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

February 2012.

Forthcoming Meetings.

BAA meetings.
Full details of BAA meetings at: www.britastro.org

Friday & Saturday 10th – 11th February.
"European Astrofest 2012".
Kensington Conference & Events Centre, London.
A few minutes walk from High Street Kensington Underground Station.
Full Details at: www.astronomynow.com/astrofest and the current issue of *Astronomy Now.*

Sunday 26th February.
Bedford A.S. 25th Anniversary Event.
Bedford School,
De Parys Avenue,
Bedford MK40 2TU
6 Guest Speakers.
Admission:
£10 including lunch& refreshments – Must be booked in advance!
£6 including refreshments.
See website www.bedsastro.org.uk for full details.

Highlights of the Month.

Mercury reappears low in SW evening skies during the last week of the month.
Venus very prominent in the W to SW evening skies.
Mars becoming prominent in the mid evening E skies.
Jupiter well placed for evening observation.
Saturn well placed for "early hour" observation.
3rd/4th Comet Garradd very close to M92 in Hercules.
9th Conjunction Venus and Uranus.
20th Try locating the very thin crescent Moon low in the ESE **before sunrise**.
22nd More difficult try locating the very thin crescent Moon low in the W **after sunrise**. It is also in conjunction with Mercury about 5° to the E.
24th Conjunction Moon and Uranus.
25th Close conjunction Moon and Venus.
26th/27th Conjunction Moon and Jupiter.
Try spotting the Moon, Mercury, Venus, Uranus and Jupiter on the same evening between 22nd and 27th. Later on these evenings locate Mars and Saturn. A pity Neptune is lost in the evening twilight or you could bag the whole set in less than six hours!
Try spotting Venus in daylight with the naked when it is close to the Moon on 25th.
Try spotting Jupiter in daylight with binoculars when it is close to the Moon on 27th.

Recent Events.

The Quadrantids meteor shower put on a good show for early risers and the skies were clear around peak activity!

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.

2012 is a Leap Year so make the most of 29th February!

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

Date.	Rise.	Transit.	Set.
01	$07^h\ 45^m$	$12^h\ 15^m$	$16^h\ 45^m$
08	$07^h\ 33^m$	$12^h\ 15^m$	$16^h\ 58^m$
15	$07^h\ 20^m$	$12^h\ 15^m$	$17^h\ 11^m$
22	$07^h\ 06^m$	$12^h\ 15^m$	$17^h\ 24^m$
29	$06^h\ 50^m$	$12^h\ 14^m$	$17^h\ 38^m$

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.

Keep in touch with the **S**olar **D**ynamics **O**bservatory satellite at http://sdo.gsfc.nasa.gov/

Long hours of darkness increase 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.

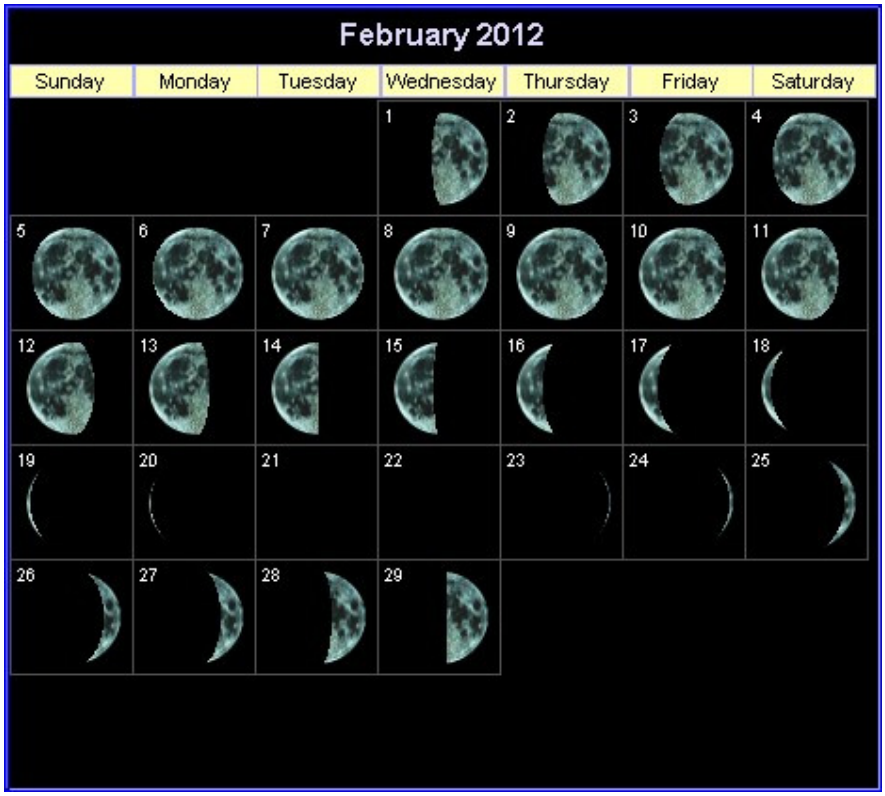
Add the "Spaceweather" and the "Soho Lasco C3" websites to your "favourite" websites.

