# "Ω > 1"

# Monthly "Sky-Notes" of the Open University Astronomy Club.

# November 2025.

**These "Sky-Notes" are now shared with the Bedford Astronomical Society.**

## Recent Events.

If you have any images and/or reports of recent events please contact Sheridan so that he can put them on the OUAC website.

**OUAC Clubnights.**

Currently suspended until further notice.
Observing sessions and Outreach eventswill be advised to members.

## Highlights of the Month.

**5th** **Guy Fawkes Night!**
**5th** Peak of the **Taurids** (Southern component) meteor shower.
**12th** Peak of the **Taurids** (Northern component) meteor shower.
**17th** Peak of **Leonids** meteor shower.
**20th** **Mercury at Inferior Conjunction.**
**21st** **Uranus at Opposition.**
**30th.** **St Andrews Day.**

## Software.

A very useful item of Planetarium software is "Stellarium" and it's **FREE!**
Go to their website and download it and the associated user manual.

# 1. The Solar system.

**Note all times shown are UT.**
**Add one hour when British Summer Time is in operation.**

## Earth.

**Aurora.**
Long hours of darkness improve the opportunity for observing potential aurora.
Keep tuned to the www.spaceweather.com site for updates.
Subscribe (free!) to the UK AuroraWatch website to receive alerts.

**Artificial Satellites.**
Details of the ISS and other "bright" satellites are available on the "Heavens above" website. Go to the "Heavens Above" website and set-up for your location. Add to your "favourites".
Alternatively go to the "spaceweather" website and click the "Flybys" button and follow the instructions to set-up forecasts for your location. Add to your "favourites".

**Sunrise and Sunset.**

**Bedford.**
**Latitude 52° 6.9'N Longitude 0° 28.1'W**

| Date. | Rise. | Transit. | Set. |
|---|---|---|---|
| 01 | $06^h\ 57^m$ | $11^h\ 45^m$ | $16^h\ 33^m$ |
| 08 | $07^h\ 10^m$ | $11^h\ 45^m$ | $16^h\ 21^m$ |
| 15 | $07^h\ 23^m$ | $11^h\ 46^m$ | $16^h\ 10^m$ |
| 22 | $07^h\ 34^m$ | $11^h\ 48^m$ | $16^h\ 01^m$ |
| 29 | $07^h\ 45^m$ | $11^h\ 50^m$ | $15^h\ 55^m$ |

Produced using "Starry Night Pro".

## The Sun.

## Observing.

**To prevent permanent damage to your eyes avoid looking at the Sun directly and never with binoculars or a telescope unless special (expensive!) filters are used. The safest way is the simplest – project the image of the Sun onto grey or white card.**
**Take care if your telescope has any plastic components in its optical path. Plastic melts!**
If you have or have access to observe in h-alpha the rewards are much greater.

**Solar Cycle 25** at **Solar Max** continues to produce good activity!

Add the "**Spaceweather**", the "**SOHO**" and the"**S**olar **D**ynamics **O**bservatory" satellite websites to your "favourite" websites.

## The Moon.

### Phases:


Produced using “Lunar Phase Pro”.

| | | |
|---|---|---|
| Full | $05^{d}\ 13^{h}\ 19^{m}$ | At Perigee = A “Supermoon”. |
| Last quarter | $12^{d}\ 05^{h}\ 28^{m}$ | |
| New | $20^{d}\ 06^{h}\ 48^{m}$ | |
| First quarter | $28^{d}\ 06^{h}\ 59^{m}$ | |

### Apsides:

| | | | |
|---|---|---|---|
| Perigee | $05^{d}\ 22^{h}$ | Diameter. 33’ 28” | Distance. 356,832km. |
| Apogee | $20^{d}\ 03^{h}$ | Diameter. 29’ 22” | Distance. 406,690km. |

### Observing.

Observe the regions along the terminator (sunrise and sunset on the Moon) where the low angle of the Sun highlights lunar topography. A basic lunar map is all you need to get started. *Sky & Telescopes* “Lunar 100 Card” is another good starting point. The Moon provides an excellent target if you are starting out on astronomical photography/imaging.

