

Earth reaches perihelion [ its closest distance to the Sun ] on Jan 2<sup>nd</sup> at a distance of 147,093,163 km .

The January night sky now sees some familiar winter constellations rising by early evening, the winter night sky contains many fine objects to view with both binocular and small telescopes. Just half an hour **after sunset** a trio of planets Mercury , Saturn and Jupiter may be seen low in the SW aspect around Jan 9<sup>th</sup> and Jan 10<sup>th</sup> , The evening trio is joined by a thin waxing Crescent Moon on Jan 14<sup>th</sup> , visible half an hour **after sunset** . Mercury reaches max elongation on Jan 24<sup>th</sup>. Saturn and Jupiter rapidly head into the daytime sky from mid month and Conjunction on Jan 24<sup>th</sup> and Jan 29<sup>th</sup> respectively, so catch these early January. Mars shines brightly and unmistakably orange in colour in evening twilight in conjunction with planet Uranus, separation 1.7° on Jan 22<sup>nd</sup> in the constellation of Aries. Planet Neptune in the constellation of Aquarius is the only other binocular /telescopic planet visible in the early evening skies. Venus shines brightly very low the east in dawn twilight and is joined by a thin waning Crescent Moon on Jan 11<sup>th</sup>.

The constellations of Cygnus and Lyra can be seen slipping into the west early evening; these are noted for the bright stars of Deneb and Vega which appear low in the north by late evening , both stars are circumpolar , i.e. are above the horizon from UK latitude .

The Milky Way stretches from the constellation of Auriga , marked by the bright star Capella in the east up into Perseus and through the `W` shaped constellation of Cassiopeia high overhead and down along the cross shaped constellation of Cygnus low in the west . This faint band of stars best seen on dark moonless evenings .

Auriga has the bright star Capella, which is circumpolar from UK latitudes and so is always visible. Telescopic comet C/2020 M3 ATLAS passes close to Capella on Jan 2<sup>nd</sup>, the comet is a faint `fuzzy` , magnitude 10m [fading] , its coma is low surface brightness and merges into the lighter skies of the town , so will be best seen on moonless evenings mid month , away from artificial lights at darker sky sites (See notes and LAS Newsletter No 258A ) The constellation of Auriga contains some nice star fields and star clusters M36 , M37 and M38 all visible in binoculars.

In the south west the constellation of Pegasus, noted for its `Square` shape and the adjacent constellation of Andromeda noted for The Andromeda Galaxy (M31) , visible to the unaided eye as a faint fuzzy patch on moonless evening can now be seen mid evening . The Square of Pegasus is a useful sign post constellation and also is a good test for sky conditions, (how many faint stars you see within the square indicates just how good your seeing conditions are). Follow the two end stars (Scheat and Markab) down to find the constellation of Aquarius and the Planet Neptune (see notes)

In the north Ursa Major, The Plough or The Great Bear is seen low with its handle or tail tipped down towards the horizon mid evening. Use the right hand pair of stars Dubhe and Merak (The pointers) to find the faint pole star Polaris and hence the position of North.

Look to the east early evening to see the seven sisters' (Pleiades, M45) star cluster and constellation Taurus .The Hyades star cluster makes the characteristic `V` shaped asterism in the constellation of Taurus and is noted for the bright, red foreground star Aldebaren in Arabic Al Dabaran is `The follower` of the Pleiades across the skies , in old English known as *Oculus Tauri*, `the eye of the bull`. Also in Taurus is the famous `Crab Nebula` M1, the first object catalogued by French astronomer Charles Messier, it is a remnant from a supernova explosion witnessed by Chinese observers in AD1054. Telescopically it looks like a grey oval shaped nebula, but larger instruments show some detail ie extensions that give it its name, looking like the claw of a crab. At the centre of the Crab Nebula is a rapidly rotating pulsar star, the remains of the supernova, surrounded by the expanding shell of gas that is the Crab Nebula. The use of a light pollution reduction filter (LPR) improves the contrast for town observers.

By mid evening the familiar winter constellations of Orion (The Hunter) is rising with bright red star Betelgeuse (top left) , white star Rigel (bottom right ) and the three stars of Orion's belt Mintaka , Alnilam and Alnitak . Below Orion's belt can be seen the misty patch that is M42 / M43, visible to the unaided eye, it is one of the gem's of the winter skies when seen with a telescope. This nebula some 30 light years across is illuminated by a group of four hot young stars that is known as the `Trapezium `asterism, visible under moderate magnification.