Moon.

Phases:

Full	$07^{d}\ 21^{h}\ 54^{m}$
Last quarter	$14^{d}\ 17^{h}\ 04^{m}$
New	$21^{d}\ 22^{h}\ 35^{m}$
First quarter	No First Quarter in February.

When did the absence of a major phase last occur?



Produced using LunarPhase Pro.

Apsides:

Perigee	$11^{d}\ 19^{h}$	Diameter. 32’ 29”	Distance. 367,926km.
Apogee	$27^{d}\ 14^{h}$	Diameter. 29’ 31”	Distance. 404,323km.

For northern observers:
The waxing crescent Moon is well placed.
The waxing gibbous Moon is very well placed.
The Full Moon is well placed.
The waning gibbous Moon is becoming less well placed.
The waning crescent Moon is less well placed.
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.

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.

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

A Challenge!
On 20th try locating the very thin (3% lit) crescent Moon very low in the ESE from about 06:40 **before sunrise**.
On 22nd try locating the very thin (1% lit) crescent Moon very low in the W just **after sunset**.

If you can grab images of the above so much the better.

The Planets.

Mercury.

Superior conjunction on 7th.
Reappears low in WSW after sunset during the last week of the month.
Moon close on 22nd = photo opportunity.

Date.	Mag.	Dia.	Phase.	Rise.	Transit.	Set.
22	-1.2	5.5"	0.89	$07^h\ 31^m$	$13^h\ 02^m$	$18^h\ 34^m$
29	-0.9	6.4"	0.68	$07^h\ 14^m$	$13^h\ 16^m$	$19^h\ 18^m$

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

Venus.

Brilliant object in SW to WSW evening sky. Easy to spot in daylight – use Moon as a guide on 25th.
Close Conjunction with Uranus on 9th (1/2° W of Uranus) = photo opportunity.
Moon close on 25th = photo opportunity.

Date.	Mag.	Dia.	Phase.	Rise.	Transit.	Set.
01	-4.1	15"	0.74	$09^h\ 05^m$	$14^h\ 49^m$	$20^h\ 33^m$
29	-4.2	18"	0.64	$07^h\ 58^m$	$14^h\ 56^m$	$21^h\ 55^m$

Mars.

Becoming prominent in the mid evening E sky and well placed for observation from mid evening to dawn.
Reaches opposition on 3rd March.
Moon close on 9th.

Date.	Mag.	Dia.	Phase.	Rise.	Transit.	Set.
01	-0.6	12.0"	0.96	$20^h\ 17^m$	$02^h\ 57^m$	$09^h\ 33^m$
29	-1.2	14.0"	1.0	$17^h\ 41^m$	$00^h\ 40^m$	$07^h\ 34^m$

The **Opportunity** rover continues its exploration. Visit the appropriate website for updates.

Jupiter.

Dominates the evening skies.
Setting before midnight.
Moon close on 26th/27th = photo opportunities.
See BAA *Handbook* and/or monthly periodicals for satellite phenomena.
Excellent target for webcam imaging.

Date.	Mag.	Dia.	Phase.	Rise.	Transit.	Set.
01	-2.3	39”	-	$10^h\ 16^m$	$17^h\ 19^m$	$00^h\ 26^m$
29	-2.2	36”	-	$08^h\ 34^m$	$15^h\ 45^m$	$22^h\ 58^m$

Saturn.

Gaining height in the SE dark morning skies.
Moon close on 12th/13th.
Excellent target for webcam imaging.

