Sky notes

2006 April & May

by Neil Bone

Sun and Moon

Spring's lengthening days, with the Sun climbing to a higher northerly declination on the ecliptic (its apparent annual path against the star background), bring extended opportunities for solar observing. Using the safe projection method, observers can follow the comings and goings of sunspots and the associated bright patches of faculae (clouds of hot hydrogen overlying spot-forming regions, usually best seen near the solar limb). At the moment, however, sunspot activity in the current 11-year cycle (number 23) is heading towards minimum; after a succession of surprisingly large late-cycle spotgroups into the latter parts of 2005, the opening weeks of this year have brought many days when no spots whatsoever have been apparent on the solar disk – a situation likely to prevail for the next 12–18 months. Nonetheless, daily observations should still be taken whenever possible, and we may soon see the first, small, high-latitude spots heralding the start of cycle 24.

New Moon falls on April 27 and May 27, putting the darkest night-time skies in the opening and closing weeks in this interval. The ecliptic plane – close to which the Moon's orbit lies – still cuts a fairly steep angle with the western horizon in early evening at this time of year, making early April and early May favourable times to observe the young waxing crescent Moon. In the interval from 3–5 days after New, the day-night line of the terminator cuts across some of the Moon's most interesting terrain, which is thrown into relief by the interplay of light and shadow under low local solar illumination. Around April 2–3 and May 1–2, for example, the splendid crater chain of Theophilus, Cyrillus and Catherina on the southwestern (lower left) fringe of the dark Mare Nectaris are excellently presented on the terminator. The contrast between the bright heavily-cratered 'highland' regions of the Moon and the dark, relatively flat plains of the maria (lunar 'seas', filled with aeons-long solidified lava) is obvious even in a pair of hand-held 10×50 binoculars.

Around Full Moon (April 13 and May 13), absence of shadows makes it hard to pick out most features except the maria. At these times, however, the high solar illumination makes the ray systems associated with some of the 'fresher' (still many tens or hundreds of millions of years old!) impact craters stand out. Most prominent are the rays extending from Tycho in the lunar south, and around Copernicus and Kepler in the Oceanus Procellarum on the Moon's western hemisphere.

The just-past-Full Moon occults the magnitude +3.0 star Pi Scorpii around 02h UT (Universal Time; BST minus 1 hour) on May 14. Glare will make this a tricky event to observe, with the star disappearing behind the Moon's bright limb.

The planets

Mercury is very poorly placed in the morning sky during early April, rising barely 30 minutes before the Sun at UK latitudes. Superior conjunction, on the Sun's far side, is reached on May 18, and by the end of the month, Mercury can be glimpsed as a magnitude –1 'spark' low in the northwestern sky about an hour after sunset. Viewing conditions will be much more favourable in mid-June.

Venus is a 'Morning Star', but at a declination well south of the celestial equator is quite poorly positioned for observers in the British Isles. Although in excess of 40° of angular elongation west of the Sun throughout this interval, Venus rises less than an hour before sunrise, and even at mag –4 will be difficult to spot low to the southeast in the gathering dawn. Venus' gibbous phase gradually increases as the planet recedes towards the far side of the Sun.

Last autumn's favourable apparition now a distant memory, **Mars** continues its eastward progress against the star background, passing through Gemini during April and May. For a couple of nights around April 17 and 18, Mars lies about a Moonwidth to the north of the open cluster M35. The planet fades steadily from mag +1.2 at the beginning of April, to mag +1.7 by late May: this, and the dwindling apparent disk diameter (below 5 arcseconds in early May) reflects the growing distance between Earth and the Red Planet at this time.

Jupiter is at its best for the year during this interval, reaching opposition – 180° from the Sun in Earth's sky – on May 4. Around this time, Jupiter will be visible from dusk till dawn, culminating due south at midnight. Seen against the dim stars of Libra, the giant planet presents a mag –2.4 slightly-flattened disk with a large, 45 arcsecond apparent diameter. