

The September night sky perhaps offers some of the best observing conditions. With the autumn equinox for northern hemisphere observers on September 22<sup>nd</sup> the mix of summer and autumn contains many fine objects to view with both binocular and small telescopes. In our early evening skies the planet Venus shines brightly very low in the west setting just an hour after sunset. Mercury reaches greatest elongation (E) on September 14<sup>th</sup> but like Mars both planets are poorly placed not observable for UK observers, both setting within 20 minutes of the Sun.

By mid evening look to the southeast aspect to find the ringed planet Saturn look for a yellowish coloured star low in the constellation of Capricornus. Binocular or your 10x50 finder scope will show Saturn look `odd` compared with the other field stars, its elongated shape is of course due to the ring system. Look with a small telescope at around x100 magnification to see the rings and the brightest of Saturn's moon Titan. To the east of Saturn find the bright planet Jupiter, binoculars or your 10x50 finderscope show a definite disk and up to four bright Galilean moons. Small telescopes show the main equatorial cloud belts and the polar region belts, moderate or larger telescopes show the additional temperate cloud belts and when visible the pale straw coloured `Great Red Spot` - . Also visible in moderate telescopes the tiny dark spot(s) of the Galilean moon shadows cast onto the clouds - Timings for GRS transit and convenient shadow transit(s) are given in LAS Newsletter No 229A. September is a good time to look at these two planets in the mid to late evening, although good views can be had in early evening twilight in late September / October when the contrast between the bright planet and the background sky is less.

The other two planets on view from mid evening are Uranus and Neptune. Neptune reaches opposition on September 14<sup>th</sup> and is located just to the east of Jupiter in the constellation of Aquarius. It is visible as a `tiny` blue coloured dot compared with the pin sharp points of the surrounding field stars. [LAS finder chart for Neptune -LAS newsletter No 302}. Asteroid (2) Pallas at opposition Sep 11<sup>th</sup> [LAS newsletter No 306] By late evening the constellation of Aries is rising and so the last of the planets visible in September evening skies Uranus is now visible in binoculars or small telescope.

Uranus is located almost level with the easily recognised `Seven Sisters` M45 star cluster and 2½ finder / binocular fields below the star Hamel ( $\alpha$  Arietis). At 5.7m magnitude Uranus is just visible to the unaided eye from a dark moonless site, but binoculars or 10 x50 finderscope show it well. Look for the characteristic green dot compared with the fainter pin sharp field stars – as there are no green stars you can identify Uranus relatively easily.

The constellations of Cygnus, Lyra and Aquila can be seen high overhead and into the south; these are noted for the bright stars of Deneb, Vega and Altair respectively forming the `Summer Triangle` asterism. The Milky Way stretches from Perseus rising in the north east, through the `W` shaped constellation of Cassiopeia in the north east, along the cross shaped constellation of Cygnus. This faint band of stars best seen on moonless evenings from a dark site continues down through the obscure constellation of Scutum and on in the direction of the centre of the Milky Way (not visible from the UK) low on the horizon.

Look early evening low in the south/ southwest aspect towards the constellations of Sagittarius. To the west of the `spout` of the Teapot Asterism the star fields of the Milky Way rise upward (best seen with binoculars). There are many fine star clusters and other deep sky objects in this area of sky.

The faint band of light of the Milky Way is seen stretching high overhead and low into the south. Use binoculars to reveal the rich star clouds that show a myriad of stars and some of the dark rifts, regions of the Milky Way spiral arm obscured by dust clouds on clear moonless evenings. Auriga has the bright star Capella and can be seen low in the north east early evening, Capella is circumpolar from UK latitudes and so is always visible.

In the east 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 star Fomalhaut in the constellation of Pisces Australis (The Southern Fishes), visible very low on the southern horizon late evening at the end of the month.

