

“ $\Omega > 1$ ”

## “Sky-Notes” of the Open University Astronomy Club.

August 2010.

### Forthcoming Meetings.

OUAC Clubnights recommence on Tuesday 7<sup>th</sup> September.

Full details of BAA meetings at: [www.britastro.org](http://www.britastro.org)

### Highlights of the Month.

During early August Venus, Mars and Saturn provide a changing series of conjunctions low in the W and WSW evening twilight sky. Mercury is a more difficult object much closer to the horizon during first two weeks. A thin crescent Moon joins the action on the 13<sup>th</sup>. Numerous camera opportunities if you have a clear horizon.

The Perseids meteor shower is active until the 20<sup>th</sup>.

- 1 Mars 2° S of Saturn.
- 7 Mercury greatest elongation E (27°).
- 10 Venus 3° S of Saturn
- 12 Peak activity Perseids meteor shower.
- 12 Mercury 3° N of very thin crescent Moon.
- 13 Conjunction of Moon, Mars, Saturn and Venus.
- 20 Venus greatest elongation E (46°). Mars about 2° N of Venus.
- 20 Neptune at opposition.

Jupiter dominates the SE and S post midnight and predawn skies as it approaches opposition in September.

### Recent Events.

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

If you wish to present them at a Clubnight meeting please contact Sheridan or myself before the meeting starts.

## 1. Solar system.

**Note all times shown are UT.**

### Earth.

Early August sees the end of the Noctilucent Clouds “season”. Look to the NW evening and NE morning twilight skies for possible displays in the first week.

**Sunrise and Sunset (Great Barford, Bedfordshire,  
Lat 52° 9.4’ N Long 0° 20.8’ W).**

Date.	Rise.	Transit.	Set.
01	04 <sup>h</sup> 23 <sup>m</sup>	12 <sup>h</sup> 07 <sup>m</sup>	19 <sup>h</sup> 50 <sup>m</sup>
08	04 <sup>h</sup> 35 <sup>m</sup>	12 <sup>h</sup> 07 <sup>m</sup>	19 <sup>h</sup> 37 <sup>m</sup>
15	04 <sup>h</sup> 46 <sup>m</sup>	12 <sup>h</sup> 05 <sup>m</sup>	19 <sup>h</sup> 23 <sup>m</sup>
22	04 <sup>h</sup> 58 <sup>m</sup>	12 <sup>h</sup> 04 <sup>m</sup>	19 <sup>h</sup> 09 <sup>m</sup>
29	05 <sup>h</sup> 09 <sup>m</sup>	12 <sup>h</sup> 02 <sup>m</sup>	18 <sup>h</sup> 54 <sup>m</sup>

Produced using Starry Night Pro.

### Sun.

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.

The new Solar Dynamics Observatory satellite is now returning superb images both still and video. Add the website <http://sdo.gsfc.nasa.gov/> to your favourites.

Hours of darkness are slowly increasing and therefore increase the opportunity for observing potential aurora.

Keep tuned to the [www.spaceweather.com](http://www.spaceweather.com) site for updates.

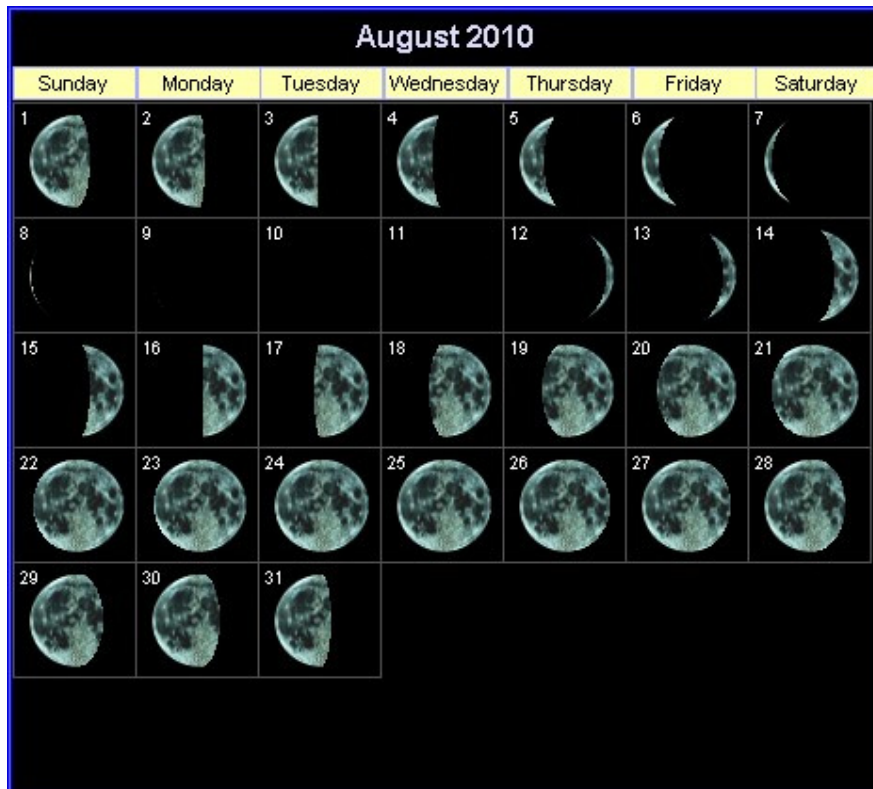
Subscribe (free) to the UK AuroraWatch website to receive alerts.