## The Moon cont.

**For northern observers:**

The waxing crescent Moon is not well placed.
The waxing gibbous Moon is becoming well placed.
The Full Moon is well placed.
The waning gibbous Moon is very well placed.
The waning crescent Moon is becoming less well placed.

**Imaging and Observing Opportunities.**

Predawn observation and/or imaging will be well rewarded when the waning gibbous Moon and the waning crescent Moon are well placed.

**Lunar Occultations.**

Unlike the gradual disappearance of a planet (small disc) a star vanishes instantly demonstrating that it is a point source of light as viewed from the earth. For all occultation events start observing 10 to 15 minutes before the predicted time to identify the required star and to allow for slightly different time if you are not at Greenwich. Use an accurate watch to record the time that *you* observe the occultation remembering that times are UT not BST. Enter details in your observing log.

Details of occultations can be found in current *BAA Handbook* and monthly periodicals such as *Astronomy Now* and *Sky at Night*.

# The Planets.

## Mercury.

Unlikely to be spotted very low in the SW evening twilight as it heads for **Inferior Conjunction on 20th.**
Watch for reappearance low in SE dawn sky at the end of the month.
Moon close N/A.

| Date. | Mag. | Dia. | Phase. | Rise. | Transit. | Set. |
|---|---|---|---|---|---|---|
| 30 | 0.2 | 8.1" | 0.33 | $06^h\ 00^m$ | $10^h\ 40^m$ | $15^h\ 20^m$ |

## Venus.

Now losing its prominence low in the SE predawn/dawn sky.
Moon close on 19th.

| Date. | Mag. | Dia. | Phase. | Rise. | Transit. | Set. |
|---|---|---|---|---|---|---|
| 01 | -3.9 | 10" | 0.96 | $05^h\ 21^m$ | $10^h\ 45^m$ | $16^h\ 10^m$ |
| 30 | -3.9 | 10" | 0.99 | $06^h\ 56^m$ | $11^h\ 13^m$ | $15^h\ 31^m$ |

## Mars.

Not observable.
Moon close on 21st.

| Date. | Mag. | Dia. | Phase. | Rise. | Transit. | Set. |
|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - |

Mission details and progress of "Orbiters", "Landers" and Rovers are on the appropriate websites.

## Jupiter.

Prominent object rising mid evening in the NE sky.
With its high northern declination a fine season is underway.
Moon close on 10th.

| Date. | Mag. | Dia. | Rise. | Transit. | Set. |
|---|---|---|---|---|---|
| 01 | -2.3 | 41" | $21^h\ 00^m$ | $03^h\ 11^m$ | $11^h\ 15^m$ |
| 30 | -2.5 | 44" | $19^h\ 03^m$ | $00^h\ 30^m$ | $08^h\ 39^m$ |

## Saturn.

Well placed in S to SW evening to mid-night sky.
Moon close on 2nd & 29th.

| Date. | Mag. | Dia. | Rise. | Transit. | Set. |
|---|---|---|---|---|---|
| 01 | +1.1 | 19" | $15^h\ 22^m$ | $21^h\ 05^m$ | $02^h\ 51^m$ |
| 30 | +1.06 | 18" | $13^h\ 27^m$ | $19^h\ 08^m$ | $00^h\ 54^m$ |

## Uranus.

**At Opposition on 21st.**

Located in Taurus about 4° south of M45 "The Pleiades" and well placed for nightlong observation.

Moon close on 6th.

| Date. | Mag. | Dia. | Rise. | Transit. | Set. |
|---|---|---|---|---|---|
| 01 | +5.6 | 3.8" | $17^h\ 13^m$ | $01^h\ 12^m$ | $09^h\ 07^m$ |
| **21** | **+5.6** | **3.8"** | **$15^h\ 53^m$** | **$23^h\ 46^m$** | **$07^h\ 44^m$** |
| 30 | +5.6 | 3.8" | $15^h\ 16^m$ | $23^h\ 09^m$ | $07^h\ 06^m$ |

## Neptune.

Well placed in S to SW evening to mid-night sky.