In the North West Ursa Major, The Plough or The Great Bear is seen low with its handle or tail parallel to the horizon late 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. Follow the curve of Ursa Major's tail to the orange star Arcturus in the constellation Bootes (The Herdsman) low in the west. To the east of Bootes find the 'horse shoe' shaped constellation of Corona Borealis (Northern Crown) and the 'Keystone asterism' in the constellation of Hercules also noted for the globular cluster M13 containing around 750,000 stars, a good view with modest telescopes

In the east mid evening the seven sisters' (Pleiades, M45) star cluster and constellation Taurus heralds the forthcoming autumn skies of a new observing season.

Small telescopes show many of the moons craters, observing around first quarter shows fine shadow detail within craters located along the terminator where the low angle of the rising sun casts long shadows from crater rims and central peaks. Also of interest is a Clair obscure effects the Lunar 'X' and Lunar 'V' visible on the terminator around 21:30 BST on September 13<sup>th</sup>.

The Full moon closest to the equinox is the 'Harvest Moon', rising at 19:25 BST watch the Moon Illusion with the moon rising and some foreground objects such as trees etc, let your brain be fooled into thinking how 'big' the moon looks.

### Planets in September 2021

Mercury is not observable to northern hemisphere observers this month, located low in evening twilight. Venus shines brightly low in dusk skies, phase decreases to 65% by month end, sets 1 hour after the Sun. Mars sets within 20 minutes of the Sun and so is not observable this month.

Jupiter is now rises by mid evening in Capricornus, just past opposition, now is a good time to observe.

Saturn visible rises by early evening, rings is wide open in the constellation of Capricornus.

Uranus rises late evening in the constellation of Aries. (Binocular / Telescope required) (See notes).

Neptune in Aquarius close to the star phi Aquarii rises early evening (Binocular / Telescope required). The constellation of Aquarius is positioned low in the south east by mid evening Neptune is at opposition on September 14<sup>th</sup> (See notes)

### Moons phases in September 2021

New Moon	Sept 7th	Moonless, best time for deep sky observing and Comets / Asteroids
First Quarter	Sept 13th	Best days to see shadow details in lunar craters (early evening)
Full Moon	Sept 20th	Best days to see bright ray craters like Copernicus / Tycho.
Last Quarter	Sept 29th	Moon visible in daytime skies. Do not look directly at the Sun.

Autumnal Equinox occurs on September 22<sup>nd</sup> 20:21 BST, day and night being equal length - autumn begins.

### Meteor shower's

$\alpha$  Aurigids (peak Aug 31<sup>st</sup>) range to September 5<sup>th</sup>, low rates.

Epsilon Perseid also peaks on September 9<sup>th</sup> rather low rates, very favourable.

### The highlights of the month 2021

September skies, Milky Way visible high over head on moonless evenings in darker skies.

Look at the Moon illusion effect at moonrise around Full Moon i.e. the Harvest Moon rising

Saturn and Jupiter take centre stage in mid evening – Enjoy !

Uranus and Neptune, binocular objects to find using suitable finder charts

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

Albireo, the star Beta Cygnii is a nice blue/ yellow double star seen telescopically

Waxing crescent Moon visibility . **Caution. Do NOT look at the Sun directly with or without optical aid.**

