by Koichi Itagaki on May 19th. Itagaki spotted the supernova when it was 14.9 magnitude, but it rapidly increased in brightness over last weekend. Astronomers then examined data from the Zwicky Transient Facility and uncovered the earliest evidence of the supernova two days prior to Itagaki's discovery.

With its current visibility, thought to be around magnitude 11 and thus visible in telescopes of 4-inch aperture and above (from a reasonably dark observing site), SN 2023ixf is anticipated to remain observable through amateur telescopes for several months, making it a distinctive target for observation throughout the summer.

Naturally, this is a great potential target for imaging as Keith Jones' picture below shows:


SN 2023ixf
Image credit: Keith Jones

The Solar System

The Sun

The Sun continues to increase in activity and has shown some particularly spectacular displays of Sunspots and Prominences of late. Unlike many other members of the Solar System, you can actually see the Sun's surface features and atmospherics develop over the space of a day. The Sun's dynamism is quite unlike anything else in the sky to observe.

The Sun taken in late May by Telescope House's Kerin Smith, using a Lunt 60mm H-Alpha telescope.

The Moon

Our natural satellite wends its way around the Ecliptic as usual. Starting on the 1st, the month begins with the Moon in Waxing Gibbous Phase, appearing as a 93% illuminated target, low in the southern sky after sunset, in the constellation of Libra. Fast forward a few days to June 4th and the Moon will have transitioned to Full. It will have drifted into the neighbouring constellation of Scorpius by this point. Rising at around 10.30pm from European locations, it will transit at around 1am and set at 4.45am. We labour the obvious at this point: this part of the month will not be the best for deep sky viewing or astrophotography - with the Moon compounding permanent astronomical twilight for many observers.

Past this point, the Moon will slowly start to contract in phase. Passing through the extremes of the southern part of the Ecliptic through Sagittarius, Capricornus and on into Aquarius, when it will join Saturn on the early morning of the 10th, where it will also reach Last Quarter phase.

The Moon trails through Pisces and Cetus over the next few days, its crescent gradually getting thinner and thinner. On the morning on the 14th, the Moon can be found very close to the planet Jupiter, both now in Aries - the two worlds separated by just under half a degree, at closest approach.

The Moon will continue to wane as it moves through the constellation of Taurus, where it will meet the Sun and become New on the 18th. After this point, the Moon will re-emerge as an evening object, slowly becoming visible as its crescent phase increases.

On the evening of June 21st, the Moon will come into fairly loose conjunction with the very prominent Venus - and the distinctly less noticeable Mars - on the Cancer-Leo borders. The three will be found almost due west as the Sun goes down.

The Moon then begins its long trek through the large constellations of Leo and Virgo, expanding its phase as it does so. It comes to First Quarter phase in western Virgo on the evening of the 26th, spending another couple of days within the sky's largest constellation, before exiting into Libra on the 29th. It's in Libra, with the Moon a couple of days off Full again, that we end June from a lunar point of view.

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.

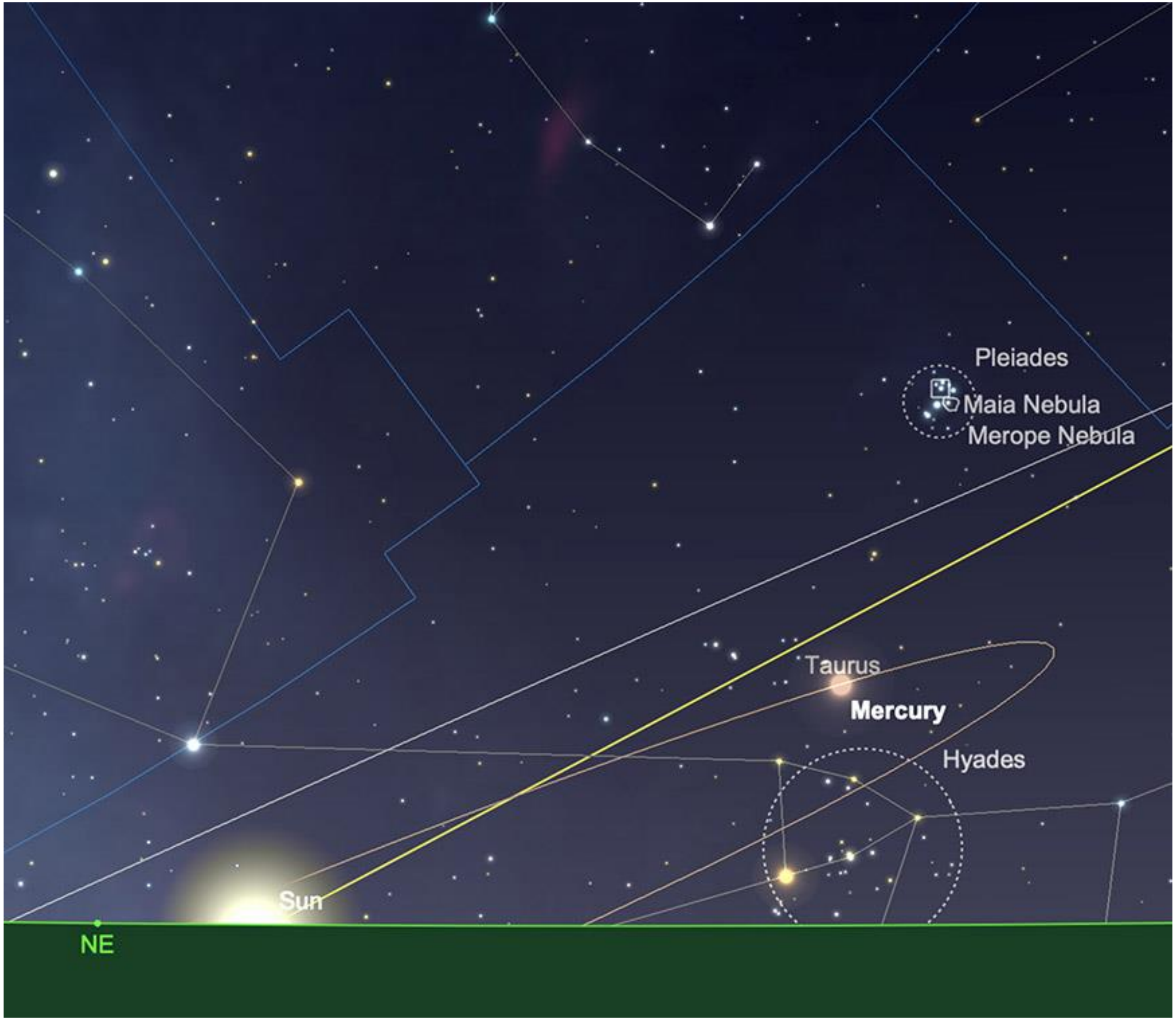
Mercury

Mercury begins June in a very unfavourable position as far as temperate northern hemisphere observers are concerned. While the planet is just past maximum western elongation and very well-placed for observation from the equatorial regions of the Earth, it is situated in a very shallow-rising part of the Ecliptic and reaches just 5 degrees elevation at sunrise from 51 degrees N. The planet is +0.4 magnitude on the evening of the 1st.