Add the “Spaceweather” and the “Soho Lasco C3” websites to your favourites.

**Moon.**

**Phases:**

Last quarter 03<sup>d</sup> 04<sup>h</sup> 59<sup>m</sup>  
 New 10<sup>d</sup> 03<sup>h</sup> 08<sup>m</sup>  
 First quarter 16<sup>d</sup> 18<sup>h</sup> 14<sup>m</sup>  
 Full 24<sup>d</sup> 17<sup>h</sup> 05<sup>m</sup>



Produced using LunarPhase Pro.

**Apsides:**

Perigee 10<sup>d</sup> 18<sup>h</sup> Diameter. 33' 23" Distance. 361,116km.  
 Apogee 25<sup>d</sup> 06<sup>h</sup> Diameter. 29' 24" Distance. 406,388km.

**For northern observers:**

The waxing crescent Moon is becoming less well placed.

The waxing gibbous Moon is less well placed.

The Full Moon is less well placed.

The waning gibbous Moon is better placed.

The waning crescent Moon is well placed for early hour and predawn observers.

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. If you are starting out on photography and/or imaging the Moon will provide an excellent target.

If you would like to obtain the "Lunar 100 Card" please see me at a Clubnight meeting.

**Lunar Project Group please note!**

The first and last weeks of August provide excellent opportunities to observe and/or image the elusive Mare Orientale. Dates when libration is most favourable for this feature are 5<sup>th</sup> and 31<sup>st</sup>. The bad news for some is that predawn provides the best opportunities when the Moon is high in the sky.

**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. Disappearance is behind the dark limb (DD) of the Moon unless otherwise stated. Enter details in your observing log.

Date. ZC No. Name. Mag. Time.

No "bright" events at social hours this month.

Further details can be found in current *BAA Handbook* and monthly periodicals such as *Astronomy Now* and *Sky at Night*.

## The Planets.

### Mercury.

Very low in W evening twilight.

Greatest Elongation E ( $27^\circ$ ) on 7<sup>th</sup>.

Moon close on 11<sup>th</sup>.

Date.	Mag.	Dia.	Phase.	Rise.	Transit.	Set.
1	+0.23	7.0''	0.56	07 <sup>h</sup> 00 <sup>m</sup>	13 <sup>h</sup> 50 <sup>m</sup>	20 <sup>h</sup> 40 <sup>m</sup>
7	+0.42	7.7''	0.47	07 <sup>h</sup> 17 <sup>m</sup>	13 <sup>h</sup> 49 <sup>m</sup>	20 <sup>h</sup> 19 <sup>m</sup>

Keep in touch with data and images from the Messenger Spaceprobe at <http://messenger.jhuapl.edu>

### Venus.

Brilliant object in W evening twilight.

Greatest Elongation E ( $46^\circ$ ) on 20<sup>th</sup>.

Passes  $3^\circ$  S of Saturn on 10<sup>th</sup>.

Passes  $2^\circ$  S of Mars during third week.

$1^\circ$  S of Spica on 31<sup>st</sup>.

Moon close on 12<sup>th</sup>/13<sup>th</sup>.