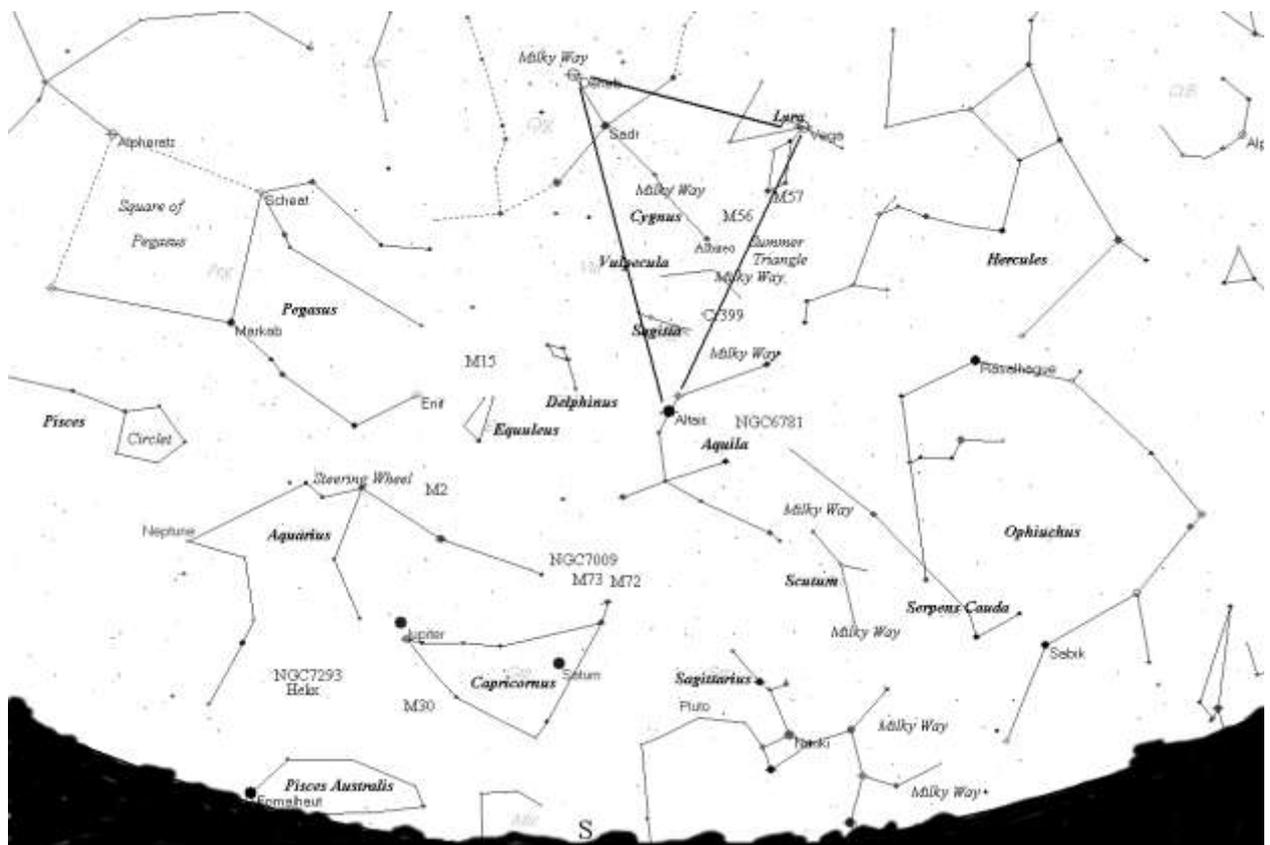
On the evening of September 7<sup>th</sup>, an ultra thin 0.8% waxing crescent moon is located very low close to the western horizon , setting by 20:14 BST i.e. just 20 minutes after sunset **[CAUTION Only look for the crescent Moon after the sun has completely set.**

On the evening of September 9<sup>th</sup> 20:00 BST , 9% waxing crescent moon is located close to Venus **after sunset**. Look for Earthshine, the faint illumination of the moons unlit features – visible in binoculars

DSLR astrophotography - Sky photography on moonless evening – 28mm /50mm lens – manual focus to infinity. Set ISO / ASA 1600, exposure 10s, remote cable release, tripod mounted – Have a go at capturing some of the star fields through Cygnus around Deneb (NGC 7000 N.American Nebula) and Scutum star cloud.