The Quadrantids meteor shower reaches maxima January 4<sup>th</sup>, however this year maxima is coincident with the bright skies around Full Moon ( Dec 30<sup>th</sup> ) so its unfavourable for seeing these blue/ yellow meteors on evenings over the period January 1<sup>st</sup> to January 6<sup>th</sup>.

Periodic comets 141P Machholz 9.7m [ LAS Newsletter No 277 ] and 156P Russell –LINEAR 10m [LAS Newsletter No 270A] are both telescopic / imaging objects moving night to night through the constellation of Aquarius and Triangulum respectively (see notes) . Comet 156P Russell-LINEAR is located near to M33 in Triangulum on Jan 7<sup>th</sup>; both are extended low surface brightness objects – difficult observed visually from the town and in moonlight but favour imaging techniques.

Three Asteroids reach opposition in January 2021 all located in the elusive constellation of Cancer [The Crab] , Asteroid No 14 Irene is the brighter object but at magnitude 9.7 requires larger binocular / telescopic observation. The Constellation also contains M44 the Beehive cluster, a useful signpost in tracking down the asteroids. Details for Irene (14) [ LAS Newsletter No 276 ] , asteroid Eunomia (15) [ LAS Newsletter No 273 ] and asteroid Hygiea (10) [ LAS Newsletter 275 ] are available to LAS members.

Lunar observers may like to note that the moons libration [ slow rocking /tilting of the Moon] favours a glimpse of the elusive Mare Humboltianum on the NE Limb (Jan16<sup>th</sup>) and some Clair Obscure effects [ Details Sky at Night magazine -January 2021 edition ]

## Planets in January 2021

Mercury returns to evening twilight early January reaching maximum elongation Jan 24<sup>th</sup>

Venus located in the dawn twilight low in the east, brilliant -3.9m and phase increasing to 97% by month end.

Earth reaches perihelion, its closest point in its orbit to the Sun on January 2<sup>nd</sup> distance 147,093,163 km.

Mars is visible all evening, located in Aries well placed in the south, apparent diameter reducing to just 8.3 “

Jupiter slips sunward by month end, it is low in evening twilight with Saturn and Mercury (Jan 9<sup>th</sup> to Jan 14<sup>th</sup>).

Saturn is seen low in evening twilight early January before reaching conjunction on Jan 24<sup>th</sup>.

Uranus is visible all evening in Aries (Binoculars required) located just 1.7° south of Mars (Jan 22<sup>nd</sup>) see notes

Neptune is located in Aquarius low in early evening twilight, sets by 21:00 hrs late January.

## Moons phases in January 2021

New Moon      Jan 13<sup>th</sup>      Moonless, best time for deep sky observing.

First Quarter    Jan 20<sup>th</sup>      Best days to see shadow details in lunar craters (early evening)

Full Moon      Jan 28<sup>th</sup>      Best days to see bright ray craters like Copernicus / Tycho.

Last Quarter    Jan 6<sup>th</sup>      Moon visible in daytime skies. Do not look directly at the Sun.

## Meteor shower s

Quadrantids range Jan 1<sup>st</sup> to Jan 6<sup>th</sup>, Max Jan 4<sup>th</sup> ZHR 80 / hour – Unfavourable – moonlight interferes

## The highlights of the month.

Milky Way is visible high overhead on moonless evenings in darker skies.

M31 the Andromeda Galaxy is visible on moonless evenings, best seen in binoculars.

Double cluster, on the Perseus /Cassiopeia border, nice pair of star clusters.

Pleiades (Seven Sister's) star cluster (M45) rising in the east best seen with binoculars.

Orion Nebula (M42) is a beautiful sight seen telescopically.

Beehive cluster (M44) visible to the unaided eye but best seen with binoculars.

