Sky notes

by Neil Bone

2005 April & May

Sun and Moon

The Sun's apparent motion eastwards along the ecliptic carries it north through Pisces and Aries and on to the heights of Taurus by the end of May. Consequently, for observers at the latitudes of the UK, the Sun rises earlier and sets later with each passing day, and the hours of darkness for night-time observing steadily diminish. By late May, the Sun's high northerly declination is such that even at local midnight it is no more than 17° below the horizon from London northwards, and astronomical twilight persists throughout the short night. This situation continues until late July.

Sunspot cycle 23 is expected to reach minimum in the next 18 months, but refuses to lie down! Yet another unexpectedly large and active spotgroup (AR 720) grew to naked eye proportions as recently as January, and continued observation by the recommended safe method of projection using a small refractor should prove rewarding on most days. Records of those days – increasingly likely at this stage of the cycle – when no spots are visible are also of value, of course.

The Moon is new on April 8 and May 8, placing the darkest skies in the opening half of each month. Full Moon occurs on April 24 and May 23.

At April's New Moon, an annular-total solar eclipse will be visible along a track mainly over the Pacific Ocean, making landfall near its end in northern South America. Observers in the southern United States will enjoy a substantial partial eclipse, but no part of the event is visible from the UK. Solar eclipses are usually preceded or followed by a lunar eclipse at Full Moon. In this case, the April 24 Full Moon skirts through the penumbra of Earth's shadow after UK moonset; such events are barely noticeable, and certainly nowhere nearly so impressive as when the Moon enters the deep umbral shadow.

The planets

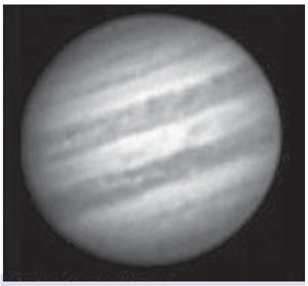
Mercury is technically a morning object, at greatest elongation 27° west of the Sun on April 26. Rising less than 30 minutes before sunrise, however, Mercury will not be visible from the British Isles during this interval.

Having passed superior conjunction on the far side of the Sun in late March, Venus emerges slowly into the evening sky during April and May. By late May, Venus' elongation east of the Sun is 16°, and it is setting barely an hour after sunset. Even at magnitude –4, the planet is an elusive target in these circumstances, and its visibility doesn't improve significantly until much later in the year.

One planet which is becoming better-placed is Mars. Throughout the past several months, the Red Planet has been a dim 'spark', rising a couple of hours ahead of the Sun. During April and May, however, it begins to brighten and pull out westwards from the Sun, as Earth begins to catch up to it on the approach to this autumn's favourable opposition. By late May, Mars has brightened to magnitude +0.3, and is prominent against the stars of Aquarius, east of the 'Water Jar' asterism, rising around 01h UT (Universal Time, equivalent to GMT; during these months, observers should remember to subtract 1 hour from BST for astronomical recording). As the distance between Earth and Mars decreases, the apparent angular diameter of the latter increases, to almost 8 arcseconds in late May: observers with larger telescopes (in the 200mm aperture upwards bracket) should now be able to make out some of the planet's albedo features, especially if seeing conditions are steady late in the night.

Jupiter reaches opposition (180° from the Sun in Earth's sky, and at its closest and apparently largest for the year) on April 3, close in the sky to the third-magnitude star Gamma Virginis, just south of Virgo's 'Bowl'. At magnitude –2.4, Jupiter will be the brightest object in the midnight sky at this time.

Telescopically, Jupiter presents a large, oblate disk, somewhat flattened by its rapid (less than 10 hours) rotation. Its equatorial diameter is in excess of 40 arcseconds, and even small telescopes in the 60–80mm aperture class will show at least a couple of the principal dark belts and lighter zones. Sketching these, and the occasional lighter spots or dark 'festoons' of material extending from the belts' edges, has always been a popular occupation for visual observers.



Jupiter on 2005 February 04, imaged by Dave Tyler

The four bright Galilean satellites – Io, Europa, Ganymede and Callisto – can be seen in binoculars.

Saturn, south of Castor and Pollux in Gemini, is nearing the end of its apparition by May. From late April, the ringed planet sets before midnight UT, and viewing becomes restricted to the early evening hours. It's worth catching one last telescopic look at the planet and its magnificent ring system during the coming months; by the time Saturn returns to view in autumn's early morning skies, the rings will have become noticeably more 'closed' in their presentation towards us.

Minor planets

(1) Ceres, the first of the asteroids to be discovered, will be well-placed for binocular observation, reaching mag +7 in early May as it moves retrograde (westwards) against the stars of Libra. During the first week of May, Ceres is about a degree north of the mag +2.6 star Zuben Elschemali (Beta Librae).

