

Sky notes

by Neil Bone

2007 August & September

Sun and Moon

Following the short nights and lingering twilight of June and July, August sees a return to properly dark night skies at the latitude of the British Isles, and the hours of darkness increase markedly during September. The Sun is now heading southwards, reaching the intersection between the ecliptic and celestial equator at 09h 51m Universal Time (UT=GMT, BST minus 1 hour) on September 23 – the northern hemisphere autumnal equinox. Following the equinox, the hours of darkness exceed those of daylight.

Sunspot activity, which can be monitored on a daily basis by the safe method of projection, remains low at the minimum between cycles 23 and 24. The new cycle is expected to get underway soon, and some professional studies suggest that cycle 24 will have a rapid 'take-off' and prove to be among the most active in modern times.

Darkest night skies will be found a week or so to either side of New Moon, which occurs on August 12 and September 11. The Moon is Full on August 28 and September 26. Neither the total lunar eclipse at August's Full Moon nor the partial solar eclipse at New Moon in September is visible from the UK.

In the evenings following Full in August and September, the waning gibbous Moon rises comparatively early, thanks to the shallow inclination of the ecliptic to the eastern horizon at this time. Even as late as last quarter (September 4 and October 3), moonrise is before 22h local time, offering the opportunity to observe lunar features on the terminator (day/night line) under their local sunset illumination conditions at a reasonably civilised hour. Among the highlights at this time can be watching the shadows of their rims extend across the flat floors of what were once known as 'walled plain' craters such as the Alphonsus, Arzachel and Ptolemaeus chain, not far from the apparent centre of the Moon's visible hemisphere.

The planets

Mercury is at superior conjunction on the far side of the Sun on August 15, emerging thereafter into the evening sky. This is not, however, a favourable elongation for observers at northerly latitudes, and observers in the British Isles have to wait until November's morning apparition for their next chance to glimpse the innermost planet.

Having dominated evening skies for much of the year so far, **Venus** is lost from view in early August, reaching inferior conjunction between Earth and Sun on August 18. It then rapidly emerges into the pre-dawn sky as a prominent magnitude -4 'Morning Star', up 90 minutes before sunrise by the end of August. At this time, even 10×50 binoculars will show Venus' narrow crescent phase (similar to that of the Moon a couple of days before New). The crescent broadens as Venus draws farther out from the Sun during September: by late September, the planet rises almost four hours before sunrise, and is seen against the stars of Leo west of Regulus. As it pulls away from the Sun in line of sight, Venus also recedes from Earth, and its apparent disk shrinks as the crescent phase grows. With a diameter close to 40 arcseconds in late September, Venus is still an enticing target for 60–80 mm aperture telescopes.

Mars continues to brighten and improve in visibility during August and September. By late September, the planet is a magnitude 0 object, readily identifiable both by its brightness and distinctive red colour against the stars of the Taurus/Gemini border. As the distance between Earth and Mars decreases, the apparent disk of the latter grows to almost 10 arcseconds at September's close. Larger telescopes (200mm aperture upwards, say) will certainly now be starting to reveal more in the way of detail. Rising around 21h local time in late September, Mars will be well presented high in the sky during the early hours when seeing conditions (the steadiness of the atmosphere) are often at their best. In mid-September, Mars is at quadrature -90° elongation from the Sun in terrestrial skies – and around this time will show a pronounced gibbous phase, like that of the Moon a day or two after Full.

Magnitude -2 **Jupiter** is low in the southern sky during early August, seen against the stars of Ophiuchus to the northeast of Antares. By late August, the planet is already setting around 22h local time, and viewing opportunities are rather restricted for observers at UK latitudes. **Saturn**, meanwhile, reaches conjunction beyond the Sun on August 21, and will just be returning to visibility, rising an hour or so before sunrise, at the end of September.

Late summer and early autumn are ideal times to pick out the outer ice-gas planets **Uranus** and **Neptune**. Both are binocular objects, with Uranus at mag. $+5.7$ being the brighter and easier to find. Uranus reaches opposition on September 9, when it will lie about 20 arcminutes (two-thirds the Moon's apparent diameter) to the west (right) of the

4th-magnitude star Phi Aquarii, ten degrees ESE from the 'Water Jar'.

Fainter (mag $+7.8$) Neptune (restored to its status as the Solar System's outermost major planet) is at opposition on August 13, and can be found 2.5° northwest of mag $+3.7$ Gamma Capricorni. Charts for Uranus and Neptune, showing nearby field stars, can be found on pp. 80–81 of the 2007 BAA *Handbook*.

