# Sky notes

## 2006 February & March

*by Neil Bone*

## Sun and Moon

The Sun's slow climb northwards along the ecliptic sees the hours of daylight start to lengthen noticeably during February – something of a relief for those who have to rise early. By early March, the days are really stretching, and the Vernal (Spring) Equinox, when the Sun's apparent centre sits on the intersection between the ecliptic and the celestial equator, arrives at 18h 26m Universal Time (UT; equivalent to GMT) on March 20. Thereafter, the hours of daylight exceed those of darkness, and night-time observing can't get properly underway until late evening.

The Sun's roughly 11-year activity cycle (currently number 23 in the series since scientific records began) is nearing its minimum, and sunspots are expected to be relatively scarce throughout 2006. During the closing months of last year, occasional large spot outbreaks continued, somewhat surprisingly, but there have also been increasing numbers of days when the projected Sun presented a blank disk. Experienced observers will be on the lookout for the first spots of new cycle 24, appearing at high solar latitudes in the year ahead.

New Moon on February 28 and March 29 places the darkest evening skies during this interval into the opening and closing weeks of the month. After New, the steep angle of the ecliptic relative to the western horizon in early evening means that the waxing crescent Moon emerges quickly to prominence, remaining high in the northwestern sky until nearly midnight by the time it is four days old. These are good times to examine the rugged terrain of the Moon's southern hemisphere in a small telescope, or even tripod-mounted binoculars. Craters and other features near the day/night line of the terminator are thrown into sharp relief by their low solar illumination angle.

For several nights to either side of Full Moon – on February 13 and March 14 – the lunar glare will swamp the fainter stars and other objects.

Civil clocks revert to British Summer Time on Sunday March 26, from which date observers should remember to subtract a hour to arrive at the astronomical standard of UT.

The March 29 New Moon sees an eclipse of the Sun, total over a track from central to north Africa, into Turkey and parts of eastern Europe. From the British Isles, the eclipse is partial, conveniently timed on a Wednesday morning. Observers at more southerly locations will see a greater portion of the Sun covered by the dark body of the Moon; at London, maximum coverage is around 20% – the event is less extensive than that seen by many last October. First contact at London occurs at 09h 42m UT, with maximum eclipse at 10h 20m, and last contact 11h 20m UT. From Edinburgh, first and last contact are at 09h 51m and 11h 15m UT respectively. Following first contact, at the Sun's south-westerly limb, the Moon will appear to advance eastwards across the solar disk. The importance of safe viewing is perhaps worth emphasising once again: for unmagnified viewing, only approved filters, under expert guidance, should be used to watch the event. Projection remains the safest option for telescopic viewing.

The partial eclipse of 2005 October 3, photographed from Suffolk by Martin Mobberley at 09.57 UT. Nikon Coolpix 5700 digital camera, 1/4000 sec. unfiltered.

## The planets

Mercury has a favourable evening apparition in mid-February, reaching greatest elongation 18° east of the Sun on February 24. Around this time, Mercury will set around 1h 40m after the Sun, and should be visible to observers with a clear northwestern horizon as a magnitude –1 'spark' low in the evening twilight. By the end of February, Mercury will have faded below magnitude 0, and will be harder to detect. Inferior conjunction, between Sun and Earth, is reached on March 12, and the planet then moves into the pre-dawn sky where it will be rather unfavourably placed.

Venus is a prominent mag –4 'Morning Star', rising over two hours before the Sun during February, and reaching greatest elongation 47° west of the Sun on March 25. Around this time, the planet will show a half-phase (similar to the last quarter Moon) in small telescopes. The timing of this *dichotomy* tends not to follow theory – half-phase is usually apparently reached some days later than expected during morning elongations, an anomaly known as the Schroeter effect after the German astronomer Johann Hieronymus Schroeter (1745–1816) who first drew attention to it. Refraction of sunlight in Venus' dense atmosphere is believed to be the cause.

Following its splendid presentation last autumn, Mars is now fading fast as it tracks eastwards against the stars of Taurus, passing north of the Hyades in early March. By this time, the Red Planet has faded to mag +0.7 (comparable to Aldebaran), and the apparent disk diameter has fallen to 7 arcseconds: only larger telescopes will now reveal much in the way of surface detail as the distance between Earth and Mars increases.

Gradually becoming better placed is Jupiter, seen against the stars of Libra. By early March, the planet rises around midnight UT, and towards the end of the night Jupiter is reasonably well up in the southeastern sky. Atmospheric seeing (steadiness) is often best in the early hours, and observers willing to sacrifice some sleep may be rewarded by fine telescopic views of the giant planet's dark belts and light zones in the March pre-dawn. At magnitude –2, and showing a markedly flattened disk with a larger dimension in excess of 40 arcseconds, Jupiter is a worthwhile target even for instruments in the 80–100mm aperture range.

Following opposition in late January, magnitude 0 Saturn remains excellently-placed in the evening sky, against the stars of Cancer to the west of the Praesepe open cluster (M44). Although now slightly narrower in their presentation than in the past couple of years, the rings remain a magnificent sight in any medium-sized telescope. Observers with instruments of 150mm aperture or greater should be able to make out some of the belts and zones on the globe of the planet itself. Titan, at mag +8 the brightest of Saturn's satellites, can be seen in small telescopes, reaching elongation due west of the planet by about four ring-spans around February 7 and 23, and March 10 and 26; eastern elongations occur eight days later.