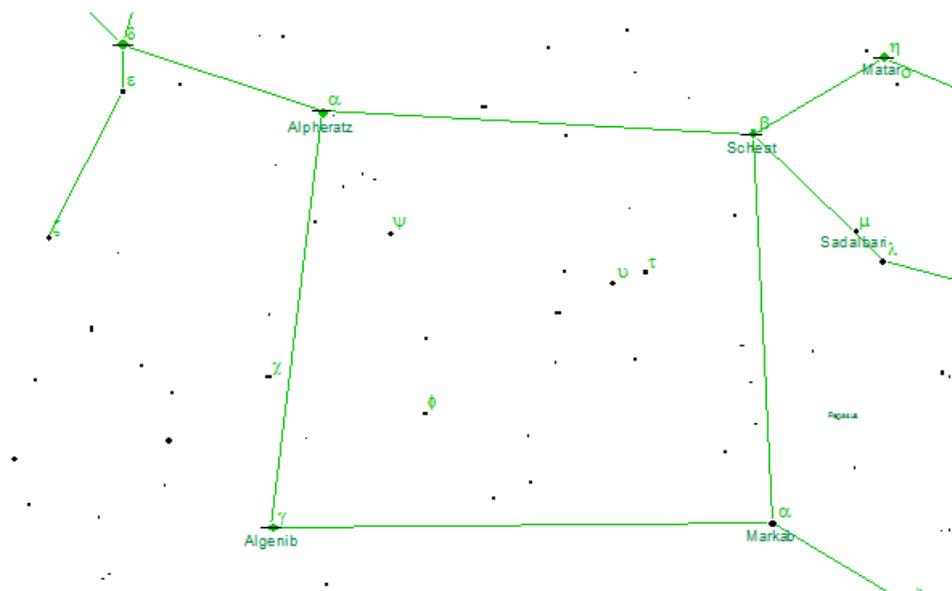
More detailed sky notes and LAS Newsletters, Finder charts are available to LAS members via the Members` page on the LAS Website More detailed sky notes and LAS Newsletters, Finder charts are available to LAS members via the Members` page on the LAS Website [www.lutonastrolink.org.uk](http://www.lutonastrolink.org.uk)

Sky looking south in mid September 2021 at 10pm BST



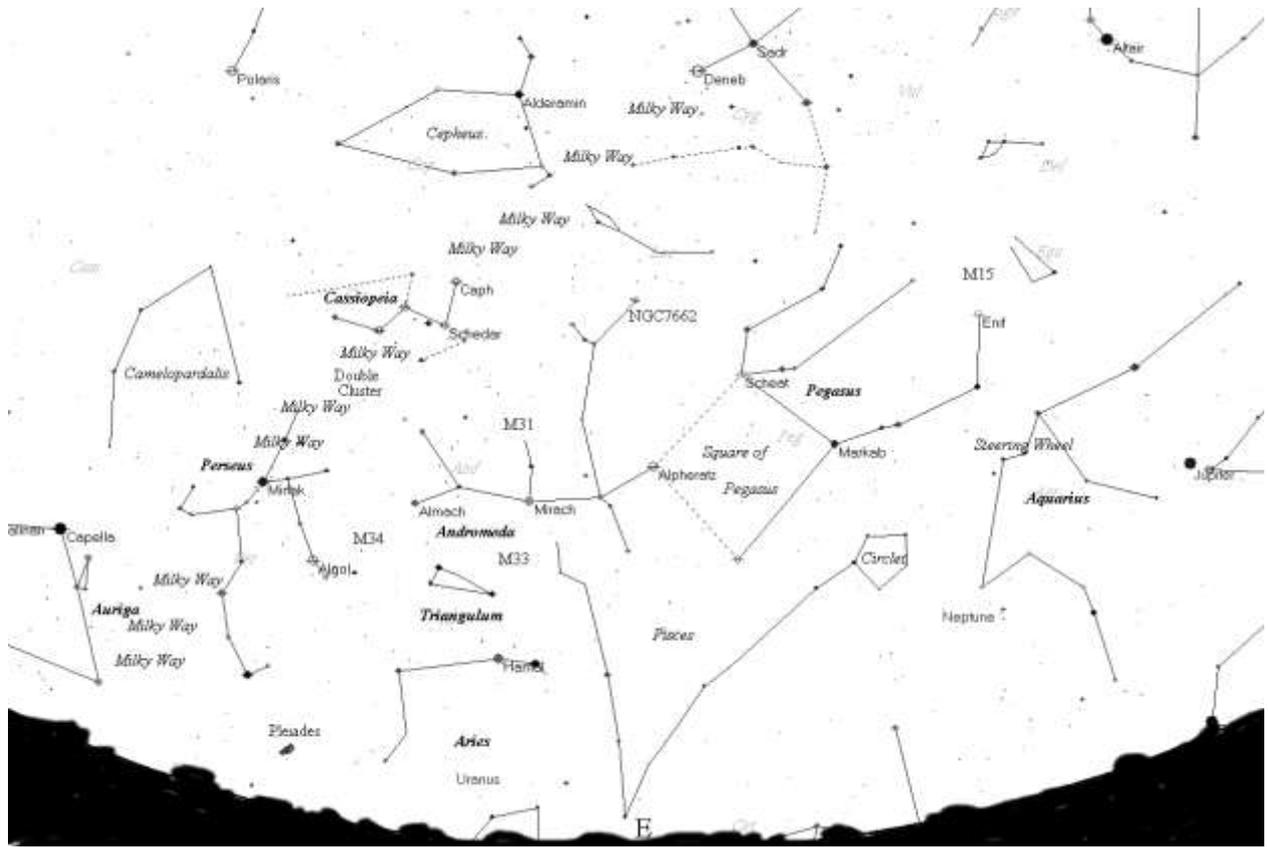
Low in the south Jupiter and Saturn in Capricornus

