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

June 2006.

1. Solar system.

Note that all times shown are UT, remember to adjust for BST as necessary.

Earth.

Summer Solstice (Northern Hemisphere) on 21st June at 12h 26m.

From late May to July it is worth scanning the northwestern and northern deepening twilight sky for the appearance of **Noctilucent Clouds**. These form at high altitude (80km) and appear as luminous bluish clouds well worth capturing on camera.

Meetings.

Saturday 24th June 11:00 – 17:00. BAA Exhibition Meeting. Cavendish Laboratory, Madingley Road, Cambridge. Ordinary Meeting at 14:30 includes Martin Mobberley’s “Sky Notes” for the very last time. Worth the trip for this item alone!

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.

Although approaching the minimum of the current solar cycle it is always worthwhile to carry out regular observations for activity. See www.spaceweather.com for up to date information of solar activity and related events. Short hours of darkness limit the opportunity for observing aurora.

Moon.

Phases:

First quarter	03^{d}	23^{h}	06^{m}
Full	11^{d}	18^{h}	03^{m}
Last quarter	18^{d}	14^{h}	08^{m}
New	25^{d}	16^{h}	37^{m}

Apsides:

Apogee	04^{d}	02^{h}	Diameter.	29’	34”	Distance. 404,081km.
Perigee	16^{d}	17^{h}	Diameter.	32’	24”	Distance. 368,923km.

Moon continued.

Following the New Moon on the 25th try locating the very thin crescent the following evening. The few days following the New Moon provide an excellent opportunity to explore the terminator of the slowly waxing crescent where the low angle of the Sun (sunrise on the Moon) highlights lunar topography. A basic lunar map is all you need to get started. Sky & Telescopes "Lunar 100" card is also a useful guide for the novice. 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 of the Moon unless otherwise stated. Enter details in your observing log.

Predictions are for Greenwich, (E $0^{o}.0$, N $51^{o}.5$) from the *BAA Handbook 2005*.

Date.	ZC No.	Mag.	Time.

No suitable "bright events" this month.

Mercury.

A favourable apparition in the NW evening twilit sky. Magnitude –0.6, diameter 5.5", phase 0.74 on 4th fading to +1.3, diameter 9.6", phase 0.24 on the 29th. Greatest elongation E (25^{o}) is reached on the 20th.

Venus.

At magnitude –3.8 Venus should be easily spotted in the E dawn skies. The diameter decreases from 13.8" (phase 0.74) to 12.5" (phase 0.83) during the month. Rather a bland object for some months to come.

Mars.

Now sinking into the NW evening twilight. Moderately bright at +1.8, diameter about 4", phase 0.95. Moving through Cancer its path takes it in front of the star cluster M44 Praesepe on 15-16. On the 17th – 18th Mars will be half a degree north of Saturn A couple of excellent photo opportunities although the background sky will not be really dark. The small disc will now require larger aperture telescopes to observe surface detail.

Jupiter.

A month past opposition Jupiter dominates the evening sky after sunset and provides the opportunity for nightlong observation. Brilliant at magnitude –2.4, diameter 43.4", fading to –2.3, diameter 41" at the end of the month. Try locating the new "Little Red Spot". The current low declination will adversely affect seeing conditions for observers in the northern hemisphere. Jupiter is an excellent target for Webcam imaging. See separate observing sheet for Jupiter and Saturn.

Saturn.
Sinking into the NW twilight Saturn will soon be lost to view. Magnitude +0.4, diameter 17.1" shrinking to 16.7" during the month. Saturn is an excellent target for Webcam imaging. See separate observing sheet.
The Cassini spaceprobe continues to return staggering images and data of the planet and its extensive satellite system. The NASA website warrants a daily visit at: http://saturn.jpl.nasa.gov and http://ciclops.org

Uranus.
A morning 6th magnitude object located in Aquarius.

Neptune.
A morning 8th magnitude object located in Capricornus.

Pluto.
A 14th magnitude object located in Serpens Cauda. Opposition is reaches on 16th June. It will require a large aperture telescope to observe visually. Good CCD target.

Asteroids.
The following asteroid can be located with binoculars and small telescopes using a suitable star chart.
Pallas (2). Reaches opposition on the 30th when it will be magnitude 9.5 located in Hercules.
See monthly periodicals/*BAA Handbook* for details of other asteroids.

Comets.
No bright comets at present. See BAA Comet Section webpage www.ast.cam.ac.uk/-jds for updates and data for other comets.

Meteor Showers.
No major showers for northern observers.
Don't forget sporadic events and the chance of a brilliant fireball. The latter should be recorded and reported.

Eclipses.
No eclipses this month.

Observing Jupiter & Saturn.

Keep for future reference.