Crescent Moon visibility, Jan 14<sup>th</sup> 2.77% thin crescent **Moon sets 17:40 GMT an hour of sunset.**

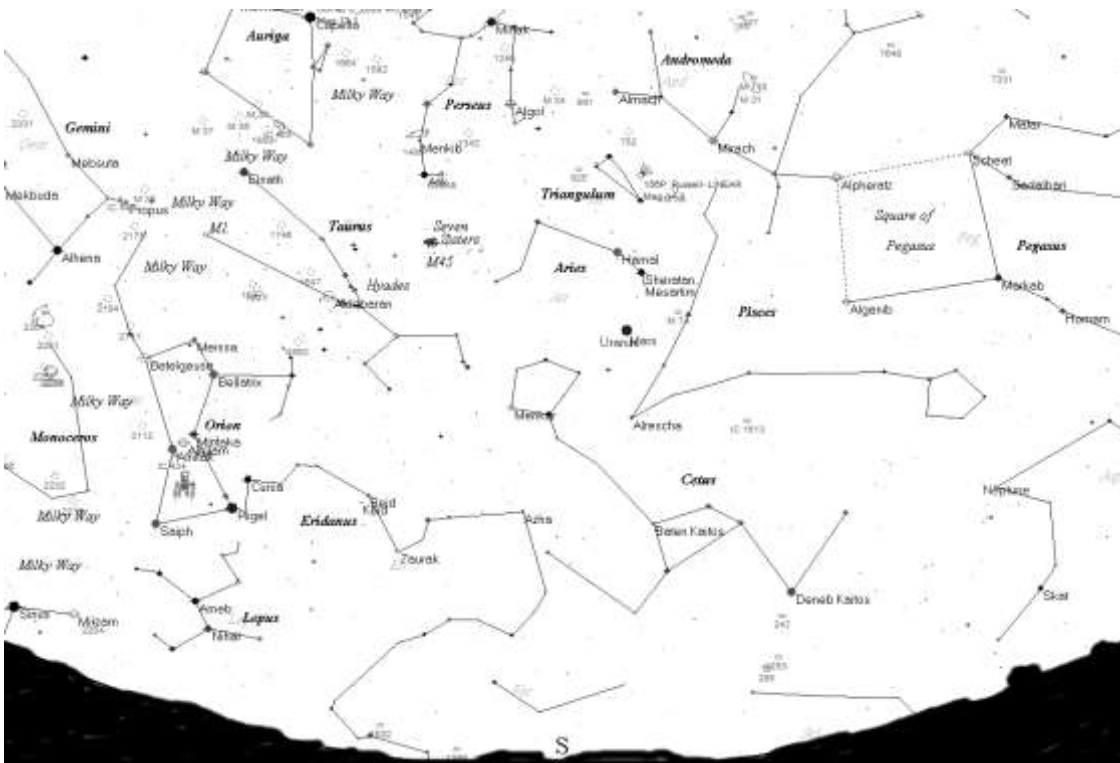
**(Caution, always wait until the sun has completely set below the horizon before looking for crescent Moon)**

Jan 14<sup>th</sup> a waxing crescent moon joins the trio of planets Mercury, Saturn and Jupiter 30 min after sunset.

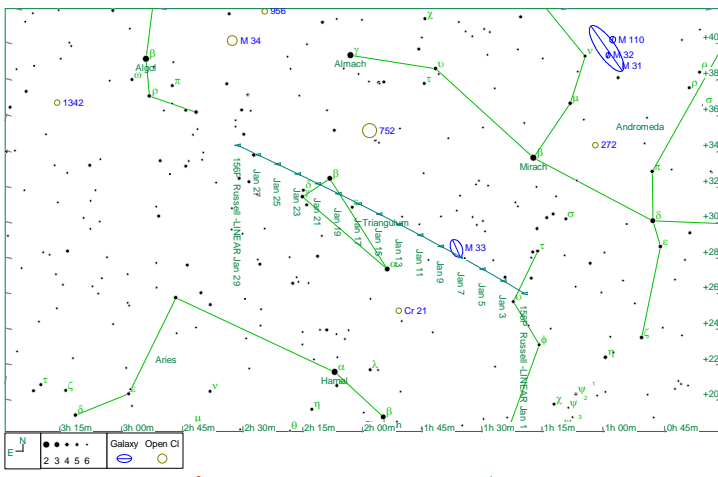
Comet C/2020 M3 ATLAS positioned in Auriga close to Capella (larger Telescopes / Imaging)

More detailed sky notes and LAS Newsletters, Finder charts are available to LAS members via the Members` page please refer to LAS Website [www.lutonastrolink.org.uk](http://www.lutonastrolink.org.uk)