The number of stars visible inside the Square of Pegasus in dark moonless conditions is an indication of your sky conditions.



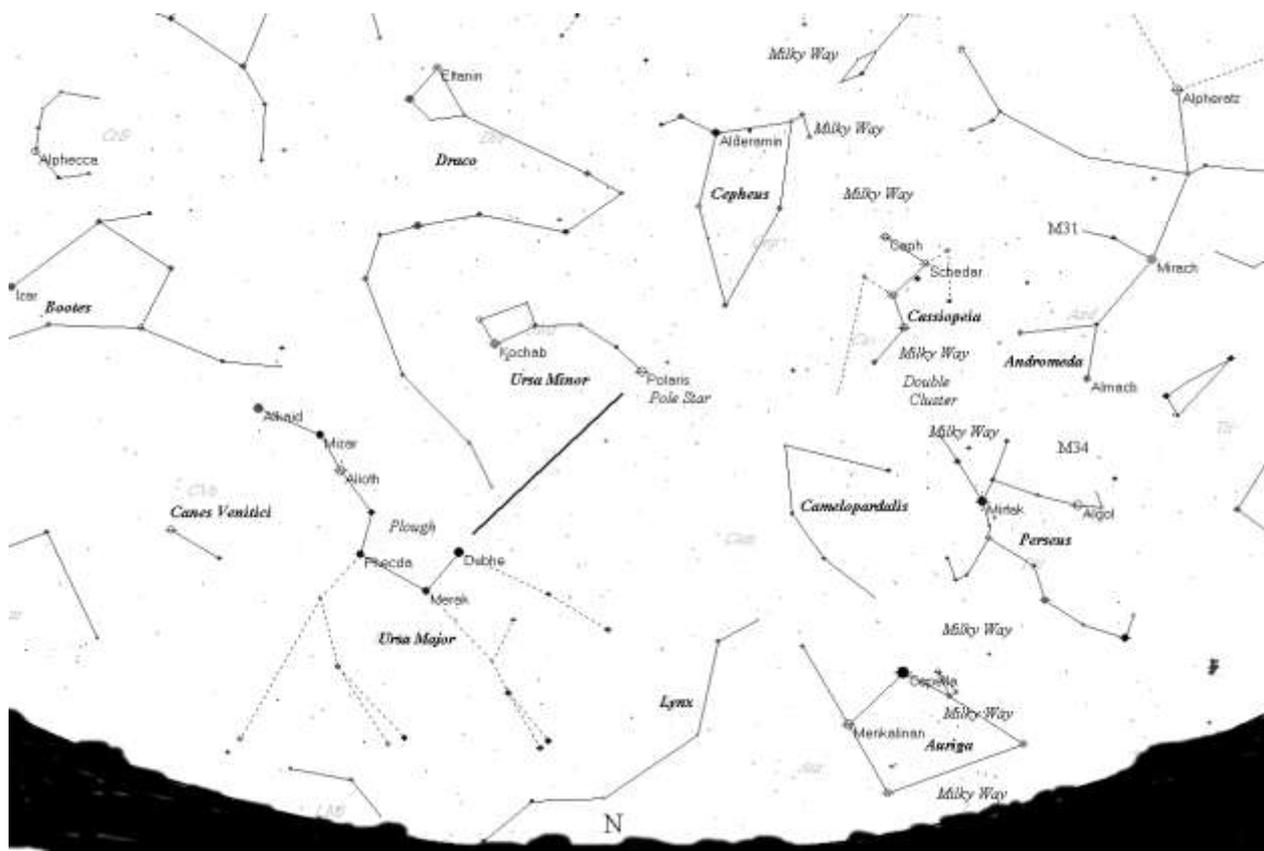
Stars shown to unaided eye limit 6<sup>th</sup> magnitude equivalent to a good dark moonless site