Date.	Mag.	Dia.	Phase.	Rise.	Transit.	Set.
01	-4.2	20''	0.58	08 <sup>h</sup> 43 <sup>m</sup>	14 <sup>h</sup> 59 <sup>m</sup>	21 <sup>h</sup> 15 <sup>m</sup>
31	-4.4	28''	0.42	09 <sup>h</sup> 43 <sup>m</sup>	14 <sup>h</sup> 44 <sup>m</sup>	19 <sup>h</sup> 44 <sup>m</sup>

### Mars.

Low in the W evening twilight.

The disc is now very small.

Moon close on 12<sup>th</sup>/13<sup>th</sup>.

Date.	Mag.	Dia.	Phase.	Rise.	Transit.	Set.
01	+1.47	4.7''	0.93	09 <sup>h</sup> 24 <sup>m</sup>	15 <sup>h</sup> 27 <sup>m</sup>	21 <sup>h</sup> 29 <sup>m</sup>
31	+1.50	4.4''	0.95	09 <sup>h</sup> 16 <sup>m</sup>	14 <sup>h</sup> 38 <sup>m</sup>	20 <sup>h</sup> 00 <sup>m</sup>

The **Spirit** and **Opportunity** rovers continue their explorations. **Spirit** has become a static scientific platform and continues to make valuable scientific observations. Whether it will survive the rigours of the Martian winter remains to be seen.

Visit the appropriate websites for updates.

## Jupiter.

Dominates the “early hours” SE and S skies.

Increasing N declination heralds better viewing for northern observers.

The South Equatorial Belt has currently faded from view, not the first time and it will return.

Important to monitor for its reappearance.

Moon close on 26<sup>th</sup>.

Excellent target for webcam imaging.

Date.	Mag.	Dia.	Phase.	Rise.	Transit.	Set.
01	-2.69	46”	-	21 <sup>h</sup> 30 <sup>m</sup>	03 <sup>h</sup> 37 <sup>m</sup>	09 <sup>h</sup> 40 <sup>m</sup>
31	-2.87	49”	-	19 <sup>h</sup> 29 <sup>m</sup>	01 <sup>h</sup> 31 <sup>m</sup>	07 <sup>h</sup> 28 <sup>m</sup>

## Saturn.

Low in the W evening twilight.

Rings slightly open.

Moon close on 12<sup>th</sup>/13<sup>th</sup>.

Excellent target for webcam imaging.

Date.	Mag.	Dia.	Phase.	Rise.	Transit.	Set.
01	+1.09	16”	-	09 <sup>h</sup> 16 <sup>m</sup>	15 <sup>h</sup> 27 <sup>m</sup>	21 <sup>h</sup> 38 <sup>m</sup>
31	+1.01	16”	-	07 <sup>h</sup> 36 <sup>m</sup>	13 <sup>h</sup> 41 <sup>m</sup>	19 <sup>h</sup> 45 <sup>m</sup>

Don’t forget to visit the Cassini mission websites at <http://saturn.jpl.nasa.gov> and <http://ciclops.org>

## Uranus.

Low in predawn skies about 2° E of Jupiter.

Moon close on 26<sup>th</sup>.

Date.	Mag.	Dia.	Phase.	Rise.	Transit.	Set.
01	+5.77	3.6”	-	21 <sup>h</sup> 21 <sup>m</sup>	03 <sup>h</sup> 25 <sup>m</sup>	09 <sup>h</sup> 24 <sup>m</sup>
31	+5.73	3.7”	-	19 <sup>h</sup> 22 <sup>m</sup>	01 <sup>h</sup> 24 <sup>m</sup>	07 <sup>h</sup> 21 <sup>m</sup>
-	-	-	-	-	-	-

## Neptune.

Opposition reached on 20<sup>th</sup>.

Moon close on 23<sup>rd</sup>.

Date.	Mag.	Dia.	Phase.	Rise.	Transit.	Set.
01	+7.83	2.4”	-	20 <sup>h</sup> 23 <sup>m</sup>	01 <sup>h</sup> 23 <sup>m</sup>	06 <sup>h</sup> 19 <sup>m</sup>
31	+7.83	2.4”	-	18 <sup>h</sup> 25 <sup>m</sup>	23 <sup>h</sup> 22 <sup>m</sup>	04 <sup>h</sup> 16 <sup>m</sup>

## **Dwarf Planets.**

### **Ceres.**

An 8<sup>th</sup> magnitude object in Ophiuchus low down in the evening sky.