Easy to locate a few degrees NE of Saturn.

Moon close on 2nd & 29th.

| Date. | Mag. | Dia. | Rise. | Transit. | Set. |
|---|---|---|---|---|---|
| 01 | +7.8 | 2.3" | $15^h\ 22^m$ | $21^h\ 18^m$ | $03^h\ 17^m$ |
| 30 | +7.9 | 2.3" | $13^h\ 27^m$ | $19^h\ 22^m$ | $01^h\ 21^m$ |

**Triton.**

At mag +13.5 Neptune's largest satellite provides a good challenge for 8" telescopes under favourable sky conditions and when Triton is at max elongation E or W of Neptune.

Use "Stellarium" (Freeware) or similar software to determine favourable E and W elongations.

Use a high magnification e.g. x200 or greater.

## Dwarf Planets.

**Ceres.** An 8th mag object located in Cetus.

**Eris.** A mag +18.7 target located in Cetus.

**Haumea.** A mag +17.3 CCD target located in Boötes becoming lost in WNW evening twilight.

**MakeMake.** A mag +17 CCD target in Coma Berenices. Low in the E predawn skies.

**Pluto.** Lost in the SW evening twilight.

## Asteroids. (Approx mag +10.5 or brighter).

**Vesta (4).**

Becoming lost in the SW evening twilight.

**Victoria (12).**

Located in Taurus. Mag +9.8 at **Opposition on 5th.**

**Papagena (471).**

Located in Aries. Mag +9.1 at **Opposition on 10th**.

**Leto (68).**

Located in Taurus. Mag +10.0 at **Opposition on 20th**.

Up to date details of asteroids can be found on the "Heavens above" website.

## Comets.

**C/2025 A6 (Lemmon).**

Just visible to the naked eye from a dark site and a fine object in binoculars/small telescopes. Strong moonlight spoils the view in the first week of the month as it reaches Perihelion on 8th November. It then tracks rapidly south becoming lost to observers.

**C/2025 R2 SWAN.**

A 6th mag object well placed as it moves moving from Aquarius into Pisces.

**24P/Schaumasse.**

Currently a 14th mag object it crosses in front of M44 "The Beehive" from 7th to 11th of November. It will be in front of the cluster on the 8th/9th. One for imagers!

Up to date details of comets can be found on the "Heavens above" website.
Charts and details of selected comets are available at:
http://britastro.org/computing/charts_comet.html
See also the *BAA Handbook* and monthly periodicals.

## Meteor Showers.

The **Taurids** continue activity during November. Double radiant with two peaks on 5th (S component) - ZHR = 5, Moonlight interferes!; and 12th (N component) - ZHR = 5, some interference from Moonlight. Slow meteors with "bright events" possible. Occasional "Swarm" activity.
The **Leonids** are active from the 15th to 20th with narrow peak activity on 17th 12h, ZHR = 15. Favourable!
There are always **Sporadic** events and the chance of a brilliant fireball. The latter should be recorded and reported.

## Near Earth Objects.

Please refer to www.spaceweather.com for updates.

## Eclipses.

No Lunar or Solar Eclipses this month.

# 2. Deep Sky.

Abbreviations used.

**M** = Messier object. (Shown in **Bold**).
NGC = New General Catalogue. IC = Index Catalogue. (Extension of the NGC).

| | | |
|---|---|---|
| ds = double star. | ts = triple star. ms = multiple star. | vs = variable star. |
| gc = globular cluster. | oc = open cluster. | pn = planetary nebula. |
| en = emission nebula. | rn = reflection nebula. | sg = spiral galaxy. |
| eg = elliptical galaxy . | lg = lenticular galaxy. | ir = irregular galaxy. |
| pg = peculiar galaxy. | snr = super nova remnant. | ly = light year. |

The magnitude of an object, excluding double, triple, multiple and variable stars, is shown in brackets e.g. (+6.5).