Comet Machholz

Continuing from its splendid showing early in the year (still mag +5 in mid-February as these notes were compiled), Comet C/2004 Q2 Machholz is circumpolar in this interval, never setting at UK latitudes. As it recedes from both the Sun and the Earth, however, the comet is expected to fade quite rapidly during April and May. By early May, when it will appear close to Delta Ursae Majoris – the third-magnitude, faintest star of the Plough – Machholz could be as faint as mag +9, and will require an 80–100mm aperture instrument for detection. Many observers have followed the comet since early December 2004, but most will lose it in twilight towards May's end, after a still remarkably-long observing span, probably exceeded only by Hale–Bopp's marathon visibility in 1996–'7 as far as many of us are concerned.

Meteors

Strong moonlight adversely affects the Lyrids, active from April 19–25 and peaking on the night of April 21–22. These are followed in early May by the Eta Aquarids, produced by debris from Comet 1P/Halley. Peak is around May 4–5, at which time the Moon is a thin waning crescent. The shower radiant, near the 'Water Jar' asterism, is only just clearing the horizon as dawn begins to brighten the sky at UK latitudes, but observers may wish to make the most of the final hour of the night to catch some of these swift meteors. Observed rates may be up to 5–10 per hour; observers at more southerly latitudes see the shower rather better.

Otherwise, April–May brings only low sporadic activity, augmented by a trickle of one or two meteors/hr from the rather minor near-ecliptic radiants of the Alpha Scorpiids and Ophiuchids. We can look forward to better things in August, when the Perseids are favourably-placed with respect to moonlight.

Variable stars

The long-period (Mira-type) variable star Chi Cygni is expected to reach maximum brightness in July, and observers using binoculars should find it starts climbing into range during May. Now is a good time to start a series of weekly magnitude estimates, and patient observers should be able to follow Chi up to and through maximum into its decline during the autumn. Chi is found close to Eta Cygni on the Swan's 'neck' between Gamma Cyg and Albireo, and a set of charts showing suitable comparison stars can be obtained from: http://www.aavso.org/cgi-bin/shrinkwrap.pl?path=/charts/CYG/CHI_CYG/

Chi Cygni has a catalogue range of mag +13.4 to +5.2, the most extreme among Mira stars. Sometimes it an be brighter than the catalogue peak – in 2004, for example, it reached mag +4.

Now well-presented, the prototype carbon star R Coronae Borealis bears nightly scrutiny in case another fade sets in. At peak, this is an easy binocular object close to 6th magnitude, but it can become as faint as mag +14.

Deep sky

Virgo, with its rich fields for galaxy-hunters, dominates the southern sky on April evenings. There are enough objects here – members of the Virgo cluster of galaxies at a distance of 65 million light years – to keep an observer with an 80–150mm aperture telescope busy for several dark, moonless nights. Among the brightest and easiest to find are M59 and M60, 80 arcminutes north-east of the mag +4.5 star Rho Virginis, just inside the northeastern (top left) side of the open Virgo 'Bowl'. At respective magnitudes +9.6 and +8.8, these appear as circular hazy smudges in a small instrument: each is a giant elliptical galaxy containing hundreds of billions of stars.

West (right) of Rho Vir by a couple of degrees is the 6th-magnitude star 20 Vir. Near here can be found a trio of giant ellipticals – M84, M86 and M87. M87 is the central object of the Virgo cluster, and M84 and M86 share with it the same low-power (×20) field in a small telescope. At mag +8.6, M87 is comparatively bright (to some, it appears almost like a globular cluster), while M86 (mag +8.9) and 84 (+9.0) are also easy objects.

By early May, Virgo is beginning to tilt over into the southwest at midnight. Orange mag –0.04 Arcturus stands high in the south at the sharp tip of Boötes' 'kite' outline. Southeast from Arcturus and Boötes, below the distinctive 'circlet' of Corona Borealis, is the poorly-defined constellation of Serpens Caput, the head of the snake held by Ophiuchus. Perhaps most distinctive in Serpens' outline is the triangle of third- and fourth-magnitude stars Alpha, Lambda and Epsilon Serpentis. These are a good guide for finding one of spring's best globular clusters, M5, 8° to their west. M5 is easily located north of the fifth-magnitude star 22 Ser, and at mag +5.7 is as bright as the better-known M13 in Hercules. A prominent object in binoculars, M5 is splendid in any small telescope, showing a large core region, with its outer parts almost resolving into some individual stars even in an 80mm at ×40. In 150mm aperture instruments, M5 can be resolved much of the way to its centre.

Many other globular clusters populate the southern sky of late spring and early summer, as the midnight view turns inwards to the centre of the Galaxy and the rich starclouds of Scorpius and Sagittarius. These will be regions for exploration during the short, twilit nights to come.

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