### **Eris (2003 UB313).**

An “early hour” CCD target in Cetus.

### **Haumea.**

An early evening object located in Bootes. At magnitude +17 provides a target for CCD observers.

### **MakeMake.**

An early evening object located in Coma Berenices. At magnitude +17 provides a target for CCD observers.

### **Pluto.**

A 14<sup>th</sup> magnitude object located in the rich star fields of Sagittarius.

## **Asteroids.**

**Pallas (2).** A 10<sup>th</sup> magnitude object moving through Bootes SW of epsilon.  
See monthly periodicals/*BAA Handbook* for details of other asteroids.

## **Comets.**

No “bright” comets at present.

## **Meteor Showers.**

**Perseids.** Active until 20<sup>th</sup> with peak activity on 12<sup>th</sup> at 21<sup>h</sup> when ZHR = 80. No interference from moonlight so very favourable if skies are clear!

**τ Aquarids.** Active throughout August with peak on 6<sup>th</sup> when ZHR = 8.

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](http://www.spaceweather.com) for updates.

## **Eclipses.**

No phase visible from UK.

## 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).

All magnitudes are + unless otherwise shown.

### 2.1 Recent and Current Events.

### 2.2 Variable Stars.

**Beta ( $\beta$ ) Persei, Algol.** Range 2.2 to 3.4, period 2.7 days. Currently not well placed for evening observation. Better placed post midnight when favourable minima occur on 22<sup>d</sup> 2.3<sup>h</sup> and 24<sup>d</sup> 23.1<sup>h</sup>.

**Delta ( $\delta$ ) 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 ( $\mu$ ) 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.

**Epsilon ( $\epsilon$ ) Aurigae.** Eclipsing binary range +3.0 to +3.7, period 27 years. Fall from max to min and rise back to max takes almost 2 years. Minimum lasts almost a year. Currently undergoing its long eclipse so well worth monitoring. BAA Variable Star of the Year (2010).

### 2.3 Double Star(s) of the month.

**Beta Cygni = Albireo.** Orange + Blue. An absolute gem in small telescopes.

**Alpha Herculis = Rasalgethi.** Orange + Blue.

**Epsilon Lyrae.** The famous “Double- Double” star.

**Alpha Scorpii = Antares.** Red + Green. Requires steady seeing and best seen in larger apertures.

A project for the Deep Sky Project Group is to image a range of the more colourful double stars.

## 2.4 Double Stars/Star Clusters/Nebulae/Galaxies.

### Cygnus (Cyg).

$\beta$  Cyg, Albireo (3.2/5.4, separation. 34.3") ds. Marking the head of the swan this splendid double star consists of a yellow-orange star (3.2) and a bluish star (5.4) providing a beautiful contrast. Easily photographed.

61 Cygni (5.3/5.9, separation 28.4") ds. Worth locating as it holds the distinction of being the first star to have its distance, 3.4pc, measured. (Friedrich Bessel in 1838 using parallax).

NGC6826 (9.8) pn. This interesting planetary nebula is located about  $6^{\circ}$  north of  $\delta$ . Nicknamed the "Blinking Nebula" because when viewed directly only the central star (10.4) is seen, but, with averted vision the shell of the nebula springs into view and the central star appears to dim or disappear. Look back at the star and the shell disappears and the star "returns". Hence the blinking effect.

NGC6871 (5.2) oc. Lies in rich star fields of the Milky Way.

NGC6888 (11.0) snr. Southwest of M29 this is object provides a difficult visual challenge. Dark transparent skies are essential and a nebular filter will help. A good target for CCD imagers.

NGC6910 (7.4) oc. Fine open cluster.

NGC6913 (**M29**) (6.6) oc. Large scattered cluster of stars. Surrounding the M29 area and centred on  $\gamma$  Cyg is the vast emission nebula IC1318 which is separated by dark dust lanes into five major areas.