Date.	Mag.	Dia.	Phase.	Rise.	Transit.	Set.
01	+0.6	18”	-	$23^h\ 51^m$	$05^h\ 11^m$	$10^h\ 27^m$
29	+0.4	18”	-	$21^h\ 57^m$	$03^h\ 20^m$	$08^h\ 38^m$

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

Uranus.

Well placed for early evening observation.
Close Conjunction with Venus on 9th (1/2° E of Venus) = photo opportunity.
Moon close on 23rd/24th.

Date.	Mag.	Dia.	Phase.	Rise.	Transit.	Set.
01	+5.9	3.4”	-	$09^h\ 21^m$	$15^h\ 24^m$	$21^h\ 27^m$
29	+5.9	3.4”	-	$07^h\ 32^m$	$13^h\ 39^m$	$19^h\ 45^m$

Neptune.

Lost in the SW evening twilight.

Date.	Mag.	Dia.	Phase.	Rise.	Transit.	Set.
01	+8.0	2.2”	-	$08^h\ 26^m$	$13^h\ 25^m$	$18^h\ 24^m$
29	+8.0	2.2”	-	$06^h\ 38^m$	$11^h\ 39^m$	$16^h\ 41^m$

Dwarf Planets.

Ceres.
An early evening object low down in W Cetus.
Eris (2003 UB313).
An early evening CCD target located in Cetus.
Haumea.
A morning CCD target located in Bootes.
MakeMake.
A late evening and morning CCD target in Coma Berenices.
Pluto.
Not observable in the morning twilight.

Asteroids.

Hebe (6). Located in Leo. Mag +9.4 when at opposition on 25th.

Eros (433). Classed as a **N**ear **E**arth **O**bject it is close to Earth at the beginning of the month. Moves S through Sextans into Hydra during the month. Well worth a series of images.

See monthly periodicals/*BAA Handbook* for details of other asteroids.

Comets.

C/2009 P1 Garradd. A mag +6.5 object now observable in the NE "early hours" and E predawn skies. Well placed for N observers as it continues to slowly track northwards through northern Hercules and into Draco during the month. On 2nd to 4th it passes close to the globular cluster M92 (+6.5) giving excellent imaging opportunities if clear. On 19th it passes just E of the star HIP81437 (+5.25) in Draco. On 23rd/24th it passes midway between eta (+2.7) and theta Dra (+4.0). Well worth the "early rise" to follow and image.

Meteor Showers.

No major showers this month.

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 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).
All magnitudes are + unless otherwise shown.

2.1 Variable Stars of the month.

Beta (β) Persei, Algol. Range 2.2 to 3.4, period 2.7 days. Well placed for observation. Favourable minima (at social hours) occur on 15^d 0.6^h, 17^d 21.4^h and 20^d 18.2^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.

Omicron (ο) Ceti, Mira. The classic long period variable star. Still naked eye but fading. Well placed for mid-evening through midnight observation.

U Ori. Follow its slow rise from min (+12.0) (last Oct) to max (+6.3) in Mar 2012.

2.2 Double Stars of the month.

Aur. See notes below.
h (Herschel) 3945 CMa. See notes below.
Alpha Gem (Castor). See notes below.
Gamma Lep. See notes below.
12 Lyn. See notes below.
38 Lyn. See notes below.
Beta Mon. See notes below.
k Mon. (Not to be confused with κ). See notes below.
Beta Ori (Rigel). See notes below.
Sigma Ori. See notes below.
Theta-1 Ori (The Trapezeium). See notes below.
k Pup. (Not to be confused with κ). See notes below.

A project for the OUAC Deep Sky Project Group is to image (especially the more colourful) and measure a range of the double stars.

2.3 Constellations in close-up.

Auriga (Aur).