Jupiter. The disc appears distinctly flattened - equatorial diameter greater than the polar diameter. The equatorial bulge is due to Jupiter's very rapid rotation of under 10 hours. Even a short observing session of half an hour will show the rapid rotation of surface features. The main cloud belts are easily seen in small telescopes and with increasing aperture and magnification more and more detail is revealed, subject to atmospheric conditions. Watch for the Great Red Spot, smaller white spots, belt detail, satellite shadows etc. Use as high a magnification as seeing conditions allow. The use of coloured filters can enhance features. Try a selection and you will be surprised at their effect.
Following the ever-changing pattern of the four Galilean satellites - Io, Europa, Callisto and Ganymede - is a fascinating exercise over a few hours and subsequent evenings. Plot your observations on a sheet of graph paper and you will produce their orbital patterns. Identifying each of the satellites is straight forward using charts such as those printed in the *BAA Handbook* or periodicals such as *Astronomy Now, Sky and Telescope*, etc.

Saturn. The Cassini division in the rings should be easily seen. Moderate apertures and high power may reveal the Encke division and the dusky Crepe ring, seeing conditions allowing. Cloud belts are visible but these are much less prominent than those on Jupiter. On rare occasions large storm systems may be visible as white spots and/or patches. The use of colour filters enhances the detail.
Saturn's largest satellite, Titan (8.3), is easily visible and moderate aperture telescopes should reveal six others: Mimas (12.9), Enceladus (11.7), Tethys (10.2), Dione (10.4), Rhea (9.7), Iapetus (10.2 - 11.9). Iapetus shows decided variations in brightness, probably due to surface features, with western elongations being brighter than eastern elongations. A suitable chart will be necessary to avoid confusion with faint background stars. The *BAA Handbook* contains charts for Titan and Iapetus and data for the others. *Astronomy Now* gives a chart for Titan.
Having identified the brighter satellites visually visit the Cassini mission web site to see what remarkable objects these small specks of light really are and the fascinating planet and ring system they inhabit. See http://saturn.jpl.nasa.gov and http://ciclops.org

Photography/CCD/Webcam Imaging of Jupiter and Saturn.

The brightness and large disc size of these planets make them excellent targets for the aspiring and experienced astrophotographer/CCD/webcam imager.
A wide angle, unguided exposure of up to 25 seconds on ASA 200 or 400 slide film will record the planet amongst the background stars of the constellation through which the planet is currently passing.
The main barrier to recording “surface” details will be the prevailing seeing conditions but with patience and a little luck excellent results can be achieved.
There are a number of publications on photography and imaging to which you can refer to as necessary.

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. ms = multiple 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 is shown in brackets e.g. (6.5).

2.1 Recent and current events.

Gamma Virginis. This interesting binary is best placed for observation from late evening through the early hours star. Now past periastron it should be possible to split visually with the 16" under good seeing conditions and worth trying with smaller apertures to record when it can be resolved. Another object that requires regular monitoring over the next months. The unexpected motion detected at the last periastron passage in the 1930's has again been observed indicating the presence of an unseen companion in the system, hence the need for continuing observations.

2.2 Variable Stars.

Beta (β) Persei, Algol. +2.2 to +3.4, period 2.7 days. No suitable minima at social hours.

Mu (μ) Cephei. +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.

To become a regular variable star observer it is advisable to have your own detailed star charts or those such as available from the Variable Star section of the BAA. The Section operates a very successful "mentor" system where novices to variable star observation are given guidance and support.

P.T.O.

2.3 Double Stars/Star Clusters/Nebulae/Galaxies.

Hercules (Her).

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.

The area around M13 contains a number of faint galaxies requiring a large (12"+) telescope to explore. Articles appear from time to time in various publications as an observer makes initial contact with the area. Identity of the objects can prove interesting as some are wrongly labelled on some charts/catalogues.

NGC6210 (9.3) pn. Located about 4^{o} NE of β Her.

NGC6229 (9.4) gc. Located about 7^{o} 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.

Ophiuchus (Oph).

M9 (7.9) gc. Nearby is the dark nebula Barnard 64. Also nearby is NGC6356 (8.4)
M10 (6.6) gc.
M12 (6.6) gc.
M14 (7.6) gc.
M19 (7.1)gc.
M107 (107) gc.

Serpens Caput (SerCp).

M5 (5.8) gc.

Scorpius (Sco).

M4 (5.9) gc.
M80 (7.2) gc.
M6 (4.2) and M7 (3.3) are two open clusters that creep briefly above the southern horizon making them difficult to observe from our latitudes.

Ursa Minor (UMi).

α UMi, Polaris the Pole Star, ds (2.0 and 9.0).

P.V.H.

Useful symbols.
α β γ δ ε ζ η θ ι κ λ μ ν ξ ο π σ τ υ ϕ χ φ ω ^{o} b