As the month progresses, Mercury brightens a little - by the morning of the 15th it is -0.6 magnitude and now stands around 6 1/2 degrees high as the Sun rises (from 51 degrees N).

The latter half of the month sees Mercury sinking further sunward, though the planet brightens significantly as it does so. By the time we reach the morning of the 23rd, Mercury displays a -1.4 magnitude, 92% illuminated disk, which is 6.4 arc seconds in diameter. While the planet is just under 10 degrees from the Sun and stands just 4 1/2 degrees above the horizon as the Sun rises, ironically, it will be easier to locate than it was at the month's beginning.

Mercury is looping around behind the Sun, as seen from our perspective on Earth and will reach Superior Conjunction (the opposite side of the Sun) on 1st July. The last week of June sees the planet hit close to maximum brightness (it reaches -1.9 and -2.1 magnitudes respectively, on the mornings of the 28th and 29th). Unfortunately, by this time it will be very close to the Sun and subsequently unobservable.


Pleiades
Maia Nebula
Merope Nebula
Taurus
Mercury
Hyades
Sun
NE

Mercury, sunrise, 15th June. Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

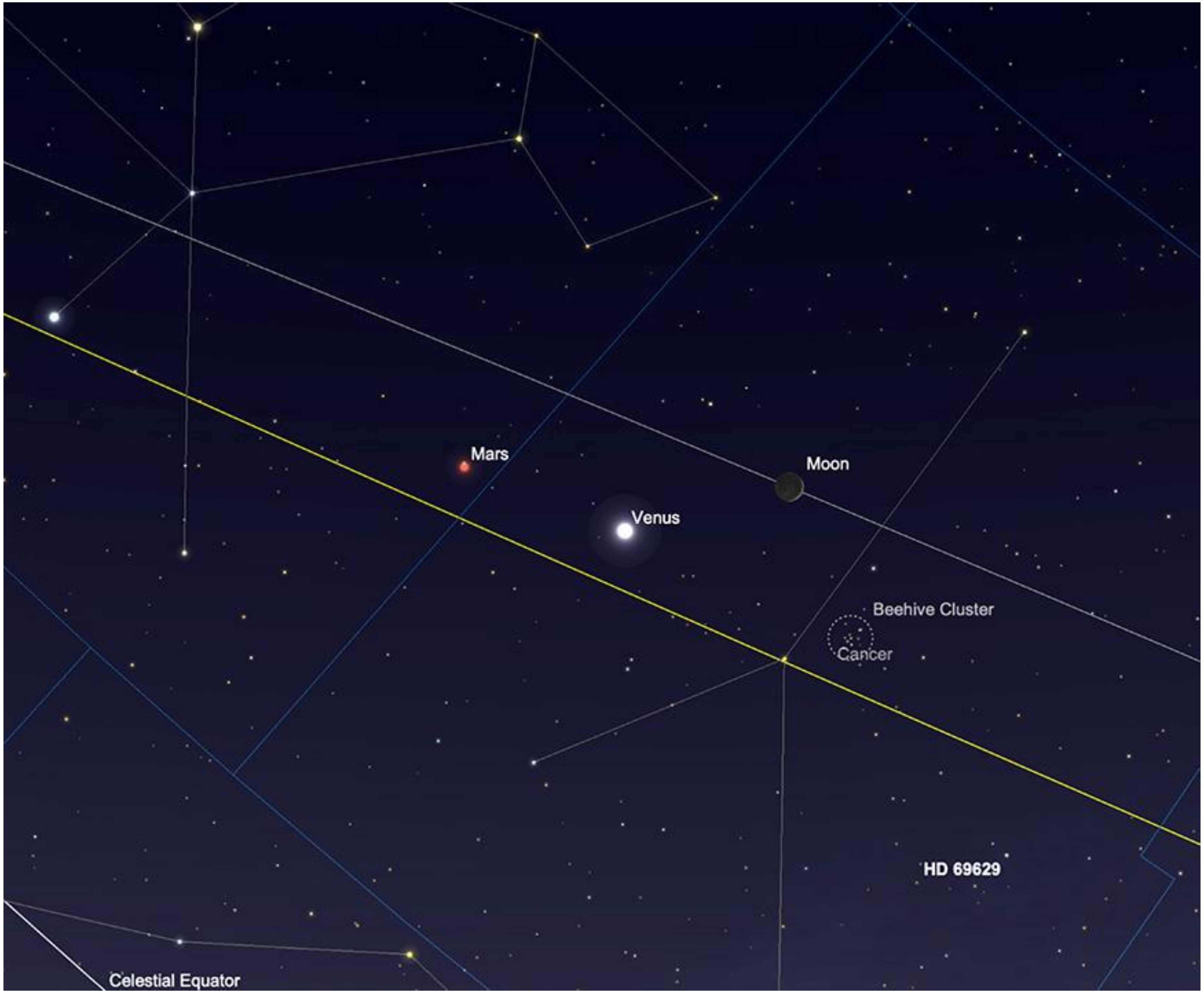
Venus

Our nearest neighbour (planetary-speaking) continues to put on a fine display in the evening sky. The 1st finds Venus at -4.3 magnitude, displaying a 51.3% illuminated disk of 22.8 arc seconds diameter. As the Sun sets (from 51 degrees N), the planet will stand just over 29 degrees high, almost due west.

Venus reaches maximum eastern elongation on the 4th June and presents a half phase similar to a First Quarter Moon (albeit a lot smaller). At this point, it is a maximum 45 degrees separation from the Sun.

As the planet continues to swing around the Sun on its faster interior orbit, it gets ever-closer, increasing its angular size and brightness, while decreasing its phase as it does so. By mid-June, Venus will be -4.4 mag and 27 arc seconds diameter, but will have decreased its phase to 42.9% illuminated.

Moving forward to the end of the month, the situation has developed further. On the 30th, Venus is a dazzling -4.5 magnitude and now presents a 33.2% illuminated, 33.4 arc second diameter disk. The only downside of this increase in brightness and angular size is that it comes at the expense of height above the horizon and inevitably separation from the Sun. On the evening of the 30th, Venus stands just over 18 degrees high in the west as the Sun sets.


Mars
Moon
Venus
Beehive Cluster
Cancer
HD 69629
Celestial Equator

Venus, Moon and Mars, sunset, 21st June. Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

Mars

The Red Planet is to be found in Cancer as the month begins - though at a rather disappointing +1.6 magnitude, would be fairly easy to overlook, were the rather demure Cancer blessed with brighter principal stars.