## Meteors

February and March are generally regarded as the doldrums of the meteor observer's year, with minimal background sporadic activity, and only very minor showers in evidence, typically offering combined observed rates of only one or two meteors per hour. Things pick up slightly in the closing ten days or so of March, as the Virginids become more active. The shower has a multiple radiant, with branches in the Virgo 'bowl' and to the east of Spica. Virginid meteors are slow, and can sometimes be long-pathed and bright. A careful observer might expect to log two or three Virginids per hour after midnight in late March.

## Zodiacal Light

The faint conical glow of the Zodiacal Light, produced by reflection and scattering of sunlight from countless small particles lying in the ecliptic plane, is an elusive sight in our light-polluted times. Comparable in brightness to the fainter parts of the Milky Way (such as the stretch in Monoceros), the Zodiacal Light is best seen from truly dark locations. From temperate latitudes like those of the British Isles, the best times to look are when the ecliptic is steeply inclined to the evening western horizon (spring) or morning eastern horizon (autumn); the former circumstance applies around the equinox this March. It is also to observers' advantage that the distracting glare of both the Moon and Venus will be absent in the western evening sky at this time.

The last ten days of March probably offer the best chance to glimpse the Zodiacal Light this spring. A clear dark western horizon is essential (Atlantic coastal views have an obvious advantage), and the best time to look will be about an hour to 1½ hours after sunset, just as full darkness approaches. The Zodiacal Light, if visible, will appear as a diffuse glow extending towards Taurus.

It has been suggested that the presence of persistent high-speed particle streams in the solar wind (emerging from coronal holes) at sunspot minimum enhances the brightness of the Zodiacal Light by exciting the tenuous interplanetary medium. This being so, March 2006 could be the best opportunity for some time to catch this elusive sky-glow.

## Variable stars

February's still-long dark nights offer the chance to follow more or less the complete eclipse cycle of Algol when the timing of mid-eclipse is favourable. Best opportunities come on January 31–February 1, February 3–4 and February 23–24. On each of these occasions, moonlight won't interfere. During eclipses, which occur at intervals of 2.87 days, Algol (Beta Persei) fades from magnitude +2.1 to +3.4 over an interval of around five hours, taking the same time to recover.

During February, the long period variable star Mira (Omicron Ceti) will be climbing towards peak brightness – expected in early April, just as the star becomes lost in the western evening twilight. By early March,. Mira should be a naked eye object, just west of the triangle of stars (Alpha, Gamma and Delta Ceti) forming Cetus' head. Mira has a period of around 330 days, meaning that peak brightness is reached a month earlier from one year to the next. From 2007 onwards, we can look forward to a series of more favourably-timed maxima for this famous pulsating giant star.

## Deep sky

The bright winter constellations surrounding Orion dominate the early evening sky in February, and the coming weeks present good viewing opportunities for the famous Orion Nebula (M42, NGC 1976), a splendid object when seen in any instrument from 10×50 binoculars upwards. The cluster-rich region of Milky Way in Canis Major and Puppis, to Orion's southeast, is also always worth a visit. Brightest of the Canis Major clusters is M41 (NGC 2287), 4° south of brilliant mag –1.5 Sirius, the brightest star in the night sky.

M41 is readily visible in binoculars, resolving into a coarse grouping of around 30 stars. In a small telescope, the cluster fills the low-power (×30) field with maybe 60 7th- to 9th-magnitude stars. Particularly noticeable in small telescopes is a red star close to the cluster's relatively empty-looking centre.

Lower to the southeast from M41, the more compact NGC 2362 is also known as the 'Tau CMa Cluster', apparently surrounding that star. Tau, a mag. +4.4 O-class giant, may indeed be the most luminous member of the cluster. The remaining stars are faint, around 10th and 11th magnitude, and a reasonable aperture (150mm or above) is needed to really show the object to advantage.

Nearby to the northeast is a fine double star, showing a pleasing colour contrast reminiscent of summer's Albireo. I first encountered h3945 in a low-power sweep of the region last January, and its double nature and colour contrast leapt out even in an 80mm telescope at ×20. The primary is an orange (spectral class K) mag +4.8 star, while the secondary is mag +6.8, greenish to the eye, and lies at position angle 53° to the northeast. With a wide separation of 27 arcseconds, this is a little-known winter gem.

By late evening, the spring constellations are beginning to come to prominence in the eastern sky, led by the distinctive form of Leo. The 'Sickle' asterism – a backwards questionmark with first-magnitude Regulus at the base – forms Leo's head. The third star up the Sickle, Algeiba (Gamma Leonis) is a good, slightly testing double for smaller telescopes, with white components of mag +2.2 and +3.5 separated by 4.4 arcseconds in position angle 122° (i.e. the fainter star lies ESE from the brighter). An 80mm aperture refractor will just about resolve them under reasonable conditions; the pair is easy meat in a 100mm at ×100. Use of a 'contrast booster' eyepiece filter, which ameliorates the effects of chromatic aberration (to which small, cheap refractors can be prone) helps with this pair.

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