Sky notes
2005 June & July

Sun, Moon and Earth

The summer solstice is reached at 06h 46m Universal Time (UT; BST minus 1 hour, equivalent to GMT) on June 21. At this time, the Sun is at its highest northerly declination in early June, then pulls out to ‘stand still’, rising as far north of east and setting as far north of west as it can for observers in the northern hemisphere. This also means that the hours of darkness are short – observers in Scotland, for example, are limited at midsummer to only an hour or so of twilight on either side of UT midnight local time (1 am BST). For the British Isles north of London, the midsummer Sun is no more than 14.5° below the horizon at its midnight lower culmination due north: astronomical twilight persists throughout the short night, making observation of faint objects difficult. The Sun itself, of course, is ideally placed for observation. The safe method of projection is recommended. Sunspot cycle 23 is now waning down towards minimum, but occasional spot groups are still breaking out, and there may be one or two present on most days. Spotless days are, however, increasingly likely as we approach the expected activity minimum in 2006/7.

Even when sunspots are scarce, suitably-equipped observers will often find reasonable numbers of prominences around the solar limb, or visible against the bright chromosphere as dark filaments. To see this activity, a narrow-passband hydrogen-alpha filter, or dedicated ‘prominence telescope’ is required – the outfit is considerable, but many have enjoyed such views in recent years as the equipment has become more readily available.

The Moon is New on June 6 and July 6. Summer’s Full Moon occurs low against the stars of Sagittarius on June 22 and Capricornus on July 21.

Earth is at aphelion, farthest in its elliptical orbit from the Sun, on July 5.

The planets

Mercury is at superior conjunction on the Sun’s far side in early June, then pulls out into the evening sky. Greatest elongation 26° east of the Sun is reached on July 9. The best chances for UK latitudes of spotting the elusive inner planet probably come in late June, when it sets about 90 minutes after the Sun. At this time, Mercury will be around magnitude 0, by greatest elongation, it will have faded to mag +0.5. Brilliant mag +4 Venus is a good guide for locating Mercury for a couple of evenings around June 27; on this date, Mercury will be around 6 arcminutes south of Venus. Both planets will be low to the northwest among the stars of Gemini at this time; Venus should be a naked eye object in the early evening, but binoculars will be needed to pick out the much fainter Mercury. Saturn is also in the grouping, a little more than a degree away. By late July, Mercury will have become too faint to be readily visible, and it reaches inferior conjunction between Sun and Earth in early August.

Venus is only slowly gaining in elongation east of the Sun, and the current evening apparition will be rather unspectacular until the year’s end. During June and July, Venus gradually stretches out to just over 30° of the Sun, but sets only 80–90 minutes after sunset. In part, this is due to the shallow angle of the ecliptic relative to the western evening horizon at this time of year.

Making a comeback from a lengthy spell of poor visibility, Mars begins to present an interesting target for observers with larger telescopes (in the 200mm aperture and upwards range) during July. By mid-July, the apparent disk diameter will have reached 10 arcseconds, and Mars brightens to magnitude 0 by the month’s end. By this time, the Red Planet will be unmistakable, rising around 23h UT due east against the relatively dim stars of Pisces, below the Square of Pegasus. The early morning hours, when atmospheric steadiness (seeing) is usually best, should afford some interesting views. Mars will continue to brighten and grow in apparent diameter through the coming months, as Earth begins to close in ahead of November’s opposition.

Jupiter, in Virgo, remains prominent in the western evening sky during June. The apparition is, however, drawing to a close, and the window of opportunity for observing the planet’s dark belts, light zones and other cloud features is limited to a hour or so after dusk: by July, Jupiter sets around 23h UT.

Its brief encounter in line of sight with Venus and Mercury in late June notwithstanding, mag +0.2 Saturn is essentially lost from view in the evening twilight, and reaches conjunction on the far side of the Sun on July 23.

Uranus, at mag +5.7 in Aquarius, and Neptune (mag +7.8) on the Capricornus/Aquarius border, are well placed in the latter parts of the month. Both can be located with 10×50 binoculars and the aid of the charts on pp 75 and 76 of the BAA Handbook.

Comets

On July 4, the NASA Deep Impact spacecraft is scheduled to deliver its penetrator into the nucleus of Comet 9P/Tuttle. At this time, the comet is expected to be a 9th- to 10th-magnitude object in southeastern Virgo, low in the western evening sky. Some projections suggest that the impact (during daylight for UK-based observers) may release sufficient volatile material from the comet’s nucleus to cause brightening to easy naked eye range. The comet will be closely monitored by ground-based telescopes around the world, and with the Hubble Space Telescope. 9P/Tuttle could remain bright for several days after impact, and the possibility of a ‘bonus’ binocular/naked eye comet will surely encourage observers to be on the alert on evenings in the second week of July – although from a UK perspective 9P/Tuttle sinks ever lower into the twilight as time goes on.

Meteors

A trickle of Ophiuchid activity, from two radiants low in the southern sky, is found throughout June, but twilight will restrict observing opportunities.