NGC6960/6979/6992-5 (7.0) snr. One of the most beautiful deep-sky objects can be found in the "east wing" of Cygnus. This is the "Veil/Filament nebula", a supernova remnant (SNR). Although it shows up well in photographs it can be frustratingly difficult to see visually, partly because of its large angular size. A dark, transparent sky is essential and the use of a UHC filter will pay rich rewards. The western "Filament" NGC6960 is located by the star 52 Cygni which should be identified first. Then sweep eastwards to locate the slightly brighter "Veil" NGC 6992-95. The central "wedge" NGC 6979 is rather faint but patience will reap rewards. Once the "Veil" and "Filament" have been recognized identification without a filter becomes easier although the view is less impressive. An 8" telescope with increasing magnification begins to reveal the delicate "lacy" structure. A small telescope using a low power wide-field eyepiece + filter reveals the complete circular outline which is some  $3^{\circ}$  across.

NGC7000 (4.5) en. From a dark site the ghostly glow of the "North American Nebula", may just be detected east of Deneb (1.3) by the unaided eye. It shows up well in photographs together with the adjacent IC5067/70, the "Pelican Nebula".

NGC7027 (10.4) en. Strange object identified as a star, then a planetary nebula and currently an emission nebula.

NGC7048 (11.3) pn.

NGC7092 (**M39**) (4.6) oc. Compact cluster of stars.

### Draco (Dra).

Alpha ( $\alpha$ ) Thuban. Although only a third magnitude object 5000 years ago Thuban held the distinction of being the Pole Star. Its designation alpha is strange as it is only the seventh brightest star in the constellation.

Mu ( $\mu$ ) ds. 5.6/5.7; separation 1.9". Pair of white stars.

Nu ( $\nu$ ) ds. 4.9/4.9; separation 61.9". Pair of bright white stars.

Psi ( $\psi$ ) ds. 4.9/6.1; separation 30.3". Pair of yellowish stars.

16 & 17 ds. 5.4/5.5; separation 90.3". Pair of bright white stars.

40 & 41 ds. 5.7/6.1; separation 19.3". Pair of pale yellow stars.

Struve ( $\Sigma$ ) 2155 ds. 6.8/10.1; separation 9.8". Pale yellow and blue pair.

## **Draco continued.**

NGC4236 (9.6) sg. Seen almost edge and low surface brightness makes it a test for moderate apertures.

NGC4319 (11.9) sg. Elongated haze with prominent core. A Quasar, Makarian 205 (14.5) lies 40" to the south.

NGC5866 (**M102**) lg. Elongated object. One of the missing Messier objects.

NGC5907 (10.3) sg. Thin needle of light. A fine edge-on galaxy.

NGC6503 (10.2) sg. Distinctly elongated.

NGC6543 (8.1) pn. The Cats Eye Nebula. Bright small disc with greenish tint. 11<sup>th</sup> magnitude central star. Draco's "Showpiece object".

## **Hercules (Her).**

Alpha ( $\alpha$ ) ds. 3.5/5.4 separation 4.7". Orange and blue. The primary is a semi regular variable 3.1 to 3.9 approx period 90 days.

Gamma ( $\gamma$ ) ds. 3.8/9.8; separation 41.6". Unequally bright pair of yellow stars. Part of a triple system.

Delta ( $\delta$ ) ds. 3.1/8.2 separation 8.9". White primary with bluish-purple secondary. Part of a multiple system.

Kappa ( $\kappa$ ) ds. 5.3/6.5; separation 28.4". Fine pair of yellow stars. Part of a triple system.

Mu ( $\mu$ ) ds. 3.4/10.1 separation 10.1". Yellow primary. Secondary 1" wide pair of red stars. Part of a quad system.

Rho ( $\rho$ ) ds. 4.6/5.6 separation 4.1". White pair. Part of a triple system.

56 Herculis ds. 6.1/10.6 separation 18.1". Fine contrasting orange and blue pair.

100 Herculis ds. 5.9/6.0 separation 14.2". Matched pair of white stars.

NGC6205 (**M13**) (5.9) gc. Arguably one of the outstanding objects in the northern hemisphere. Just visible to the naked eye from dark sites it appears as a fuzzy blob in binoculars. It stands high power well and the outer edges begin to resolve into individual stars in a 4" (100mm) telescope. Increasing aperture brings greater rewards. Lord Rosse and others using the 72" at Birr Castle in the 19th century observed three dark rifts radiating from the centre. Later visual observers confirmed these. However with the advent of photography the rifts disappeared. In the 1950's the late Walter Scott Houston in his "Sky and Telescope" column revised interest in the "propeller". Responses indicated that visibility of the rifts depended on a careful balance of aperture and magnification. Today a dark sky is probably a key factor.