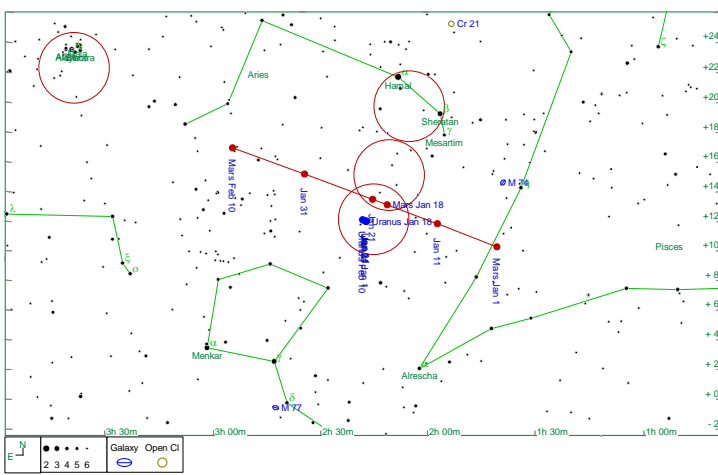
Sky looking south 8 pm\_mid January 2021



Mars and Uranus due south mid evening. Orion, Taurus with the Hyades and Seven Sisters star clusters are easy spots.

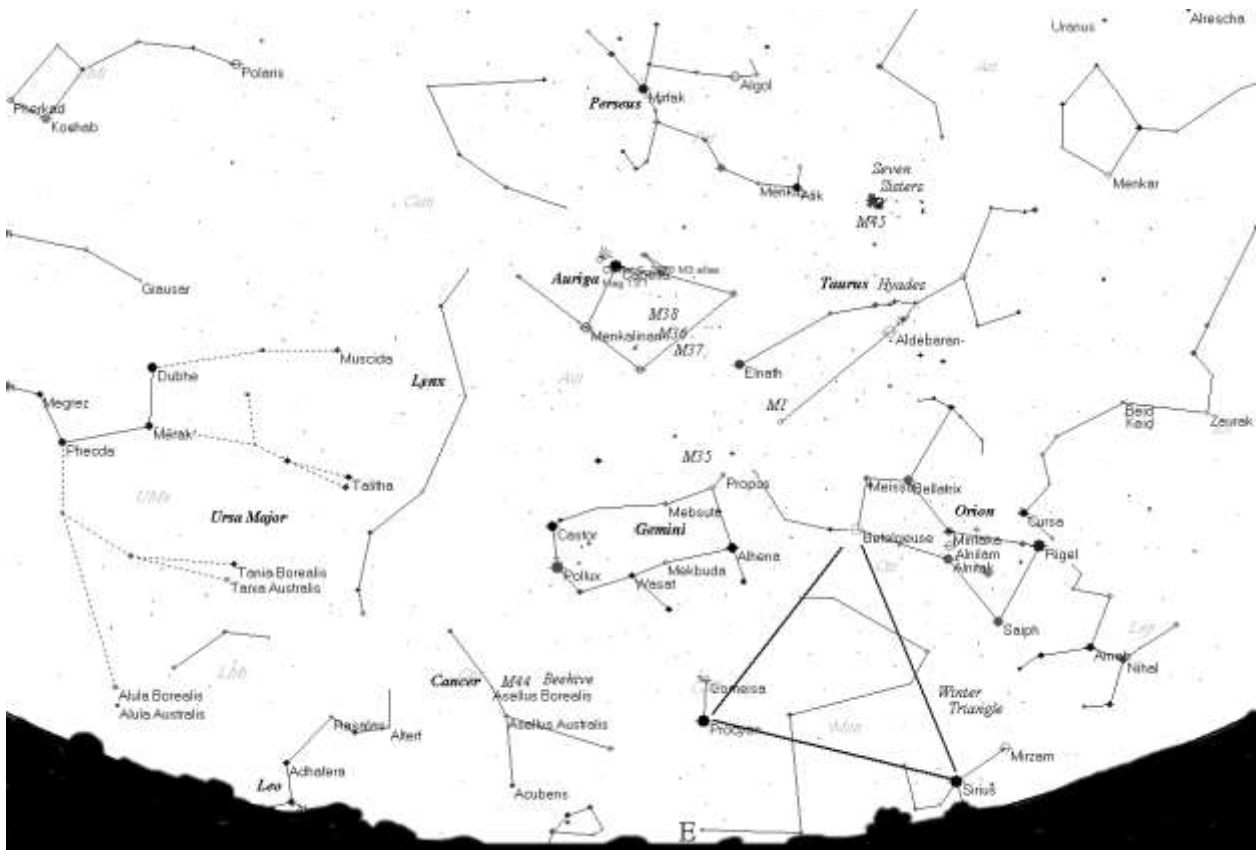


Comet 156P Russell-LINEAR passes close to M33 (Pinwheel Galaxy) in Triangulum - Imaging opportunity Jan 7<sup>th</sup>.