## 2.1 Variable Stars of the month.

**Beta (β) Persei, Algol.**

Range +2.2 to +3.4, period 2.7 days. Well placed for evening observation. Minima at "social hours" on $07^d\ 23.1^h$, $10^d\ 19.9^h$ and $30^d\ 21.6^h$.

**Delta (δ) Cephei.**

Range +3.5 to +4.4, period 5.37 days. The prototype for the Cepheid class of variable stars. Their period-luminosity relationship has led them to being used as "standard candles" in measuring distances to nearby galaxies.

**Mu (μ) Cephei.**

Range +3.7 to +5.0, approximate period 755 days. A semi-regular variable star famous for its striking red colour being fittingly called "Herschel's Garnet Star". It is the reddest naked eye star visible from the northern hemisphere. Its colour may show signs of variability.

## 2.2 Double Stars of the month.

**Gamma And.** See notes below.
**Gamma Ari.** See notes below.
**Struve (Σ) 326 Ari.** See notes below.
**Alpha Cas.** See notes below.
**Iota Cas.** See notes below.
**Eta Cas.** See notes below.
**Sigma Cas.** See notes below.
**Delta Cep.** See notes below.
**Struve (Σ) 2816 & 2819 Cep**. See notes below.
**Struve (Σ) 2840 Cep**. See notes below.
**8 Lac.** Quadruple system**.** See notes below.
**Eta Peg.** See notes below.
**Pi$^{1\&2}$ Peg.** See notes below.
**57 Peg.** See notes below.
**Zeta Psc.** See notes below.
**35 Psc.** See notes below.
**51Psc.** See notes below.
**Iota Tri.** See notes below.
**Struve (Σ) 239 Tri.** See notes below.

## 2.3 This Month's Constellations - Double Stars, Star Clusters, Nebulae and Galaxies.

### Andromeda (And).

Gamma (γ) Almach (+2.2/+5.1) is a fine double star. The brighter component is golden-yellow with its companion a greenish-blue. Arguably second only to Albiro in Cygnus.
NGC205 **(M110)** (+8.0) eg. A satellite galaxy of M31 visible as an elongated "smudge" in small telescopes.
NGC221 **(M32)** (+8.2) eg. A satellite galaxy of M31. Visible as a fuzzy star in small telescopes.
NGC224 **(M31)** (+3.5) sg. "The Great Andromeda Spiral Nebula". Increasing aperture reveals more and more detail although increasingly smaller areas of the galaxy fill the eyepiece. 8" telescopes should reveal NGC206 as a hazy patch. It is a large area of star formation. 12" scopes will reveal one or two of M31's large population of globular clusters.
NGC404 (+11.9) lg. "The Ghost of Mirach". Located 6' NW of β And (Mirach). The 2nd magnitude star tends to drown the faint glow of the galaxy. Use high power to push the star out of the field of view for best results.
NGC752 (+5.7) oc This large open cluster is located about 4 degrees south of γ.
NGC891 (+10.1) sg. Located about 3 degrees east of γ is seen almost edge on. Bright central bulge. Moderate apertures will reveal a narrow dust lane bisecting the long axis. A fine object!
NGC7640 (+12.5) sg. Seen nearly edge-on.
NGC7662 (+8.6) pn. "The Blue Snowball". Rather small making it difficult to distinguish from nearby faint stars. High magnification on an 8" telescope will reveal an elliptical ring with a dark centre. Large apertures will show a faint second outer ring of nebulosity and the 13th magnitude central star.

### Aries (Ari).

Gamma (γ) (+4.8/+4.8 separation 7.7") ds. Fine equally bright bluish-white pair of stars. Accidentally discovered by Robert Hooke in 1664 while searching for a comet.
Lambda (λ) (+4.9/+7.7 sep. 37.4") ds. Wide pair of pale yellow and pale blue stars.
Struve (Σ)326. (+7.6/+9.8 sep. 5.9") ds. Beautiful orange and dull red pair of stars.
NGC772 (10.3) sg. Located almost 2° ESE of γ.
NGC877 (+11.9) sg.
NGC972 (+11.4) sg.