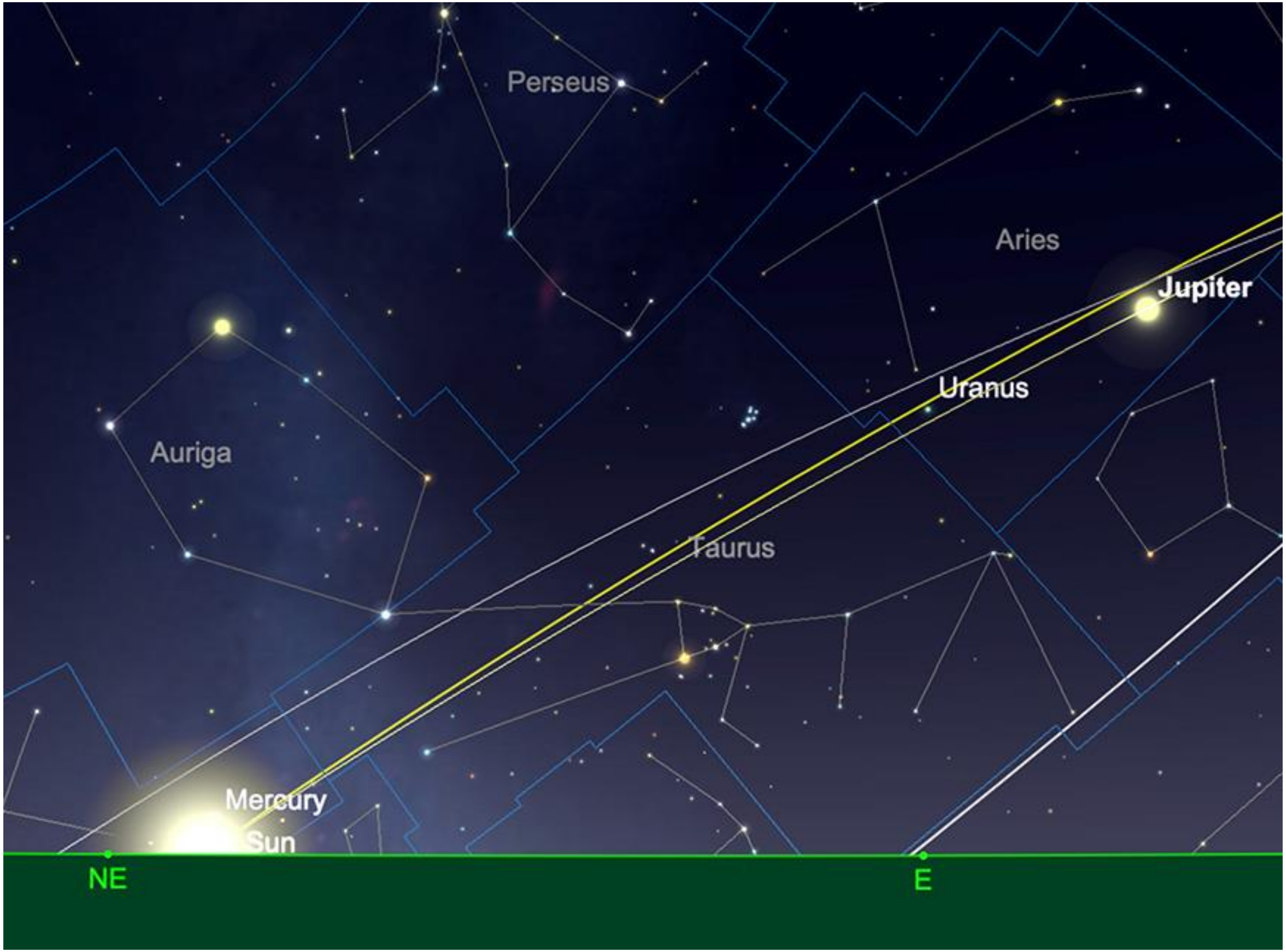
Mars is not too far from Venus, located in neighbouring Gemini, but the contrast between the two worlds could not be starker. At just 4.7 arc seconds diameter, on the evening of the 1st, Mars is a very meagre target. And the situation only gets less inspiring as the month progresses - by the end of June, Mars has dimmed to +1.7 mag and now presents a 4.2 arc second diameter disk.   It ends the month having crossed the border into Leo.

Jupiter

Jupiter is a morning target in Aries and has now emerged from the glare of post-superior conjunction to be a worthwhile, if rather low target for those of us observing in the temperate northern hemisphere. At -2.1 magnitude, Jupiter stands around 12 1/2 degrees high in the east at sunrise, separated from our parent star by around 36 degrees on the morning of the 1st.

As previously mentioned, Jupiter comes into close conjunction with the very old Crescent Moon on the 14th, which will present a lovely sight for the early riser. By mid-month, Jupiter won’t have changed dramatically at all from the beginning of June in terms of brightness or angular size.

By the time we get to the end of the month, Jupiter will have increased brightness fractionally to -2.2 magnitude and now shows a 36.5 arc second diameter disk. However, it is now significantly higher in the sky at sunrise - over 28 degrees elevation, as seen from 51 degrees N.



Perseus
Aries
Jupiter
Uranus
Auriga
Taurus
Mercury
Sun
NE
E

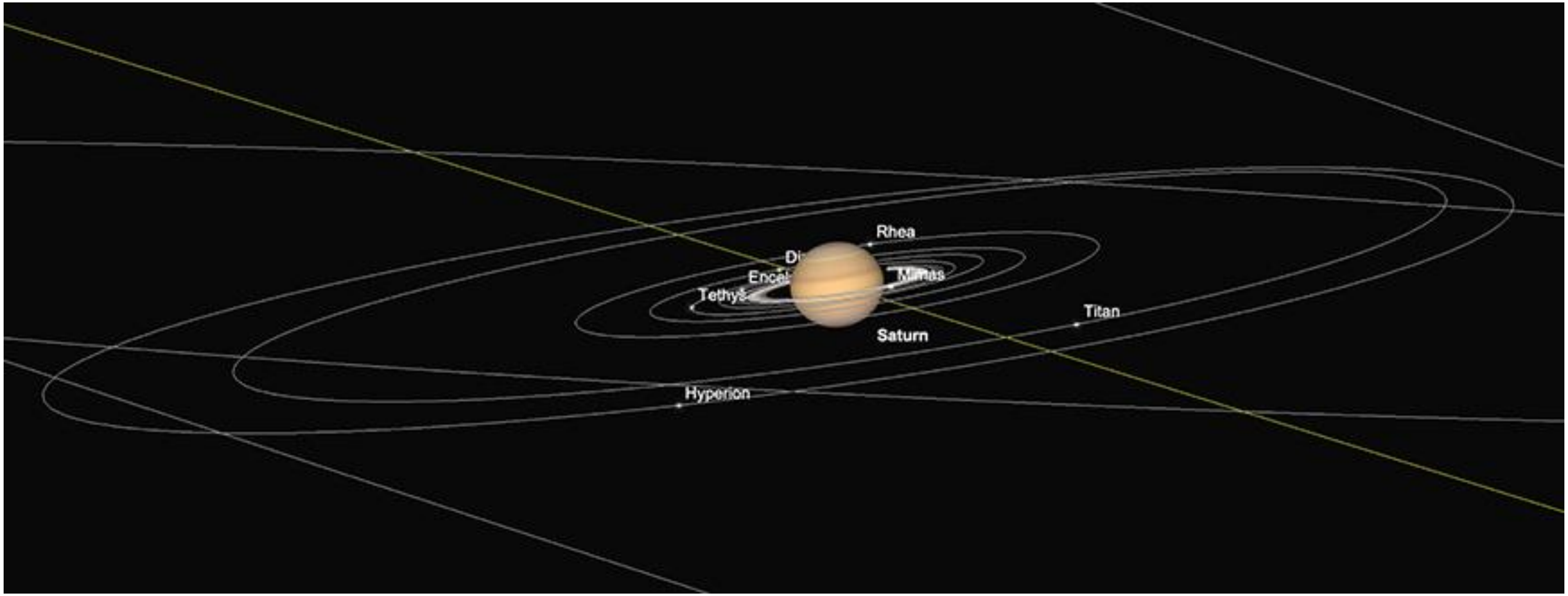
Jupiter, Sunrise, 30th June. Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

Saturn

Saturn is further west of Jupiter, in the constellation of Aquarius. At +1.0 magnitude on the 1st it is (as always) significantly fainter, but easy enough to locate in this rather barren part of the sky.

