

Sun and Moon

The prolonged minimum in sunspot activity between cycles 23 and 24 continues! Observers have found the solar disk spotless through much of the summer of 2008, and although there have been occasional signs of new-cycle activity, there has as yet been no indication of the anticipated take-off in sunspot numbers. This may, of course, change soon, and although the Sun is becoming a trickier target as it heads southwards on the ecliptic as autumn advances, daily observations by the safe method of projection are the best way to keep up with developments.

The Sun's increasing southerly declination during this interval of course leads to longer hours of darkness for observers at the latitudes of the British Isles, and from mid-October onwards evening observing can begin as early as 20h Universal Time (UT=GMT; BST minus 1 hour). As an additional bonus for those looking to get out under the stars from early evening, civil clocks revert to GMT/UT from Sunday October 26.

New Moon occurs on October 28 and November 27, placing darkest evening skies in the opening and closing weeks of either month. The Moon is Full on October 14 and November 13. An occultation of Venus by the three-day old crescent Moon occurs on the afternoon of Monday December 1: see panel above.

The planets

Mercury begins October at inferior conjunction between the Sun and Earth on the 6th of the month, then pulls out into the pre-dawn sky for its most favourable apparition as a 'morning star' for northern hemisphere observers. Greatest elongation 18° west of the Sun is reached on October 22, when Mercury will be around magnitude -0.5 , standing about 10° above the ESE horizon 90 minutes before sunrise. Seen just to the south of the stars of Virgo's 'bowl', the innermost planet brightens slightly over the next week or so, and should remain visible until early November when it will still be rising an hour or so before the Sun. On November 25, Mercury will be at superior conjunction, invisible on the far side of the Sun from Earth.

Venus has been an 'Evening Star' since mid-June, but only now begins to become

A lunar occultation of Venus

Just before sunset on the afternoon of Monday December 1, the three-day waxing crescent Moon will occult Venus low in the western evening sky. The event should be fairly easy to observe with binoculars or a small telescope, with the Moon and Venus about ten degrees above the horizon. Strong earthshine may help delineate the Moon's dark, leading (easterly) limb as an aid to observation. The precise timing of Venus' disappearance behind the Moon will depend on location: the event occurs around 15:48 UT from London, 15:42 UT at Edinburgh.

Being an extended object (as opposed to a stellar point-source), Venus will take several seconds to be covered by the advancing Moon. Reappearance on the bright trailing lunar limb occurs about 80 minutes later, with the Moon much lower in the deepening dusk. This event affords an excellent opportunity for wide-angle photography, and it should be possible to get some good images of the Moon and Venus close together over the western horizon, with Jupiter joining the grouping a couple of degrees to the north.

prominent as it pulls out in elongation eastwards from the Sun. Still low on the ecliptic, against the stars of Sagittarius in late October, Venus sets around 80 minutes after the Sun as November opens, and will be visible low down as a dazzling mag -4 object in the southwest as dusk deepens. By mid-November, the planet is much more readily visible, setting two hours after sunset, and at the month's end is close to the south of the somewhat fainter (mag -2) Jupiter in Sagittarius. During this interval, Venus shows a gradually-diminishing gibbous phase, similar to that of the Moon a few days before full.

Mars is nearing the end of its apparition and is completely lost in the bright evening sky close to the Sun. Jupiter, too, becomes a rather unfavourable target during October, already low in the southwest by the end of evening twilight, and setting by 21h UT at the month's end. Observers hoping to catch a glimpse of the giant planet's cloud details will have the briefest of 'windows' in the very early evening.

Saturn, however, returns in the morning sky against the stars of Leo, about 20° to the east of Regulus. At mag $+1.0$, Saturn shines with a dull yellow hue, and is noticeably dimmer than it has been in recent years – this is because the rings are now very close to edge-on towards us, and therefore reflect less sunlight our way. Observers using small telescopes (60–100mm aperture range) may struggle to see the rings as much more than linear extensions to either side of the planet. In good seeing conditions – often to be found on hazy autumn mornings – observers with larger instruments (150–200mm aperture and upwards) may enjoy good views of the subtle cloud detail on Saturn's globe, now unobstructed by the rings. Saturn rises around 02h UT in early November, and is well up in

the southeastern sky by the end of the night.