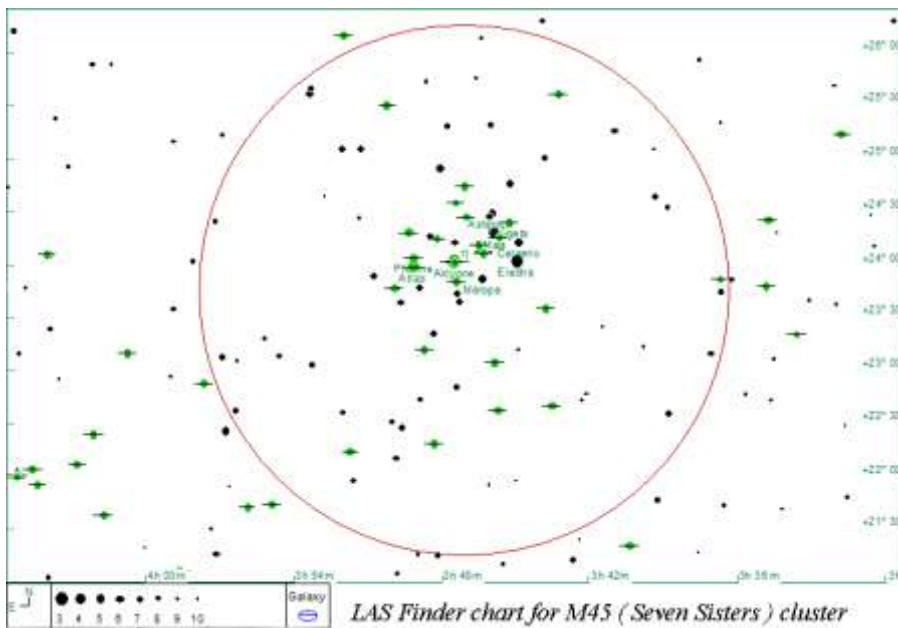
Mars and Uranus in the same binocular field of view in 10x50 binoculars -late January . Separation 1.7° Jan 22<sup>nd</sup>