Meteors

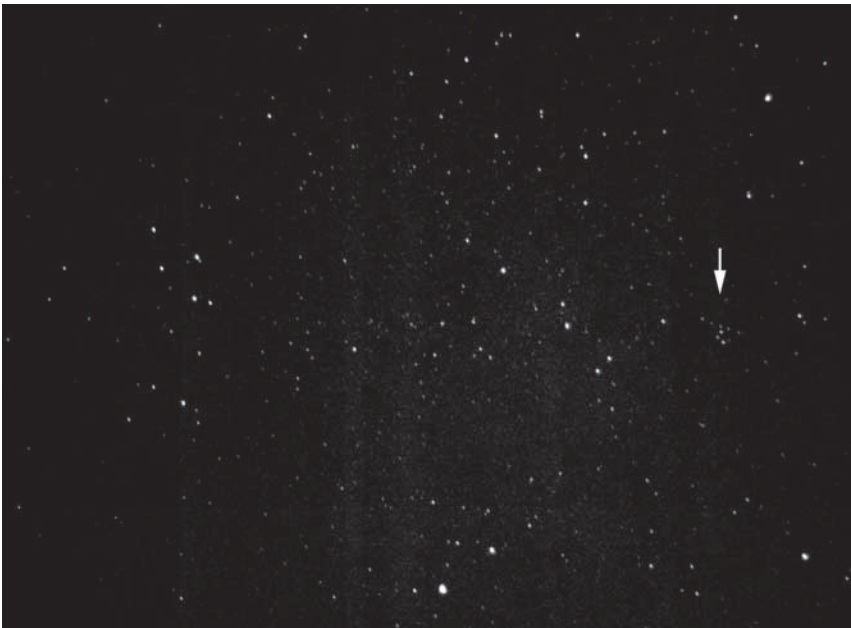
A regular highlight, producing consistently high activity for several nights close to maximum, the **Perseids** are blessed by the absence of moonlight interference at their August 12–13 peak. Good rates and an abundance of bright events make this a favourite target for even casual observers. More details can be found in Notes and News in this issue (page 163).

Also active during the opening three weeks or so of August are the **Alpha Capricornids** and **Delta Aquarids**, from radiants south of the Square of Pegasus. The Delta Aquarids have a double radiant, with northern and southern branches: the northern branch, with meteors emanating from close to the inverted 'Y' of the Water Jar asterism, peaks around August 6 and may produce observed rates of perhaps half a dozen meteors per hour.

The ever-present random sporadic meteor background is at healthy levels during August and September, and even away from the activity of the major showers can provide good rates for dedicated, patient observers as summer slips towards autumn. In September, activity is augmented by a trickle of relatively slow, medium-bright meteors from the multiple Piscid radiants – part of the more or less year-round meteoric 'drizzle' from close to the ecliptic plane.

Variable stars

Chi Cygni, one of the brightest long period (Mira type) variables, is expected to reach maximum light in late September. At most maxima, Chi reaches 5th magnitude, appearing as a faint 'extra' naked eye star on the Swan's neck close to 4th-magnitude Eta Cygni. Its brightness at maximum can, however, differ significantly from one (roughly 410-day) cycle to the next: the 2006 July/August maxi-



Delphinus (left) and Sagitta to the north of Altair in Aquila. The arrow indicates Cr399, a fine asterism for binocular observers. Image: Neil Bone (from a 10s exposure on 3M ISO3200 slide film, August 1985).

mum was unusually bright, with Chi Cygni reaching mag +3.8.

Eclipsing binary Algol (Beta Persei) becomes more favourably placed for observation in early autumn. During eclipses, Algol fades from mag +2.1 to +3.4 over the course of about 5 hours, taking the same time to recover. Eclipses occur at intervals of 2d 20h 48m, and observers can see Algol at minimum on the nights of August 16–17 and 19, and September 5–6, 8, 25–26 and 28–29.

Deep sky

On dark mid-August nights, the Summer Triangle of Deneb, Vega and Altair is high to the south, with the cluster-rich Milky Way

streaming from Cygnus in the zenith down towards Sagittarius in the SSW. At a dark location away from streetlights, the view is superb, well worth taking in from the comfort of a reclining garden chair with the aid of a pair of binoculars. Slowly sweeping along the Milky Way's length will turn up a host of interesting objects. The region just north of the spout of Sagittarius' 'Teapot' asterism is home to several bright Messier objects, including the Lagoon, Trifid and Swan Nebulae (M8, M20 and M17).

Higher in the sky, due south around midnight in mid-August (22h local time in mid-September) is the small but distinctive constellation Sagitta, an eastwards-pointing arrow just north of Altair. The Arrow's tip (Gamma Sagittae) is an excellent guide for locating one of the summer sky's most famous objects, the Dumbbell Nebula (M27,

NGC 6583) in neighbouring Vulpecula. M27 is 3° north of Gamma Sge, and can be seen quite readily in 10×50 binoculars. Even small telescopes in the 80–100mm aperture range start to show some structure, revealing the Dumbbell as elongated NE–SW, with a long axis of about 8 arcminutes. The two lobes of nebulosity from which this object takes its popular name are obvious in 150mm aperture and larger telescopes. Observers commonly describe the view as resembling an apple core! M27 is a planetary nebula, and responds well to the use of a narrow-passband OIII filter in larger telescopes.

Sagitta's tail, meanwhile, is also a good guide for locating Collinder 399, also in Vulpecula, a few degrees to its northwest. Visible to the naked eye on any reasonable night as a knot of barely-resolved faint (5th-magnitude) stars, this object, popularly known as the 'Coathanger', is best enjoyed in the low-power view of a pair of binoculars. Half a dozen stars in an east-west line form the Coathanger's 'bar', while a further four make a 'hook' to the south. Although it looks like an open cluster, Cr399 is actually an asterism – a chance line-of-sight collection of unconnected stars at vastly-differing distances.

While in the neighbourhood, it's always worth inspecting Albireo (Beta Cygni), the star on the 'beak' of Cygnus, the Swan. One of the finest colour-contrast stars in the sky, this is one of those objects like the Orion Nebula to which even veteran skywatchers who've seen it over and again will still return most nights in every observing season. With a user-friendly separation of 34.4 arcseconds, Albireo can just about be resolved with steadily-mounted 10×50 binoculars. Any small telescope at a magnification of ×20 or more will certainly do the job, revealing an orange primary of mag +3.3 and, depending on your individual colour perception, a green or blue fainter (mag +5.1) secondary to the northeast.

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