The outer ice-gas giants Uranus and Neptune, at respective magnitudes $+5.8$ and $+7.8$, remain good binocular targets for early evening viewing. Neptune is in Capricornus, Uranus in Aquarius, and charts to aid location can be found on pages 85–86 of the BAA *Handbook*.

Minor planets

(4)Vesta is well-placed in autumn evening skies, looping westwards (retrograde) close to the stars marking the head of Cetus. A little fainter than 6th magnitude, Vesta is easy in 10×50 binoculars, and will be at its brightest towards the end of October.

Meteors

Minor shower activity from the weak Piscid stream continues through October with rates of perhaps 1–2 meteors/hr from a diffuse radiant close to the ecliptic plane. Moonlight severely hinders observations of the Orionids in 2008, with the waning gibbous to last quarter Moon rising more or less at the same time as the radiant (northeast of Betelgeuse) close to the maximum activity period around October 20–22. It should be possible to catch some of the shower's declining activity in the post-midnight hours later in the third week of October as the Moon retreats further into the morning sky.

The extended activity of the Taurids starting in late October and present throughout November may be graced this year with some bright events (see pp. 241–242 of this *Journal*), and the broad, flat peak of the shower in early November coincides with moonless evening skies.

Like the Orionids, the Leonids (active November 15–20, peak Nov 17d 12h UT) are badly affected by moonlight, and are not well-placed for observation in 2008.

Variable stars

The long-period (Mira-type) variable star Chi (ξ) Cygni should reach maximum brightness in its roughly 410-day cycle during early November. Chi may become as bright as mag +4 to +5, appearing as an ‘extra’ naked-eye star on the neck of the Swan near 4th-magnitude eta (η) Cygni. Although now becoming slightly awkwardly-placed in the western evening sky, Chi Cyg should remain within observing range for the rest of the year, and brightness estimates at weekly intervals will suffice to monitor its performance at this time.

Also on the rise is Mira (Omicron (\omicron) Ceti) itself, easily found just to the west of the triangle of Delta (δ), Gamma (γ) and Alpha (α) Ceti which make up the Sea Monster’s head. Mira is expected to peak in brightness at the end of the year, and by mid-October it should be an easy binocular

target. During November, it will probably attain naked-eye brightness, and like Chi Cygni can be followed by making magnitude estimates at roughly weekly intervals. Charts showing suitable constant-magnitude comparison stars for both Mira and Chi Cyg can be found on the Variable Star Section web pages.

Eclipsing binary Algol (Beta (β) Persei) is favourably-placed in autumn evening skies, with conveniently timed minima – during which it fades from mag +2.1 to +3.4 – for UK-based observers on the nights of October 22–23 and 25, and November 11–12 and 14–15.

Deep sky

Perseus rides high in the northeastern sky during autumn evenings and is an excellent constellation for binocular and small-telescope sweeping. Lying in the direction of the Galaxy of a spiral arm just outside our own, Perseus is home to several fine open star clusters. Many of the brighter stars making up the constellation’s straggling inverted ‘Y’ form are, in fact, part of a recently-formed stellar association. Grouped around mag +1.8 Mirfak, the Alpha Persei Moving Group (also known as Melotte 20) is the product of a wave of star formation resulting from the cosmologically-recent passage of a pressure wave compressing

dust clouds in the spiral arm. Perhaps the best way to appreciate this loose, rich stellar grouping is to lie back in a recliner late on an October or November evening with Perseus high overhead, and take in the view in binoculars.

Among Perseus’ other, more obvious clusters is M34 (NGC 1039), midway between Algol and γ Andromedae. At mag +5.2, this little ‘knot’ of stars is visible to the naked eye in good conditions, and resolves into its individual members in 10×50 binoculars. In a small telescope at ×30, M34 neatly fills the field with about 40 stars of mag +6 and fainter, covering an area 35 arcminutes across.

For many, Perseus’ real jewel is the Double Cluster, NGC 869/884, near the constellation’s border with Cassiopeia to the north. These are the heart of the Perseus OB1 stellar association (more than 7000 light years away, much more remote than the 540 l.y.-distant Alpha Per group) containing many massive, recently-formed stars. With respective integrated magnitudes of +5.3 and +6.1, the pair form a degree-long hazy naked-eye patch, elongated east–west. Binoculars readily encompass the overlapping clusters, each containing hundreds of stars in the range from mag +7 to +10. NGC 884 has a slightly more concentrated centre. This pair make another sumptuous sight for the laid-back observer late on an autumn evening.

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