### Cassiopeia (Cas).

Alpha (α) (+2.2/+8.9 sep. 64.4") ds. Fine orange and blue pair. Part of a multiple system.
Iota (ι) (+4.6/+6.9/+8.4 sep. AB 2.5", AC 7.2") ts. Beautiful white, yellow and blue triple system.
Eta (η) (+3.4/+7.5 sep. 12.9") ds. Superb gold and garnet pair. What do you see?
Sigma (σ) (+5.0/+7.1 sep. 3.0") ds. Bluish white and yellow pair in a superb field.
NGC129 (+6.5) oc.
NGC147 (+9.3) eg. A satellite galaxy of M31.
NGC185 (+9.2) eg. A satellite galaxy of M31.
NGC278 (+10.9) eg. Located a few degrees SE of NGC185.
NGC457 (+6.4) oc. "The Owl Cluster". Fine object.
NGC581 (**M103**) (+7.4) oc. Fine object.
NGC654 (+6.5) oc, NGC663 (+7.1) oc and NGC659 (+7.9) oc. A north to south line of open clusters in the same 1° field about 1° east of **M103**.
NGC7654 (**M52**) (+6.9) oc. Fine rich cluster. **Cassiopeia cont.**

## Cassiopeia cont.

NGC7789 (+6.7) oc. “Caroline’s (Herschel) Rose”. Superb rich cluster!
NGC7790 (+) oc.
IC1805 (+6.5) oc.
IC1848 (+6.5) oc.

## Cepheus (Cep).

Delta (δ) Cephei, +3.5 to +4.4 over a period 5.37 days, is the prototype for the Cepheid class of variable stars which because of their period-luminosity relationship has lead them to being used as "standard candles" in measuring distances to nearby galaxies. Pale blue +6.1 companion.
Mu (μ) Cephei +3.7 to +5.0 approximate period 755 days is a semi-regular variable star. It is more famous for its striking red colour being fittingly called "Herschel's Garnet Star". It is the reddest naked eye star visible from the northern hemisphere. Its colour may show signs of variability.
Struve (Σ) 2816 ts (+5.7/+7.5/+7.5, sep 12”/20”). Fine triple with Struve (Σ) 2819 ds (+7.4/+8.6, sep 13”) in same field. All contained in the large, sparse and nebulous open cluster IC 1396!
Struve (Σ) 2840 ds (+5.6/+6.4, sep 18”. Very fine greenish/bluish pair.
Open clusters - NGC188 (+8.1), NGC6939 (+7.8), NGC7510 (+7.9), NGC7762 (+10.0). Planetary Nebula NGC40 (10.7).
Spiral galaxy NGC6946 (+8.9) in the same 1º field as oc NGC6939. Two types of object for the price of one!
The faint reflection nebula NGC7023 and emission nebula IC 1396 provide a challenge to the observer. A dark clear sky is essential.

## Lacerta (Lac).

Struve (Σ) 2876 (+7.8/+9.3 sep 11.8”) ds. Fine blue and white double.
Struve (Σ) 2894 (+6.1/+8.3 sep. 15.6”) ds. Yellow primary, blue secondary.
Struve (Σ) 2902 (+7.6/+8.5 sep. 6.4”) ds. Yellow and white double.
8 Lacertae = Struve (Σ) 2922 (+5.7/+6.5 sep. 22.4”) Multiple star. Brightest four components are white/blueish white. Has been described as a poor open cluster.
O Struve (Σ) 475 (+6.8/+10.8 sep. 15.5”) ds. White primary with faint blue companion.
BL Lacertae (+14 to +17). Prototype for class of quasi-stellar object (QSO).