Saturn is just over 17 arc seconds diameter and stands around 22 1/2 degrees high in the SE (from 51 degrees N) as the Sun rises.

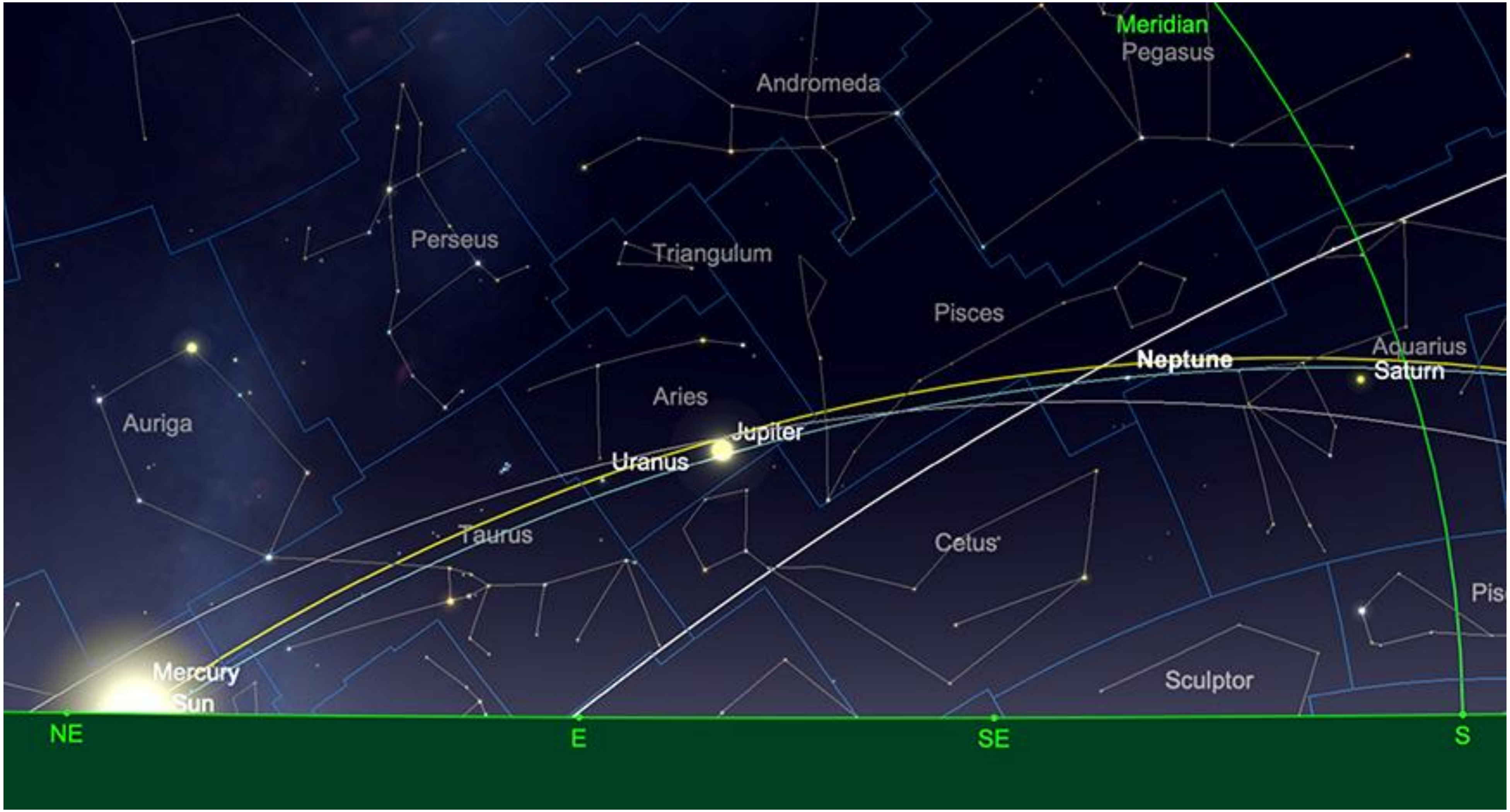
By the time we reach the end of June, Saturn will have increased its brightness to +0.8 magnitude and now displays an 18 arc second diameter disk. It will now stand around 28 1/2 degrees high in the south at sunrise (from 51 degrees N), just a little off transit point.



Saturn and Inner Moons, just before sunrise, 30th June. Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

Uranus and Neptune

Uranus is a resident of Aries and re-emerging from May's recent Superior Conjunction and is not well-placed for early morning observations.   Neptune, a little further west in the Ecliptic, in Pisces, is better separated from the Sun, at around 86 degrees separation, but still will be a victim of a combination of height above the horizon and the lighter skies at night during this time of year. There are better conditions for observing the two outer giants of our solar system, but we'll have to wait until later in the year for them.



Relative positions of Uranus and Neptune, sunrise, 30th June. Image created with SkySafari 5 for Mac OS X, ©2010-2016 Simulation Curriculum Corp., skysafariastronomy.com.

Comets

The situation is a little on the quiet side comet-wise. The previously-covered Comet C/2022 E3 (ZTF), which gained much publicity at the end of last year and the beginning of this, is thought to be in outburst. As it is on its way out of the inner solar system, the maximum brightness this outburst is predicted to reach is 10th magnitude. This comet is the preserve of observers further south than 40 degrees N at present though.

C/2021 S3 (PANSTARRS) is looking like it may reach 5th/6th magnitude early next year and may be a nice binocular target and there is also C/2023 A3 to come, but this is still a considerable distance from the Sun and the comet has a long way to go before reaching the inner solar system. Further observations will determine if it is going to be a naked eye spectacle (which is looking less likely from recent brightness reports), or just a reasonable binocular target.

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 any clear night. The next shower to be on looking out for are the Southern Delta Aquariids in late July/early August.