NGC1960 (**M36**) (6.0) oc. Large bright grouping. In same low power field as M38.
NGC2099 (**M37**) (5.6) oc. Richest and brightest of the three Messier star clusters in Auriga. At 150 stars brighter than 12th magnitude.
NGC1912 (**M38**) (6.4) oc. Larger than M36. Many bright stars arranged in pairs. The above are excellent objects for photography. Guided exposures of a few minutes will be necessary. CCD images require much shorter exposures.
NGC1664 (7.6) oc. Fine cluster on the border of Auriga and Perseus.
NGC1778 (7.7) oc. A 6" telescope will show about 20 stars. Larger apertures will reveal more.
NGC1857 (7.0) oc. Hazy patch surrounding an orange 7th magnitude star which interferes with viewing the fainter stars.
NGC1893 (7.5) oc. Fine, though rather sparse cluster. 8"+ telescopes under dark skies may begin to reveal the pale light of the brightest part of the emission nebula IC410 which pervades the star cluster.
NGC1907 (8.2) oc. This small cluster lies just west of M38 appearing as a small smudge of light.
NGC1931 (11.3) en. An 8" telescopes from dark skies should reveal this small pea-nut shaped emission nebula.
NGC 2192 (10.9) oc. Not an easy object probably requiring a 6" telescope to locate and 10"+ to resolve.
NGC2281 (5.4) oc. Handful of stars often overlooked.
IC405 en (6v) The "Flaming Star Nebula". Illuminated by the star AE Aur which is a "runaway star" whose path can be traced back to Orion. At present the star is passing by/through the normally dark dust and gas cloud of IC405 and thus illuminating it. In the future as AE moves away the nebula will again become dark.

Canis Major (CMa).

Alpha (α) Sirius (-1.5). The brightest star in the sky the Sun and supernova and nova excepted. Sirius has a fascinating magnitude 8.5 companion discovered in 1862 by Alvan G. Clark when testing a new 18.5 inch refractor, nicknamed "The Pup", and subsequently identified as an object now called a white dwarf. These stars are the final stages of Sun-like stars that have exhausted their supply of nuclear fuel and have collapsed to form a dense object which will gradually cool and fade from view to become a cosmic cinder. More massive stars follow a different path by "exploding" in an event called a supernova that leave behind even more dense compact objects - neutron stars or black holes. Because of its close separation and glare from Sirius the "Pup" provides a challenge for keen amateurs under favourable conditions.
Pi (π) ds. (4.7/9.7. sep. 11.6”). Yellow-white primary with bluish secondary.
Mu (u) ds. (5.3/8.6 sep. 3.0”). Striking contrast of deep yellow primary with blue secondary.
Tau (t) ds. (4.4/10.5 sep. 8.2”). Pale yellow primary with pale blue secondary. Part of a multiple system set in a rich field of stars.
17 ts. (5.8/9.3, sep. 44.4”). White primary with two orangish companions. Part of a multiple system.
Herschel (h) 3945 ds. (4.8/6.8, sep. 26.6”). Superb Orange and blue pair in the same league as Albireo in Cygnus and Almach in Andromeda.!
NGC2287 **(M41)** +4.5 oc. A fine open cluster located about 5^{o} south of Sirius. It would be easily visible to the naked eye if it reached greater altitude in our skies.
NGC 2345 (7.7) oc. Large loose irregular cluster.
NGC 2354 (6.5) oc. Loose irregular cluster set in a rich star field.
NGC 2362 (4.1) oc. Rich compact cluster surrounding Tau..

Canis Major continued.

NGC 2383 (8.4) oc.
NGC 2207(10.7) sg. Elongated with bright core. Interacting with IC2163 visible as a faint smudge on E edge of 2207.
NGC 2217(10.4) sg. Fairly round with slightly brighter centre situated in a rich star field.

Canis Minor (CMi).

Alpha (α) Procyon (0.4) has a fascinating companion (12.9) which is white dwarf star. Spotting the companion presents amateurs with a difficult challenge under favourable conditions.
Struve (Σ) 1103 ds. (7.7/9.2, sep. 4.4”). Pale yellow primary with pale blue companion.
Struve (Σ) 1149 ds. (7.9/9.6, sep. 21.7”). Fine pair of pale yellow and pale blue stars.
NGC2470 sg. (12.7). Elongated with bright core.
Canis Major.

Gemini (Gem).

Alpha (α) **Castor** ms. 1.9/2.9 sep 4.0”. Close visual pair. However each of these is a spectroscopic binary. A more distant ninth magnitude star (red) forms part of an eclipsing binary system. A fascinating family!
Delta (δ) ds. 3.5/8.2 sep 5.8”. Yellow primary with bluish secondary.
Kappa (κ) ds. 3.6/8.1 sep 7.1”. Orange-yellow primary with bluish companion.
Lambda (λ) ds. 3.6/10.7 sep 9.6”. Blue-white primary with bluish companion.
Σ1108 (Struve) ds. 6.6/8.3 sep 11..5”. Yellow primary with bluish companion.
M35 (5.1) oc. Just visible to the naked eye from dark sites. It is a superb object in telescopes. On its western edge lies the more distant open star cluster IC2158.
NGC2129 (10.2) oc. Located about a degree SW of IC2158.
NGC2266 (9.5) oc. Located about two degrees north of ε Gem.
NGC2392 (10.5) pn. The "Eskimo nebula" is a fine planetary nebula located about two degrees SE of δ. The nickname is derived from the appearance of a face surrounded by the hood of a parka.
NGC2420 (8.3) oc. Located about two degrees east of the "Eskimo".
Complete this deep-sky tour of Gemini by locating the open star clusters NGC2355 (9.7) and NGC2395 (7.1).