Sky looking east at 10pm BST mid September 2021

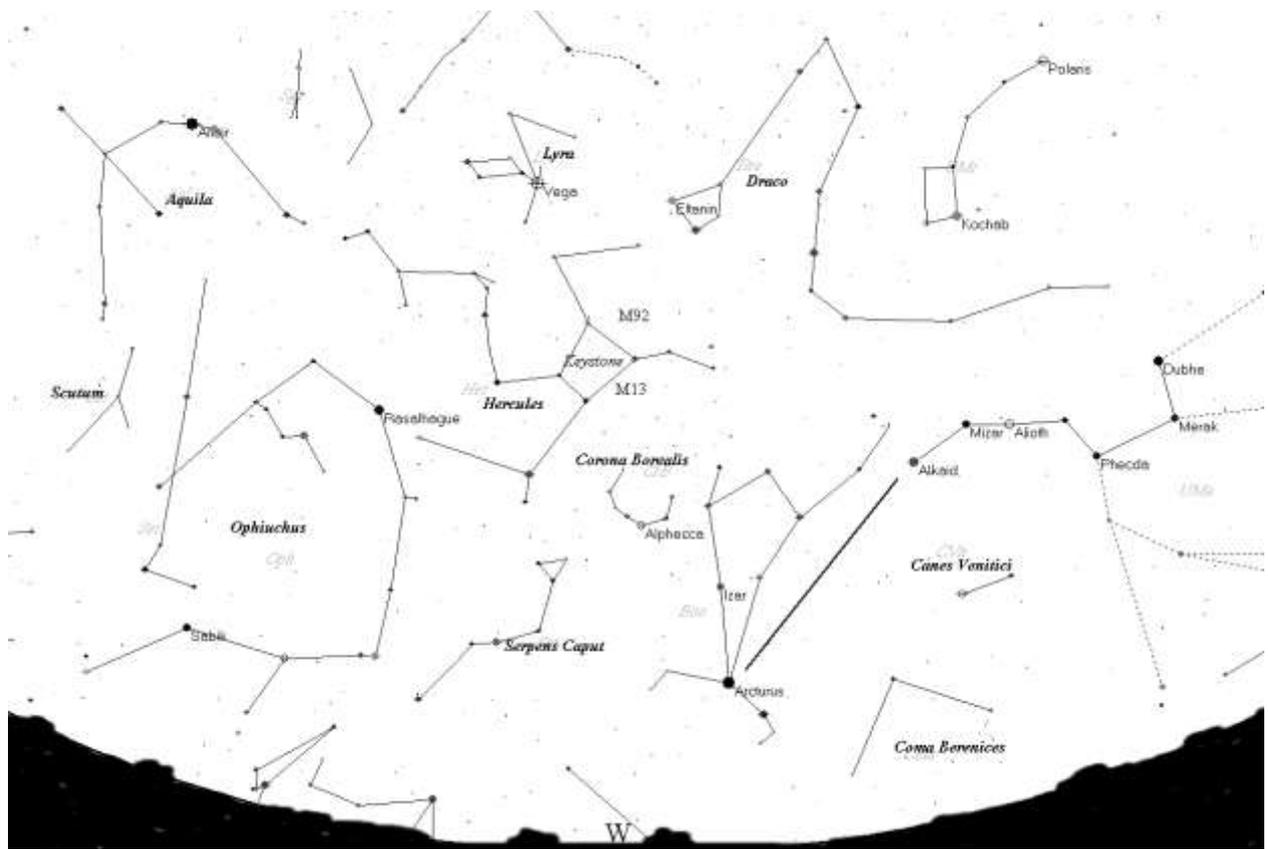


Refer to finder charts for location of Uranus