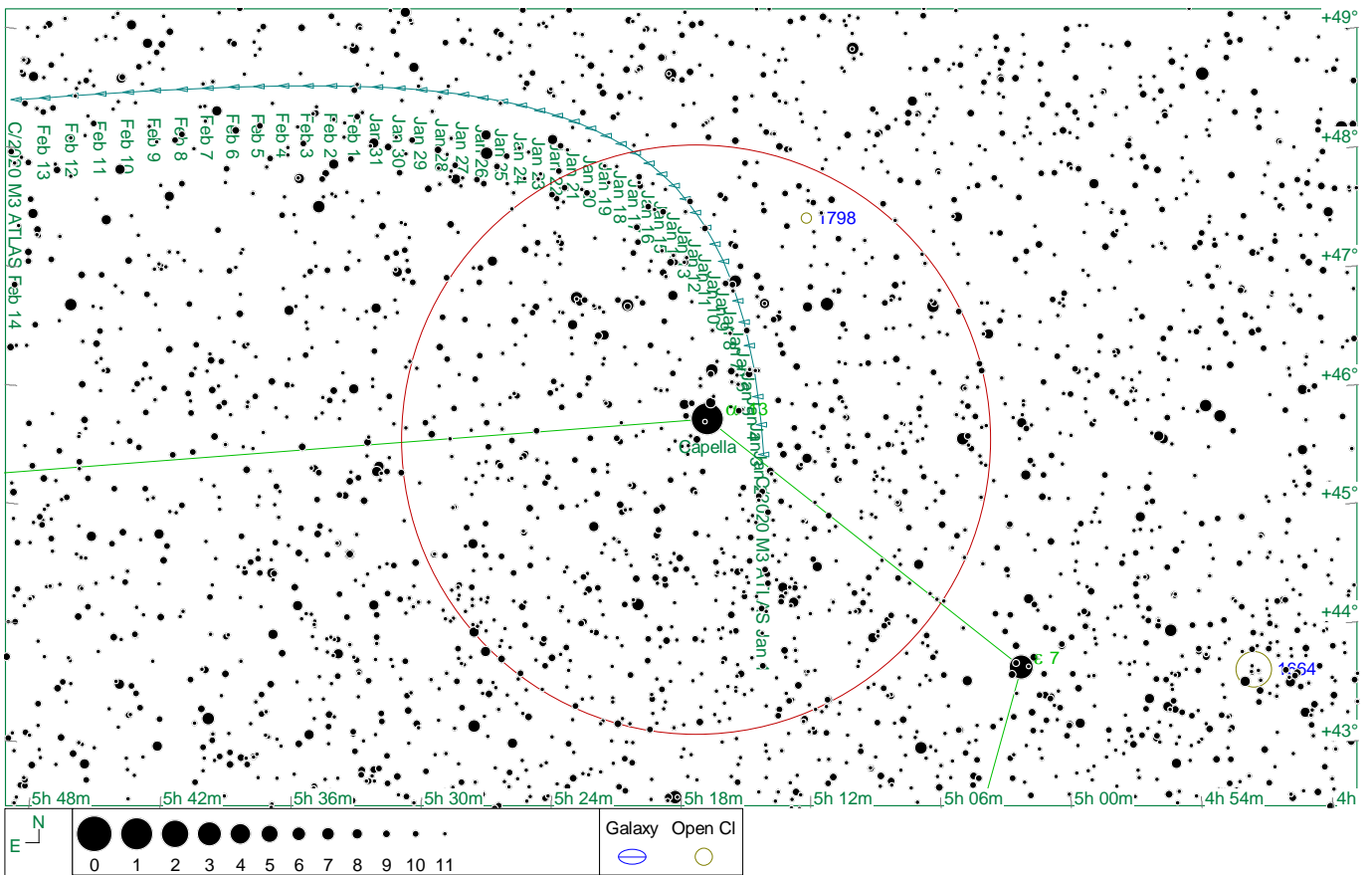
Sky looking east at 8pm mid January 2021



The constellations of Taurus, Auriga, Gemini and Orion can be seen rising early evening in January. The three stars Sirius, Procyon and Betelgeuse form the Winter Triangle asterism.

The Seven Sister's cluster (M45, Pleiades) is an easily identified star cluster. Some people with keen eyesight may see up to 13 stars (how many stars can you see with unaided eye?), but a telescope will show over 400 faint stars in the cluster. Circle represents the approximate field of View (FOV) of a 10x 50 binocular / Finderscope.