Lepus (Lep).

Lying beneath Orion Lepus is easily recognized by a quadrilateral of four third magnitude stars and contains a variety of deep-sky objects including one Messier object.
Alpha (α) ds; (2.6,11.1; sep. 35.8").
Beta (β) ds; (3.0/7.5; sep. 2.3").
Gamma (γ) ds. (3.7/6.3, sep. 96.3”). Fine yellow and pale orange pair.
Kappa (κ) ds; (4.5/7.4; sep. 2.6"). White and blue companions.
Iota (ι) ds; (4.5/10.8; sep. 12.7").
NGC1974 sg (11.8). Seen almost edge on.
NGC1904 (**M79**) gc (8.0). A fine globular cluster visible as a fuzzy spot in binoculars. Outer edges begin to resolve in 12" (30cm) telescopes.
IC418 pn (10.7). Very small but bright. Central 10.7 mag star surrounded by pale ring. Use a UHC or OIII filter for best results.

Lynx (Lyn).

5. ds. 5.3/9.8; sep 31.4". Fine yellow and blue pair.
12. ts. 5.4/6.0/7.1; sep 1.7", 9". Fine trio of white stars.
19. ds. 5.6/6.5; sep 14.8". Fine pale yellow and pale blue pair forming part of a quadruple system. The C (10.9) component lies 74" to the WNW of B. The D component (8.9) lies 215" N of AB.
38. ds. 3.9/6.6; sep 2.7". Fine contrasting white and "rust" coloured pair.

NGC2419 (10.5) gc. Located about 7º north of Castor (α Gemini) this globular cluster at first appears rather uninspiring. At a distance of 300,000 light years it is one of the most distant objects of its class. Because of its great distance, almost twice that of the Large Magellanic Cloud, it was dubbed the "Intergalactic Tramp" by the eminent astronomer Harlow Shapley.
NGC2683 (9.7) sg. A fine nearly edge-on spiral galaxy located on the borders of Lynx and Cancer about 5º west of α Lyn.

Monoceros (Mon).

This faint and rather indistinct constellation is located between Orion and Canis Minor.
Beta (β) ts. 4.7/5.2/6.1 Sep. AB = 7.3', sep BC = 2.8". Striking triple of bluish white stars.
Epsilon (ε) ts. 4.5/6.5 sep. 13.4". Close pair of pale yellow stars. The third mag 12.7 bluish white member is visible in 12"+ apertures.
NGC2244 oc (4.8). Fine open star cluster surrounded by NGC2237-9 "The Rosette Nebula" which is best seen using a UHC filter. Shows well in photographs.

NGC2261 en (10v). "Hubble's Variable Nebula". Located about 2º southwest of NGC2264 this a fascinating object and well worth monitoring for changes in shape and brightness due to the enveloped variable star R Monocerotis. The triangular wedge appears is almost comet like. Detailed star chart available for telescope owners.
NGC2264 oc + en (4.0) The "Christmas Tree Cluster". A fine open cluster with associated nebula that includes the "Cone Nebula".
NGC2323 (**M50**) oc (5.9). Superb open cluster.
There are many other open clusters in this area of the Milky Way - NGC's 2215(8.4), 2286(7.5), 2301(6.0), 2335(7.2), 2343(6.7), 2353(7.1) and 2506(7.6).

Orion (Ori).