NGC6207 (11.6) sg. 40" to the NE of M13 and in the same field as a low power widefield eyepiece. This moderately bright galaxy is often overlooked due to the spectacular blaze of the much closer globular cluster.

NGC6210 (9.3) pn. Located about 4<sup>o</sup> NE of  $\square$  Her.

NGC6229 (9.4) gc. Located about 7<sup>o</sup> NW of M13.

NGC6341 (**M92**) (6.5) gc. Slightly fainter and smaller than M13 this globular cluster deserves equal attention. it starts to resolve in a 6" telescope at high power and becomes increasingly impressive with increased aperture.

The area around M13 contains a number of faint galaxies requiring a large (12"+) telescope to explore. Identity of the objects can prove interesting as some are wrongly labelled on some charts and catalogues.

Abell 2151. The Hercules Galaxy Cluster.

## Lyra (Lyr).

Alpha ( $\alpha$ ) Lyr Vega (0.04). The fifth brightest star (Sun excluded) in the sky is worth mentioning as due to the effects of precession Vega will hold the distinction of being the pole-star in about 12,000 years time. Infrared studies indicate that it may be surrounded by a disc of planetary forming material.

Delta ( $\delta$ ) ds. 4.5/5.5 separation 10.5" ds. Comprises bluish-white and ruddy orange components. One of the finest double stars for small telescopes.

Epsilon ( $\epsilon$ ) ds/ds. 5.5/6.5 separation 2.8"; 5.0/5.5 separation 2.2". The two pairs are separated by 208". The famous "double-double" star. Splitting the image into the four components with a small telescope provides a good indication of seeing conditions.

Struve ( $\Sigma$ ) 2470 + 2474 ds/ds. 6.6/8.6 separation 13.4"; 6.7/8.8 separation 16.2". White and blue-white pair together with a pair of pale yellow stars. Lyra's other "double-double".

13-R Lyrae vs. 3.8 to 5.0, period 46 days. Fine red-orange semi-regular variable star well suited for binoculars and small telescopes.

NGC6702 (12.2) eg. Diffuse halo with slight central brightening. Locate NGC6703 and move 12' NNW.

NGC6703 (11.4) lg. Located in the northern reaches of Lyra.

NGC6710 (12.8) lg. Located on the southern borders of Lyra.

NGC6720 (**M57**) (9.7) pn. The famous "Ring Nebula" appears as a ghostly smoke ring. Visible as a faint out of focus star M57 at low power it is best seen in telescopes responding well to high powers. The use of filters, UHC and/or OIII, improve contrast. The magnitude 14.8 central star is unlikely to be seen without a large telescope.

NGC6779 (**M56**) (8.2) gc. Often overlooked this globular cluster is located about halfway between  $\beta$  and  $\lambda$  on the borders of the rich star fields of the Milky Way.

NGC6791 (9.5) oc. Requires medium to large telescopes to begin to resolve into individual stars the brightest of which are 13th magnitude.

## Ophiuchus (Oph).

Barnard's Star. (9.5). Located at R.A. 17h 58m Dec. +04° 41m. A red dwarf with the largest proper motion of any star in the sky.

Lambda ( $\lambda$ ) ds. 4.2/5.2 separation 1.5". White and pale yellow pair. Part of a quadruple system.

Omicron ( $\omicron$ ) ds. 5.4/6.9 separation 10.3". Fine contrasting pair of orange and yellow stars.

Rho ( $\rho$ ) ds. 5.3/6.0 separation 3.1". Close pair of blue stars.

NGC6171 (**M107**) (8.1) gc. Granular texture with brighter core in small apertures.

NGC6218 (**M12**) (6.6) gc. Outer reaches resolved in medium apertures showing with a small core.

NGC6254 (**M10**) (6.6) gc. Granular halo with bright core. Outer reaches resolved in small apertures.

NGC6266 (**M62**) (6.7) gc. Bright off centre core with fainter halo.

NGC6273 (**M19**) (7.1) gc. Small bright globular. Outer reaches begin to resolve in small apertures.

NGC6333 (**M9**) (7.9) gc. Large bright core. Nearby is the dark nebula Barnard 64.

NGC6356 (8.4) gc. Requires large apertures to resolve.

NGC6402 (**M14**) (7.6) gc. Requires large aperture to resolve. The most distant of the Messier gc's.