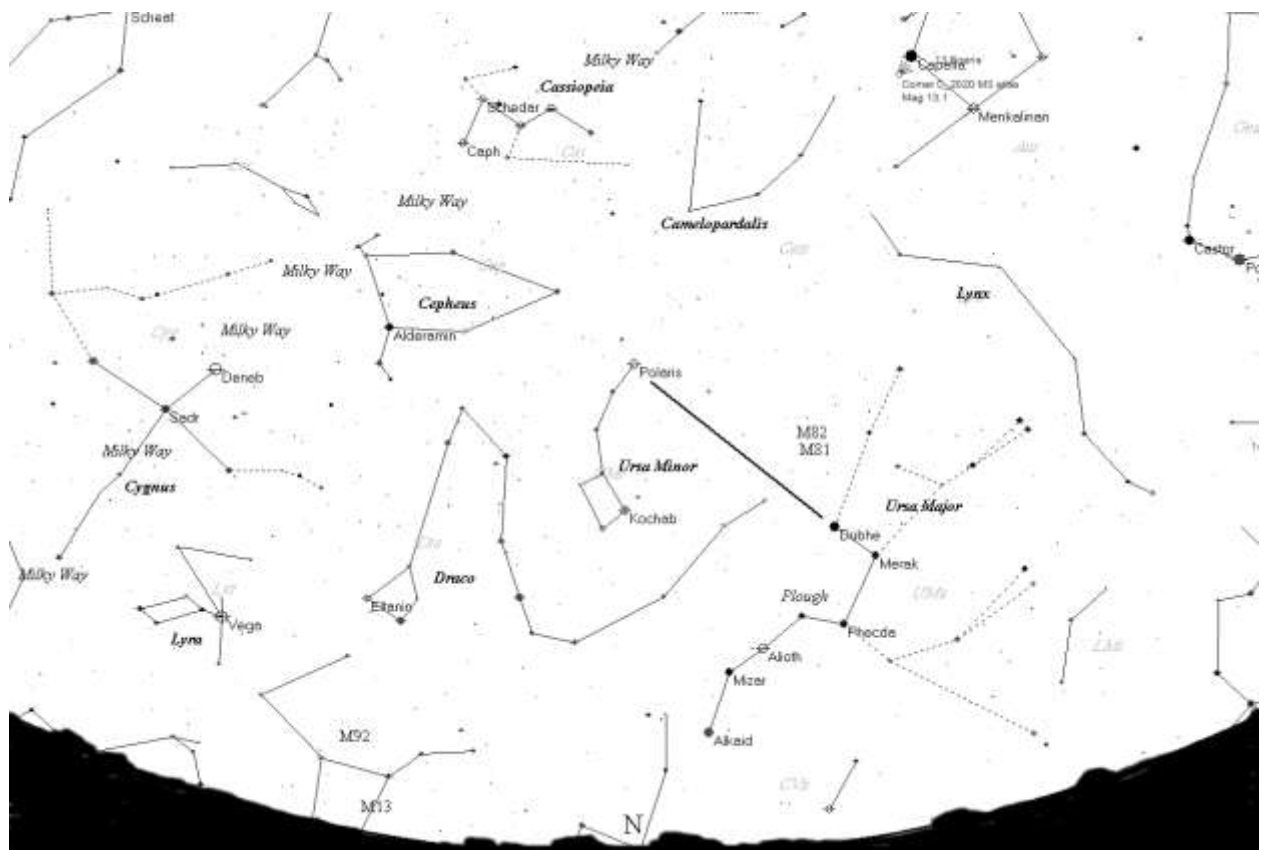




LAS Finder chart for C/2020 M3 ATLAS located close to the star Capella in Auriga early / mid January 2021

Circle = Field of view of 10x50 finderscope – stars shown to limiting magnitude 11.0 - The comet however is a faint low surface brightness fuzzy coma around 6 arc min diameter that may be best detected by imaging techniques from darker sites in moonless conditions.

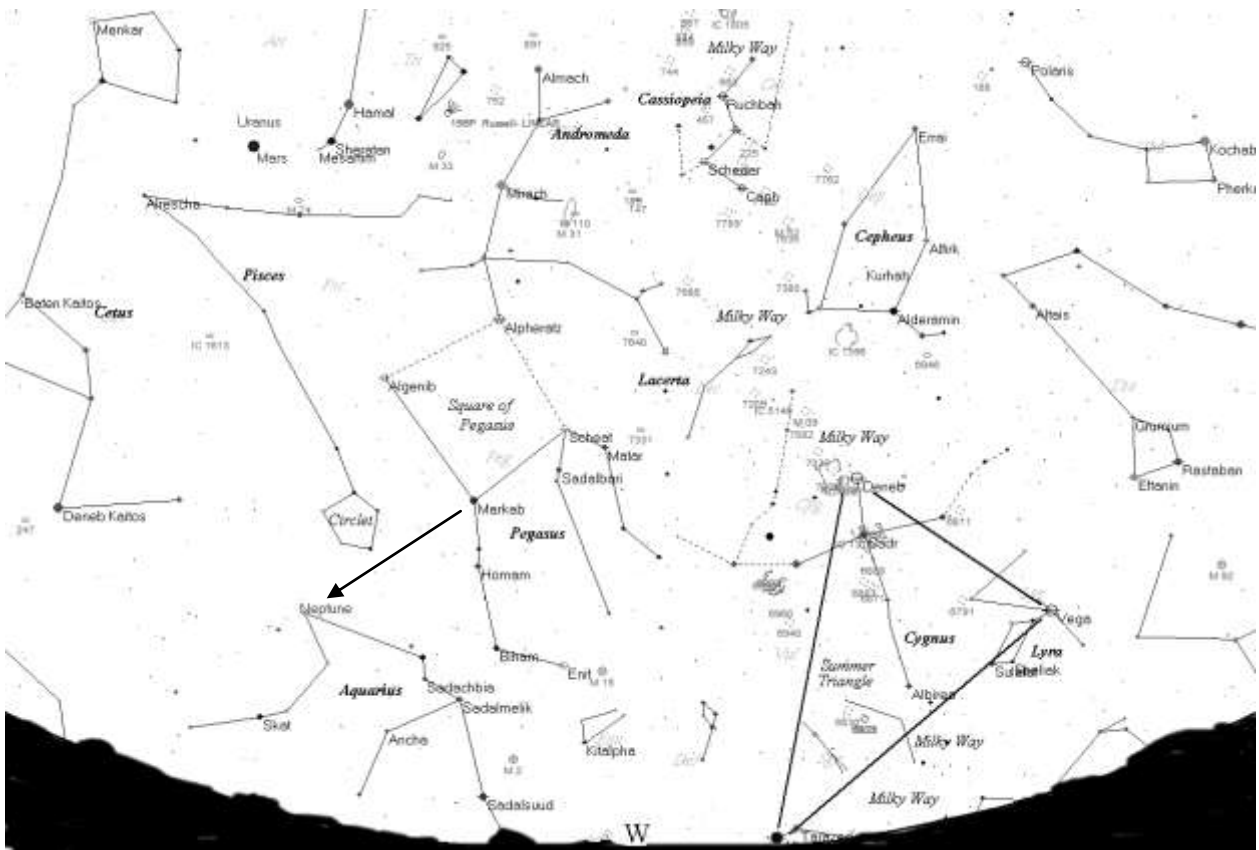
Sky looking north at 8pm mid January 2021