Noctilucent Clouds

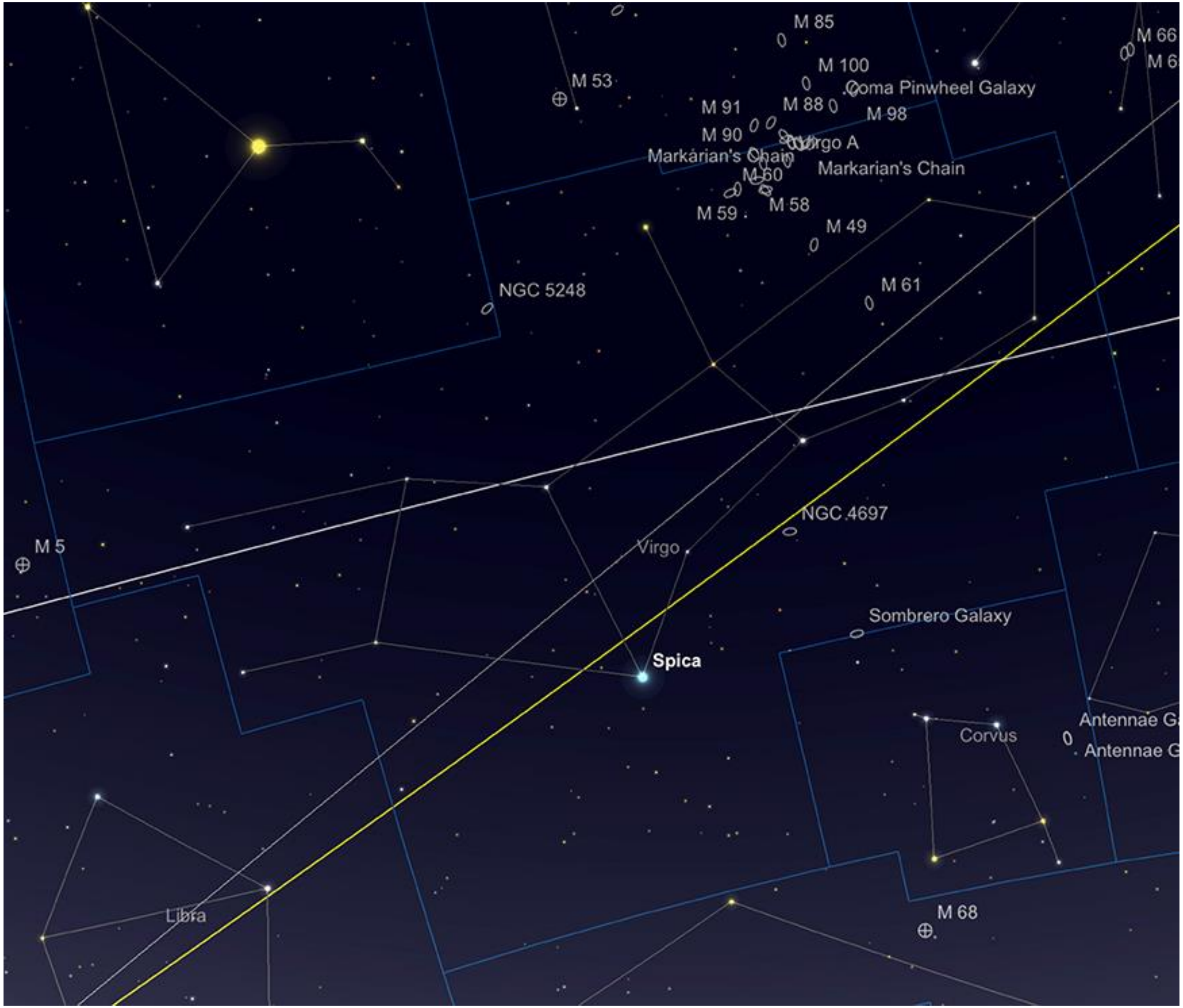
Noctilucent Clouds are often seen in June - their bright gossamer/web-like structures can normally be seen low on the northerly horizon, between latitudes of 50-65 degrees, when the Sun is between 6 and 16 degrees below the horizon. These clouds are mysterious - there were no recorded sightings of them 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.

Deep Sky Delights: Galaxy Season part 3, Virgo

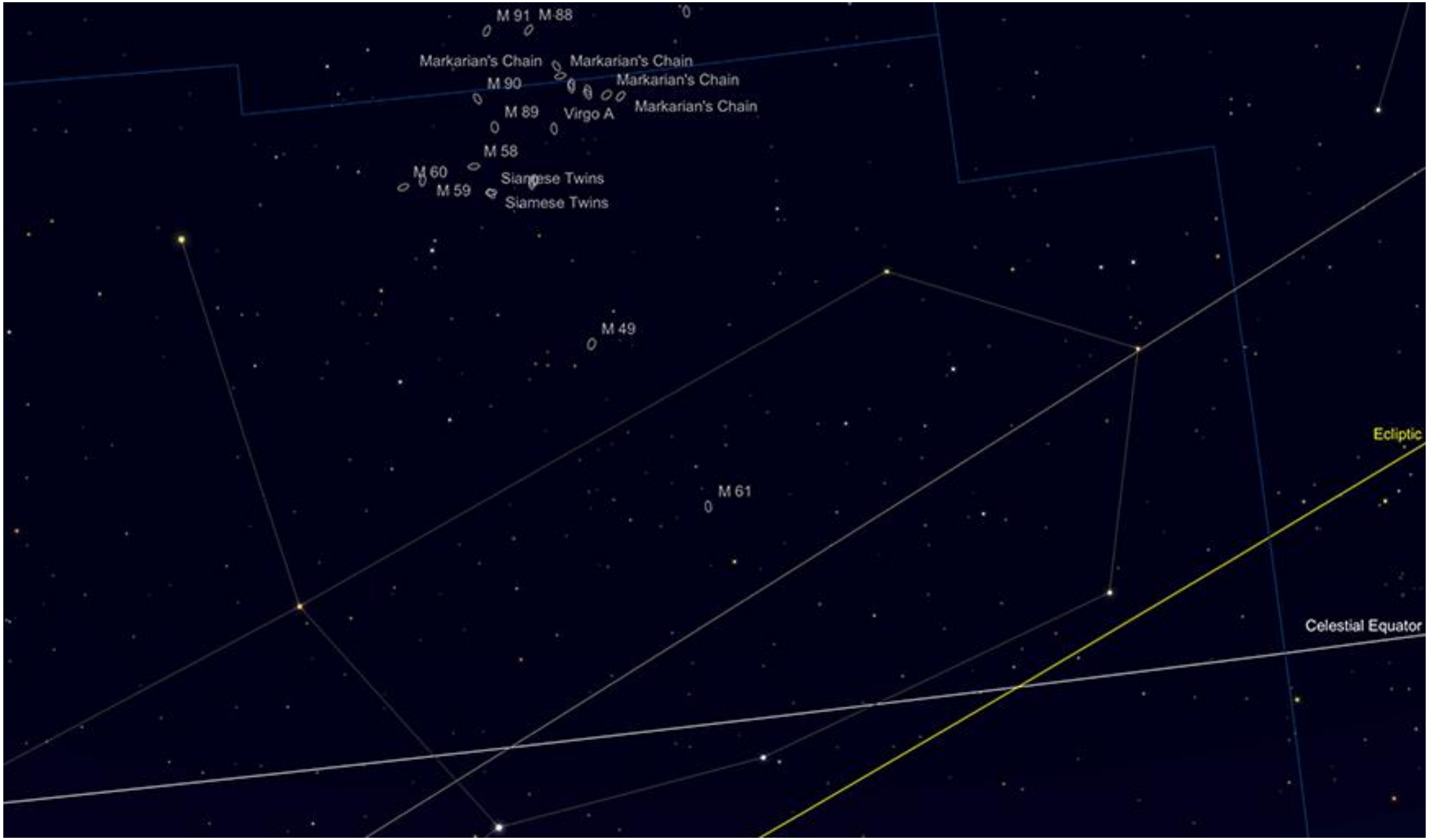
Picking up from where we left off Leo last month, we move south and east, over the border into the large and extremely galaxy-rich constellation of Virgo.