and Neptune. [ Circles = FOV 10x50 Finderscope ]

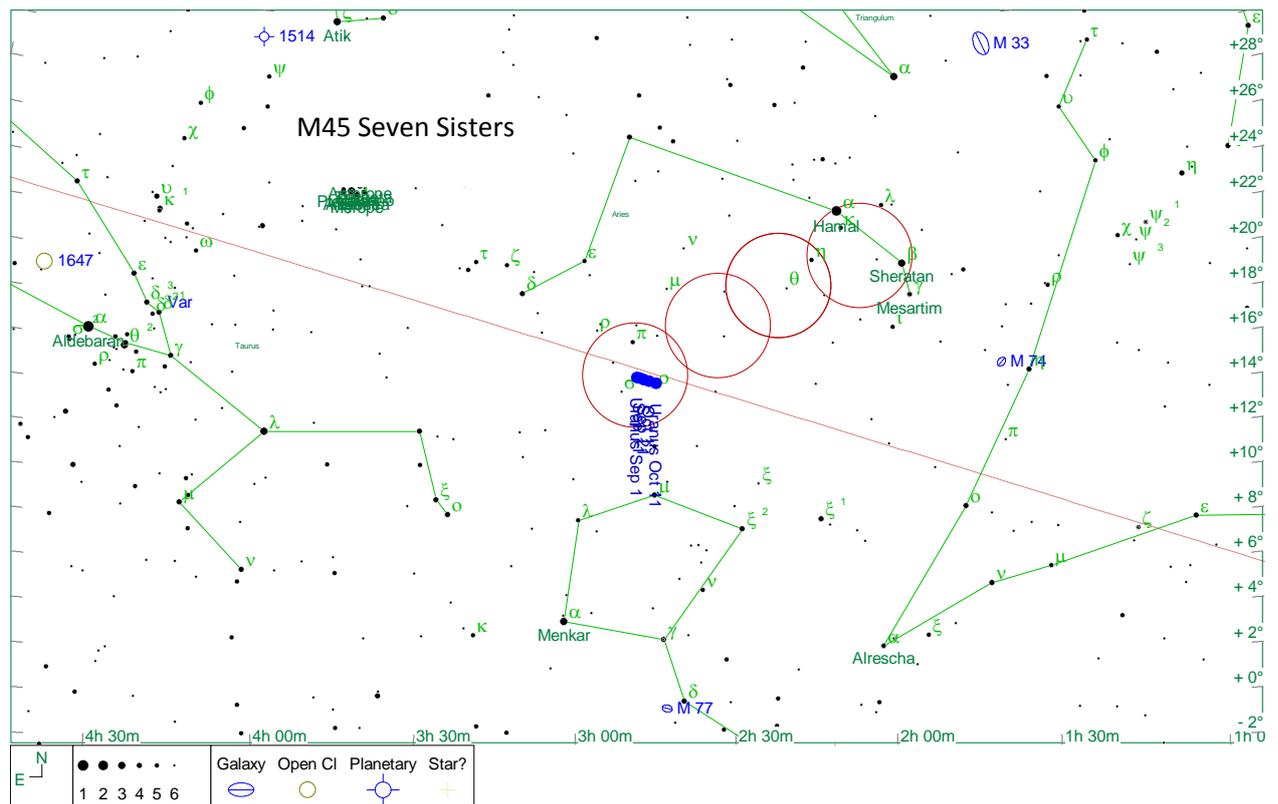
Sky looking north at 10pm mid September 2021