The Plough stands on its handle follow the pointer's Dubhe and Merak to find the polestar Polaris

The `W` shaped constellation of Cassiopeia looks more like a `M` and is on the opposite side of the polestar to the Plough.

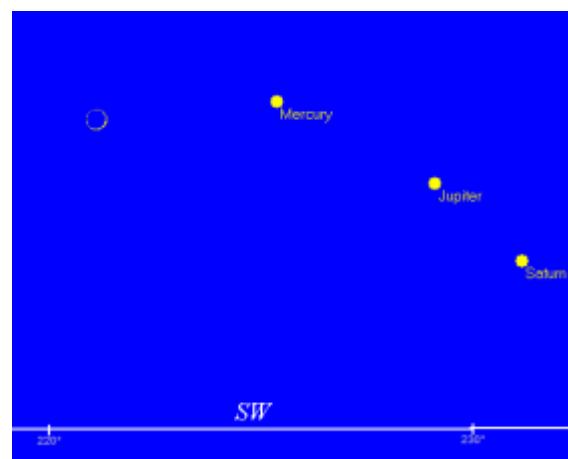
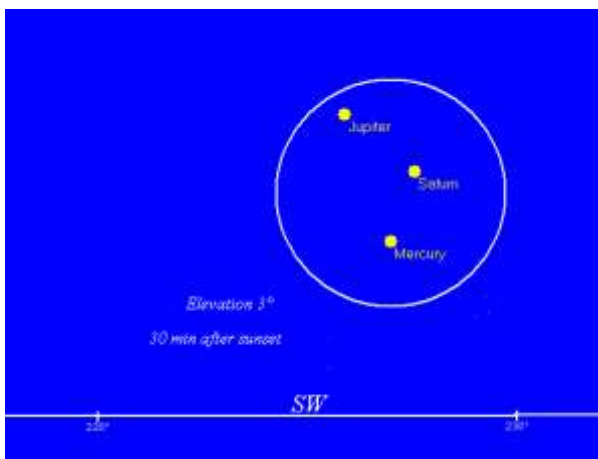
Sky looking west at 8 pm mid January 2021



Stars of summer and Autumn slip towards evening twilight, Aquarius and Neptune are seen early evening

Milky Way stretches up from the NW horizon, through Cygnus and Cassiopeia, visible to the unaided eye from dark sites on moonless evenings and a great sight seen with binoculars

Looking west 30 minutes **after sunset** , the trio of planets Mercury , Saturn and Jupiter



On Jan 9<sup>th</sup> / 10<sup>th</sup> all three are visible in a binocular field of view , Jan 14<sup>th</sup> the thin Crescent Moon joins too