M 85
M 66
M 100
M 53
Coma Pinwheel Galaxy
M 91
M 88
M 98
M 90
Virgo A
Markarian's Chain
M 60
Markarian's Chain
M 59
M 58
M 49
NGC 5248
M 61
NGC 4697
M 5
Virgo
Sombrero Galaxy
Spica
Corvus
Libra
M 68

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

The so-called "Bowl of Virgo", which comprises of the most northerly section of the constellation is where the majority of the objects discussed below lie. So crammed in are these galaxies that it is difficult to see in the larger scale map above exactly where these mass of objects lie in relation to one another. The image below is a more detailed depiction of the "Bowl' area, which really gives an indication how crowded this area is.



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

The galaxies shown in the map above are just the brightest and easiest to observe in this area of sky. There are many more fainter galaxies lurking in the background, making up the Virgo cluster of galaxies. Indeed, it is thought that the interlinked Virgo Supercluster, which comprises of galaxies in neighbouring Leo, right the way through Ursa Major and our own local group of galaxies, is one of the largest structures in the known Universe.

Just under a degree SSW of M88, where we left off last month, lies the small +10.19 mag spiral galaxy of NGC 4477, which in turn marks the beginning of a glorious 1.5 degree long arc of galaxies known as Markarian's Chain. This gently curving line of galaxies is one of the finest sights in the sky and an almost peerless photographic subject from a galaxial point of view.

Markarian's Chain comprises of the aforementioned NGC 4477 at the Northerly end and the major galaxies M84 (elliptical, +9.10 mag), M86 (lentinicular, +8.89 mag), at its Southerly tip. Galaxies NGC 4473 (elliptical +10.19 mag), NGC 4461 (spiral +11.19 mag), NGC 4458 (elliptical +12.10 mag), NGC 4438 and NGC 4435 (both spiral, +10.80 mag, together known as "The Eyes"). The Chain spills over the Coma Berenices border into Virgo, where the largest part of it resides.

Markarian's Chain is named after the Armenian Astrophysicist Beniamin Markarian, who in the early 1960s first suggested a common motion for all these galaxies. Observations have proved than all the above galaxies are in fact gravitationally interacting with each other, though there are outlying and closer objects - most noticeably the spiral NGC 4388 which may, or may not, be a part of the system - which also populate the area.

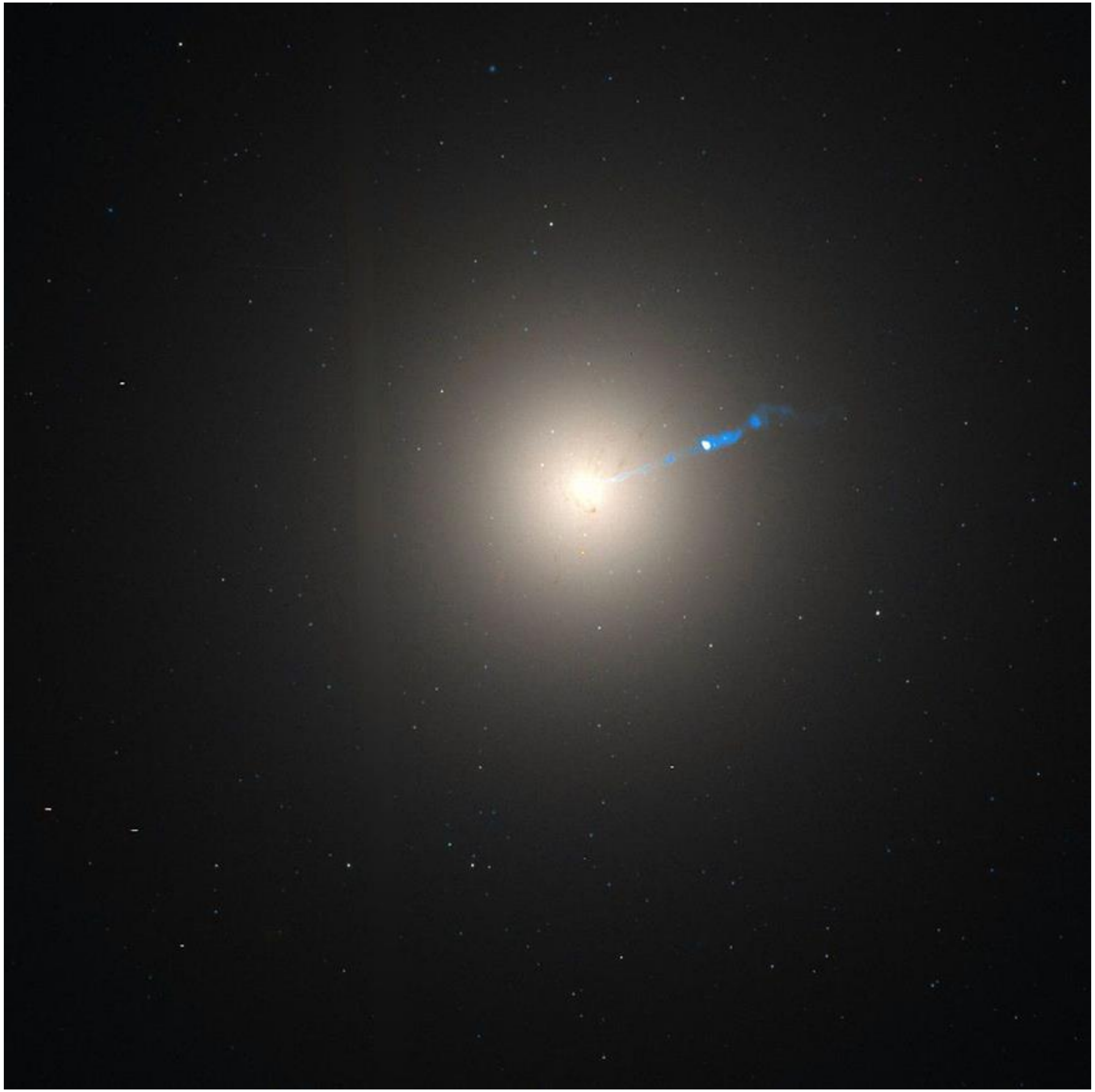

Markarian's Chain (Virgo Cluster)
M82, M84
NGC 4435, 4438 (Eye Galaxies)
By Mark Blundell
8th March 2016

Markarian's Chain by Mark Blundell. Image used with kind permission.

Frankly, it's difficult to pick out clear highlights in Markarian's Chain, but special mention must go to the eerily-named "The Eyes" galaxy pairing of NGC 4438 and NGC 4435. This pairing do appear like a pair of eyes peering back at an observer through the gloom and were first nicknamed this by late-19th and 20th century astronomer L.S. Copeland. Looking at these two objects in even a relatively small telescope will confirm this nickname's accuracy - the similar galaxial core brightness and angular orientation of both objects help to complete the illusion. Both galaxies it is clear have gone through some sort of interaction in the recent past as astrophotography reveals a large amount of stellar and dark material spilling from NGC 4438's disk.

A degree to the SE of the eyes lies the vast elliptical galaxy M87, otherwise known simply as Virgo A. This enormous object is easily picked up in amateur instruments from even fairly light polluted environments, shining as it does at +8.60 mag. M87 was discovered and catalogued by Messier in 1781.