This constellation dominates the winter skies and because it is so easily recognized forms one of the "key constellations" for finding other winter groupings.
Orion's two brightest stars provide a marked contrast. Betelgeuse is distinctly orange in colour. It is a red giant star entering old age. Rigel is a brilliant blue/white star indicating the exuberance of youth. Betelgeuse is slightly variable in brightness, range 0.1 - 0.9 and bears the designation α (alpha) indicating that it was brighter than Rigel, β (beta) (0.1), when stars were given these designations. Rigel is now the brighter of the two so either early magnitude estimates were wrong or Betelgeuse has dimmed slightly.
Beta Rigel (β) ds. 0.1/6.8 sep. 9.5". Brilliant bluish white primary with much fainter bluish secondary.
Eta (η) ds. 3.6/5.0 sep. 1.5". Close pair of white stars.
Delta (δ) ds. 2.0/6.9 sep. 52.6". Blue white primary with pale blue secondary.
Lambda (λ) ds. 3.5/5.6 sep.4.4". White stars. Part of a quadruple system.
Theta-1 (θ) ms. "The Trapezium". AB: 6.7/7.9 sep. 8.8"; CD: 5.1/6.7 sep. 13.4". Superb object!
Iota (ι) ts. 2.8/7.3 sep. 11.3". White primary with pale blue secondary. The third reddish 11th magnitude component is located 50" away.
Sigma (σ) ms. 4.0/10.3 sep. 11.4

Zeta (ζ) ds. 1.9/4.0 sep. 2.3". Bluish white stars. Part of a triple sysytem.

Orion continued.

NGC1976 (**M42**) (en). One of the most famous objects in the sky. Marking Orion's sword the "Great Orion Nebula" is visible to the naked eye as a faint misty patch. A pair of binoculars or small telescope will begin to reveal detail. Increasing aperture and low power bring increasing rewards for the visual observer. Embedded in the nebula is **Theta (θ^1) Ori**. A group of four young stars, mags 5.4,6.3, 6.8 and 7.0, aptly called "The Trapezium". The whole nebula is a stellar nursery with spectacular images being obtained from large Earth based telescopes and the Hubble Space Telescope. M42 is an ideal target for photography.

NGC1982 (**M43**) (en). A small patch of nebulosity on the northern edge of M42.

NGC2024 (en), nicknamed "the Flame Nebula", surrounds ζ Ori.

IC434 en is a strip of nebulosity just south of ζ. The famous "Horse's Head Nebula" (Barnard 33) is a small dark intrusion seen dramatically in photographs. It provides one of the biggest challenges to visual observers requiring very dark transparent skies. Responds well to a H-beta nebula filter.

NGC2068 (**M78**) (8.0)(rn) is a small patch of nebulosity about two degrees NNE of ζ.

NGC2112 (9.1)(oc) is an open star cluster about two degrees east of M78.

Other open clusters worth locating are NGC2186 (8.7), NGC2169 (5.9) and NGC2175 (6.8) which superimposes a small patch of nebulosity NGC2174.

Long exposure photographs reveal a long arc of nebulosity curving up the east side Orion. This is called "Barnard's Loop" which is extremely difficult to discern visually almost regardless of aperture. Remarkably it has been seen with the naked eye (initially by accident!) from dark sites using O III or UHC filters. The "Loop" is a faint ring of hot gas some 14^o by 10^o with the western part of the ring being less distinct. The "ring" may be due to radiation pressure from the hot young stars in the region of Orion's belt/sword acting on interstellar material. A less favoured school of thought is that it may be a supernova remnant.

Puppis (Pup).

The Milky Way passes through this faint constellation presenting fine star fields and many open star clusters including three Messier objects for your collection.

Sigma (σ) ds. (3.3/9.4, sep. 22.3"). Fine unequal pair of orange and yellow stars.

Herschel (h) 4038 ds. (5.5/8.5, sep. 27.0"). Pale yellow primary with reddish secondary.

Herschel (h) 4046 ds. (6.0/8.4, sep. 22.1"). Gold primary with white secondary set a rich star field.

k ds. (4.5/4.7, sep. 9.9"). Fine pair of blue-white stars. (Not to be confused with κ).

NGC2437 (**M46**) (6.1) oc. Contains the planetary nebula NGC2438(10.5). It is a foreground object and not a genuine member of the cluster.

NGC2422 (**M47**) (4.4) oc. Large and bright. A fine object not best seen from the UK..

NGC2447(**M93**) (6.2) oc. Another fine object not well seen from the UK.

Setting limits of magnitude 10.5 and declination -25^o try locating the following open clusters: NGC's 2421(8.3), 2423(6.7), 2432(10.2), 2455(10.2), 2479(9.6), 2482(7.3), 2509(9.3), 2539(6.5) and Mel 71(7.1).

P.V.H.