NGC6572 (8.1) pn. Fine bright greenish object.

NGC6633 (4.6) oc. Large, bright but loose open cluster well suited for small aperture.

### **Sagitta (Sge).**

NGC6838 (M71) (8.3) gc. Almost lost in the foreground stars of the Milky Way. A relatively poor globular which for a time was considered to be a rich open cluster. It is a young cluster containing "metal" rich stars.

### **Sagittarius (Sgr).**

Sagittarius contains many fine objects unfortunately not well seen from our latitudes. The Galaxy centre lies in this direction obscured by intervening stars, gas and dust.

M24 (4.5) originally thought to be an open cluster is now classed as a star-cloud.

NGC6494 (M23) (5.5) oc

NGC6514 (M20) (6.3) en & rn. The "Trifid Nebula"

NGC6523 (M8) (5.8) en. the "Lagoon Nebula".

NGC6531 (M21) (5.9) oc,

NGC6618 (M17) (6.0) the "Omega Nebula",

NGC6626 (M28) (6.9) gc,

NGC6637 (M69) (7.7) gc

NGC6656 (M22) (5.1) gc

NGC6681 (M70) (8.1) gc.

NGC6715 (M54) (7.7) gc,

NGC6809 (M55) (6.9) gc,

NGC6864 (M75) (8.6) gc.

IC4725 (M25) (4.6) oc.

### **Scorpius (Sco).**

Alpha ( $\alpha$ ) Antares ds. 1.2/5.4 separation 2.9". Red-orange primary with fainter greenish companion. Difficult to split requiring very good seeing conditions.

Beta ( $\beta$ ) ds. 2.6/4.9 separation 13.6". Blue-white primary with pale blue companion. Fine object for small telescopes.

Nu ( $\nu$ ) 4.3/6.8 separation 2.3" ds. Pair of white stars requiring good seeing conditions to split.

NGC6093 (M80) (7.2) gc. Fine object unfortunately not well seen from the UK.

NGC6121 (M4) (5.9) Fine globular unfortunately not well seen from the UK.

NGC6405 (M6) (4.2) oc. Unfortunately it briefly creeps above the southern horizon making it very difficult to observe from the UK.

NGC6475 (M7) (3.3) oc. Another fine object that unfortunately briefly creeps above the southern horizon making it very difficult to observe from the UK.

### **Scutum (Sct).**

Contains a brighter part of the Milky Way known as the "Scutum Star-cloud".

NGC6705 (M11) (5.8) oc. The "Wild Duck" is a fine sight in telescopes and is easily located in binoculars.

NGC6694 (M26) (8.0) oc. Fainter than M11 but easily located.

### **Serpens Cauda (SerCd).**

Nu ( $\nu$ ) ds. 4.3/8.3 separation 46.3". Wide pair of green and pale blue stars.

Struve ( $\Sigma$ ) 2303 ds. 6.6/9.1 separation 2.1". Good optical test for small instruments.

Theta ( $\theta$ ) ds. 4.6/5.0 separation 22.3". Bluish-white pair of stars suitable for binoculars.

NGC6611 (M16) (6.0) oc & en. Bordering naked eye visibility this nebula and its associated star cluster forms one of the most well known HST images - "Pillars of Creation".

### **Ursa Minor (UMI).**

This faint constellation lies between Ursa Major and  $\alpha$  UMi, Polaris the Pole Star. They form the shape of a small kite complete with a tail. Polaris marks the end of the tail.

Eta ( $\eta$ ) at magnitude 4.9 is often used as a convenient test of sky conditions.

Alpha ( $\alpha$ ) Polaris ds. 2.0/8.2; separation 18.4".

Pi-1 ( $\pi^1$ ) ds. 6.6/7.3; separation 31.1". Yellow primary with white companion.

h (Herschel) 2682 ts. 6.7/9.7; separation 26.3". White primary with two blue companions.

### **Vulpecula (Vul).**

Collinder 399 (3.6) oc. Aptly named the "Coat-hanger" this cluster is visible to the naked eye as a hazy patch. A fine site in binoculars.

NGC 6853 (M27) (7.6) pn. The "Dumbbell Nebula", is easily seen in binoculars. The "dumbbell" shape becomes more recognizable in telescopes with increasing magnification. In common with other planetary nebulae it responds well to filters especially the OIII type.

P.V.H.