Mid-July sees a marked upturn in overall meteor rates, as several of the radiants in the Capricornus/Aquarius region become active. Most obvious are the Delta Aquarids, whose...
peak around July 27–28 will be badly af- 
fected by glare from the waning gibbous 
Moon. The shower has two radiants – a 
southern branch (the more active) near the 
star Delta Aquarii, and a northern branch near 
the Water Jar asterism.

Also in evidence during the second half of 
July and into August are the Alpha Capricor- 
nids, noted as a source of long, slow, bright 
meteors. The shower has relatively low ob- 
served rates – perhaps only two or three per 
hour at best, close to August 2 – but the 
meteors can sometimes be spectacular.

By the end of July, the Perseids, with their 
radiant at this time north of Andromeda’s 
eastern end, are beginning to show. Lunar 
phasing will favour this ever-popular shower 
at its maximum on August 12.

Noctilucent clouds

Summer’s twilight brings the ‘season’ for 
observing the delicate bands and billows of 
high-atmosphere noctilucent clouds (NLC). 
Forming at heights close to 82 km, NLC are a 
summertime phenomenon, appearing when temperatures near the mesopause reach their minimum. They are believed to consist of water ice condensed onto small 
nuclei of possibly meteoric origin. NLC are most frequently seen in those summers 
around sunspot minimum, when heating of 
the upper atmosphere by solar X-ray and 
ultraviolet radiation associated with active 
regions is reduced; on this basis, 2005 may 
prove a bumper year.

Too tenuous to be visible by day, NLC 
become apparent once the Sun has sunk lower 
than 6° (but no more than 16°) below the 
observer’s horizon. Such conditions are found 
night-long at Scottish latitudes for several 
weeks around the summer solstice. Under 
these circumstances, clouds in the lower at-
mosphere are in darkness in Earth’s shadow, 
whilst any NLC which might be present re-
mains in sunlight, showing up in contrast 
with the gathering twilight. Displays are of- 
ten brightest in the direction towards the 
Sun’s sub-horizon position.

From more southerly parts of the British 
Isles, NLC are typically restricted to the low 
northern part of the sky below the star 
Capella. Displays are more extensive at 
higher latitudes; from Scotland, the entire sky 
are in darkness in Earth’s shadow, 

variable stars

Chi Cygni, a Mira-type (long period) variable, 
should reach maximum brightness in early July. The 
star has a catalogue range from magnitude +5.2 to 
+13.4 (among the most ex-
treme for a Mira star), over 
a period of 408 days. Chi 
Cyg was last at its bright-
est in May 2004, when it 
reached an unusually bright mag +4. At most, it is 
a faint naked eye, but easy 
binocular object, close to 
the fourth-magnitude Eta 
Cygni, midway along the 
‘neck’ of Cygnus between 
Gamma and Albireo. Chi 
will be in reach of 10×50 
binoculars throughout this 
interval, and the fade from maximum is usu-
ally slower than the rise, meaning that it will 
remain readily visible well into the autumn. 
Brightness estimates should be made at 
roughly weekly intervals.

Among the naked eye variables well pre-
sented throughout the summer months, Al-
pha Herculis (also known by its Arabic name 
Ras Algethi, meaning ‘Head of the Kneeler’) 
can be an interesting star to follow. A re-
latively cool (surface temperature ca. 3000K) 
spectral class M giant star, Alpha Her varies 
in a semi-regular manner between third and 
fourth magnitude with no obvious single 
period: this is probably a consequence of 
several modes of pulsation in different 
phases occurring simultaneously in its outer 
layers. Sometimes, when two of these modes 
coincide, the star may appear noticeably 
brighter or fainter than usual. Like Chi Cyg, 
this is a star which can be followed adequately 
by making estimates at intervals of about a 
week (more frequent observations introduce 
the risk of bias). Suitable comparisons are 
Delta Her (mag +3.13) and Gamma Her 
(+3.74), Alpha Herculis’ variability was dis-
covered by William Herschel in 1795.

Deep sky

The Summer Triangle of Deneb, Vega and 
Altair (principal stars of, respectively, 
Cygnus, Lyra and Aquila) dominates the 
southern sky late in a June–July evening. 
Given the prominence of these groups, and 
right Sagittarius low to the south, it is some-
times easy to overlook summer’s fainter con-
stellations. Tucked between Cygnus/Lyra 
and the northeastern (upper right in UK 
skies) parts of Aquila is the indistinct form of 
Vulpecula, a relatively modern constella-
tion introduced by the German astronomer 
Hevelius in 1690. The constellation’s origi-
nal title of Vulpecula Anser – the Fox and 
Goose – may seem sus-
piciously like a pub 
name, but there is said 
to be no connection with 
Hevelius’ parallel 
career as a brewer.

Vulpecula is home to 
a couple of very fine 
deep sky sights. Cata-
logued as Collinder 399, 
the Coathanger 
armer is perhaps 
much more popular, 
referring to the down 
star, the arrow to the coa-
hanger asterism, and that of the display) at 
+2.8 on ISO400 
film. In recent summers, many observers have 
have obtained excellent images using digital cam-
eras on automatic exposures.

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