## Pegasus (Peg).

Eta (η) +2.9/+9.9 separation 90.4”. Binocular object. Yellow and blue components but telescope required to see colour of secondary. Herschel’s “Pendulum Star” - tap telescope gently for the effect.
$Pi^{-1}/Pi^{-2}$ ($\pi^{-1}/\pi^{-2}$) +5.6/+4. 3 separation 7’). Fine binocular object. $Pi^{-1}$ is a multiple system with 4 companions of $10^{th}$ to $12^{th}$ magnitude.
51 Pegasi (+5.5). Identify this star for interest as the first sun-like star discovered in October 1995 to have an “exoplanet”. The planet was original named “51 Pegasi b” but in December 2015 following a process of public nomination the IAU announced the winning name was **Dimidium**.
57 Pegasi. +5.1/+9.7 separation 32.6”. Beautiful orange primary with blue companion.
NGC7078 (**M15)** (+6.3) gc superb object.
NGC7331 (+9.5) sg. Seen almost edge on.
About half a degree south is the fascinating group of galaxies "Stephan's Quintet". The brightest member of the group is NGC7320 (+12.7).
Many happy hours can be spent wandering around "The Square" to locate many moderately bright galaxies. Use a star atlas such as the excellent "Sky Atlas 2000", “Stellarium” or similar software to plan your journey.

## Pisces (Psc).

Alpha (α) (+4.2/+5.1 sep.1.5") ds. Requires a large aperture telescope using high magnification to split this pair of bluish-white stars.
Zeta (ζ) (+5.6/+6.2 sep. 23") ds. Fine white and yellow pair of stars.
35 (+6.0/+7.6 sep 7.6") ds. Fine yellow and blue pair.
51 (+5.7/+9.5 sep.27.5") ds. Glorious bluish and greenish pair of stars.
65 (+6.3/+6.3 sep 4.4") ds. Fine matched pair of pale yellow stars.
Wolf 28 (+12.3). Van Maanen's Star. One of the few white dwarf stars visible in amateur telescopes.
NGC128 (+11.8) sg. Brightest of a group of five galaxies.
NGC488 (+10.3) sg. Elongated halo with brighter core.
NGC628 (**M74**) (+9.4) sg. Seen face on and hence low surface brightness.
NGC7541 (+11.7) sg. Elongated oval with bright core. 3' to the SW is NGC7537 (+13.0)

## Sculptor (Scl).

Unfortunately this constellation never rises very high for UK observers so that only brief opportunities are presented to track down some deep-sky gems which unfortunately are not seen at their best even from a dark site. I have taken declination -30º as the southern limit for objects. This is almost the declination of the first magnitude star Fomalhaut (+1.16) which will give you a marker as to how low these objects are even at their highest when due south. The suitable observation window is thus fairly restricted!
NGC24 (+11.5) sg. Located about two-thirds the way between NGC253 and β Cet.
NGC253(+7.1) sg. Seen highly inclined to our line of sight. Increasing magnification reveals mottling due to dust lanes. Head south for the best view of this gem.
NGC288 (+8.1) gc. A loose globular which resolves readily with high power. The South Galactic Pole is about a 1º to the SW.
NGC613 (+10.0) sg. Elongated and fairly bright.

## Triangulum (Tri).

Iota (ι) (+5.3/+6.9 sep. 3.9") ds. Fine contrasting yellow and blue pair of stars.
Struve (Σ)239 (+7.0/+8.0 sep. 13.8") ds. Fine pale yellow and pale blue pair of stars.
NGC598 **(M33)** (+5.7) sg. Viewed face-on and hence has a low surface brightness making it an elusive object. Its visibility provides a good test for sky conditions using binoculars.
From dark sites and under good seeing conditions it is just visible to the naked eye and vies with M31 as the most distant object visible to the naked eye. With 8"+ telescopes try to locate the vast star cloud NGC604. Good target for imaging.
NGC672 (+11.6) sg. A bright barred spiral galaxy seen somewhat edge-on.
NGC925 (+12.0) sg. Steeply inclined to our line of sight makes it fairly bright.NGC598

P.V.H.