To call M87 vast is to somewhat understate the case: it is estimated to be anything up to 200 times the mass of our own Milky Way galaxy and has over 12,000 globular clusters in orbit around it, compared to our galaxy's rather paltry estimated 150-200. M87 also appears to be close to the gravitational centre of the Virgo-Coma Supercluster and may be the key gravitational driver of the whole system. Astrophotography reveals a large jet emanating from M87's centre. This was first recorded by Lick Observatory Astronomer H.D. Curtis in 1918 and a corresponding much fainter opposite jet was discovered in 1966. These jets mark at their epicentre one of the most massive black holes so far postulated - a 2-3 billion solar mass object, condensed to about the volumetric size of our solar system. It is thought to be this object that makes Virgo A one of the most energetic sources of X-Rays, Radio Waves and Gamma Rays in the sky.



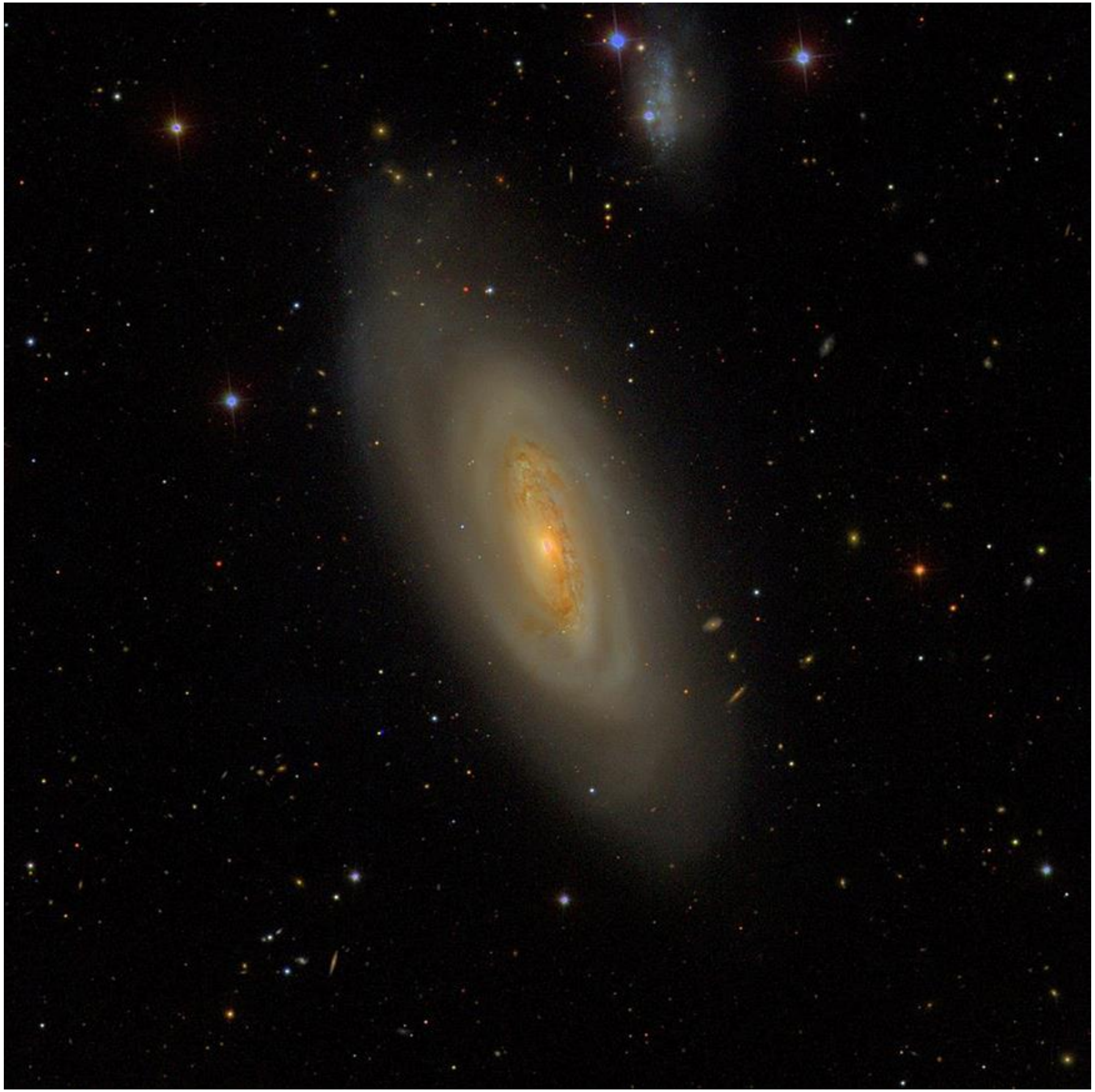
Virgo A, Hubble Space Telescope image, ESA/NASA. Public Domain.

This remarkable monster galaxy can be easily spotted in decent sized binoculars from a reasonable location and is one of the most straightforward galaxies to observe in the sky. To give a sense of scale, M87 lies 55 million light years away and its outer extents observable from here on Earth cover an area of sky larger than the full Moon. If put in place of M31, the Andromeda Spiral, in our skies, M87 would probably fit into an area the size of the Square of Pegasus - it's that big! However, even the mighty M87 pales in comparison to the galaxy IC1011 (also in Virgo) which takes the prize of the largest galaxy currently known at a staggering 6 million light years across - 60 times the size of our Milky Way's 100,000 light year span.

Just over a degree E of M87 lies another elliptical galaxy: M89. This Messier-discovered object is fairly bright and compact at +9.80 mag and 3.5 x 3.5 arc minutes in size. M89 is a remarkably spherical object, or at least appears to be from our perspective. This is unusual, as most elliptical galaxies do appear slightly elongated. M89 is rather special in terms of its conformity. This makes for an easily observed object in most telescopes, but unfortunately, a rather bland experience.

M89, Hubble Space Telescope image, Hubble/ESA. Creative Commons.

Whereas the unfortunate M89 is fairly bland, its neighbour, M90, to be found 3/4 of a degree to the N is anything but. At +9.50 mag and an angular size of 9.5 x 4.4 arc minutes, it is a touch difficult in binoculars in comparison with its two elliptical neighbour, but is well-seen as a elongated spiral in larger telescopes. M90 is fairly unique amongst Messier galaxies, as its spectral shift is very pronounced towards the blue side of the spectrum, suggesting it is rapidly approaching us in relation to the rest of the cluster. This may be due to it having broken free of the gravitational bounds of the cluster, or indeed it may be considerably closer than the 50-or-so million light years distance it is thought to lie. Another interesting feature of M90 is that star formation appears to have ceased almost entirely within the system. As such it is referred to as a "Fossil Galaxy". M90's swift flight through the interstellar medium is thought to have stripped it of much of its star forming material via the process known as "Ram Pressure Stripping". This appears to also have been compounded by several supernovae in its central arm regions, which would naturally be richer in this material. The combined stellar winds from these events have blown much of the material out of the galactic disk and out of the gravitational influence of the galaxy.



M90. Image credit: Sloan Digital Sky Survey [www.ssds.org] Creative Commons.