Sky looking west at 10pm mid September 2021



## General finder chart for locating planet Uranus (Binocular / small telescope)

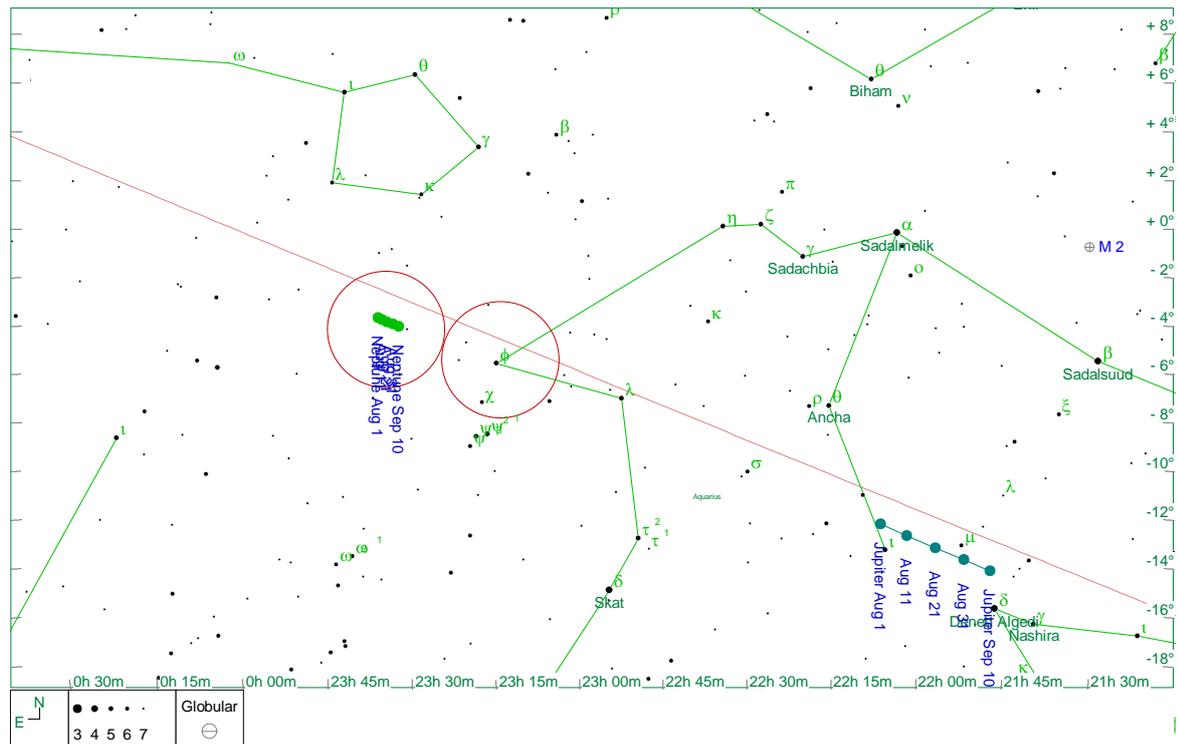


LAS general finder chart for Uranus for September / October 2021, positions shown at 5 day intervals

Note – Circles show the field of view of typical 10x50 binoculars Uranus at opposition Nov 4<sup>th</sup> 2021

Uranus is located in the constellation of Aries and rises in the east late evening in September. Telescopes show a tiny blue disk (magnitude 5.8m).

LAS general finder chart for Neptune for September / October 2021, positions shown at 5 day intervals



Neptune is visible using 10x50 binocular at magnitude 7.8m at opposition September 14<sup>th</sup> 2021

Located in the constellation of Aquarius, telescopes show a tiny greenish disk.

Note – Circles show the field of view of typical 10x50 binoculars

More detailed finder charts and newsletters are available to LAS members on the member's page