One and 1/3 degrees S of M90 lies another spiral galaxy, M58. Although M58 is a little fainter than M90, at +9.69 mag, it appears, due to its compact size - 6.0 x 4.8 arc minutes - a little brighter overall. M90 is a barred spiral, though due to the relative brightness of its spiral arms, the bar appears a little obscure, particularly in smaller telescopes - though these will show its disk shape well. Larger instruments will start to resolve the mottled internal structure and arms better, with the central bar becoming more obvious in instruments of the 8-10-inch class. M58, alongside M90 is a relatively poor galaxy for star formation and seems to be a victim of the dreaded Ram Pressure Stripping as well. Lying some 62-68 million light years away (sources differ) it is suggested that at the time of its discovery by Messier in 1779, it was the furthest observed object in the Universe.

M58 taken with the 0.8m Shulman Telescope. Image credit: Adam Block/Mount Lemmon SkyCenter/University of Arizona - http://www.caelumobservatory.com/gallery/m58.shtml. Creative Commons.

Just over a degree to the E of M58 lie the first of two elliptical galaxies, M59 and M60 (a little under half a degree further E). These two galaxies were first discovered by Johann Gottfried Koehler in April 1779, Messier listing them shortly after. Both men were principally concerned with comet watching rather than any notion of "Deep Sky" objects - ironically their discoveries of these pesky objects getting in the way of "true" comets would ultimately be of much greater cosmic significance.

Of the two galaxies, M60 is dominant, being +8.8 mag to M59's +9.6 and slightly larger at 7.6 x 6.2 to M59's 5.4 x 3.7 arc minute size. Still, M59 in a large telescope is a fine object, displaying a bright outer halo, though M60 trumps it in imaging terms, which reveal a closely packed spiral companion galaxy, NGC 4647, at +11.30 mag, to its NW, overlapping the larger elliptical's outer regions. It is possible to see this attendant galaxy with large telescopes (12-inch+) from a dark site, but it will be difficult with anything smaller. It is debated whether or not NGC 4647 is truly interacting with M60, as evidence, bar the obvious visual closeness has been scant. However, latest observation by the Hubble Space Telescope suggest that interaction is possibly at the beginning stages and the two objects are not simply line of sight co-incidental.

M60, NGC4647 Galaxy's
© 2021 Mark L Blundell

M59 (top) and M60 (middle) by Mark Blundell. Image used with kind permission.

Both M59 and M60 are thought to contain supermassive black holes in the order of mass equal or larger than the mass of M87's - with M60's thought to be a huge 4.5 billion solar masses.

If we trace a line back West from M60, to M 59, then back to M58, we have a starting point for the identification of the next target for this month, the Siamese Twins Galaxy or Butterfly Galaxy. This is in fact two objects, NGCs 4567 and 4568, which can be found just over half a degree to the SSW of M58. These objects are +11.30 and +10.80 mag respectively and can be resolved as a V-shaped patch of light in smaller telescopes. Larger (8-10-inch class) instruments will clearly resolve the objects as a much more rounded "V" - very reminiscent of a butterfly in flight, in fact. Larger instruments under good conditions will start to resolve some variance of brightness within the disks, but it is in astrophotography that this target really begins to show its true awesome beauty. Images reveal the early onset of a collision between these two spiral galaxies, which has been confirmed by professional infrared observations.


Göran Nilsson &
The Liverpool Telescope

NGC4567 and NGC4568. Image credit: Goran Nilsson & The Liverpool Telescope. Creative Commons.

Following a line from M58, through the Siamese Twins, extending SSW by just over 3 and 1/2 degrees, we come to the penultimate object for discussion this month, the bright elliptical galaxy M49. M49 was discovered by Messier on 19th February 1771 and was the first of the Virgo group to be added to his list of objects. At +8.39 mag and 10.2 x 8.3 arc minutes dimensions, this galaxy is large, but still pretty bright - certainly conspicuous enough in binoculars under average conditions. Indeed, M49 is the brightest of all the Virgo cluster, though M87 does give it a run for its money. It was thought that both objects were of similar size and mass, but observations have now proved than M87 is by far the larger and heavier of the two galaxies. By comparison, M49 has "only" 6000+ globular clusters to M87's 12000+.

4 degrees to the SSW of M49, extending the imaginary line we stared from M58, we come to the final objects in this month's epic tour of just some of Virgo's Deep Sky delights. This object is one of the most beautiful and the most active, M61.

M61 was discovered by Barnabus Oriani on 5th May 1779 and was also noted on the same night by Messier, who classed it as a possible comet. Less than a week later, Messier had realised that M61 was a static object, so then added it to his list.

At +9.69 mag and 6.5 x 5.9 arc minutes, M61 is a fairly compact galaxy, having a bright star-like core, surrounded by evidence a its face on spiral nature, which is visible in smaller telescopes as a tenuous halo, but is resolved much more readily and successfully by the 12-inch+ class of telescope into a definitive spiral. In fact, M61 is another barred spiral, but this bar is very compact in comparison to virtually every other barred spiral galaxy previously mentioned here. Again, M61 is a worthy target for astrophotographers, who will pick up this compact spiral's structure well in long duration photographs.

M61 is unusual in being one of the most active star-forming galaxies in the Virgo cluster.Likewise it holds the joint record with M83 as being the most active Messier object for Supernovae, with six being observed in the the past century.

M61. Image credit: ESO/VLT. Creative Commons.

From M61, we can trace a curving arc to the SE in the direction of Spica, Virgo's principle star, which takes in a few of Virgo's lesser galaxies, the elliptical +9.50 NGC4636 is exactly 5.5 degrees SE of M61, followed by the +10 mag spiral NGC4753, then reaching NGC4697, which is a brighter elliptical galaxy, discovered by William Herschel in 1784. This galaxy is fairly easy in small telescopes, as is its neighbour NGC4699, an attractive but compact spiral, which lies just under 3 degrees due South.

At the bottom of this arc, 3 and 3/4 degrees to the SW of NGC4699, lies one of the jewels of the night time sky, M104, the Sombrero Galaxy. The Sombrero was discovered in 1767 by Pierre Machain and though noted by Messier in an addendum to his original list, had to wait until Camille Flammarion rediscovered it in Messier's original notes in the early 1920s for it to be officially added as a Messier object. William Herschel made an independent discovery of it in 1784 and remarked upon the appearance of a "dark stratum" in the object. We now know this to be a prominent dust lane which rings the outer spiral structure of the Sombrero and gives it its distinctive - and apt - nickname.

The Sombrero is bright for a galaxy at + 8 mag and a decent size, (though hardly over-large) at 8.6 x 4.2 arc minutes in dimensions. It can be found in telescopes and binoculars of all sizes, though contrary to what is stated in many publications (which tend to overstate the size of telescope required), a good quality 4-inch refractor and a dark observing site and decent dark adaption will be needed to see its dust lane. Admittedly, the lane is much easier with a reflector of 8-10 inches in aperture, which will also resolve the true shape of the Sombrero better, but this should not put off observer with smaller instruments from attempting to spot it. Once found, M104 will not be forgotten in a hurry, it is a lovely object. M104 is even more spectacular when imaged, though from UK locations astrophotography of this target has to be timed carefully, as it is only at a reasonable height from the horizon for a limited period.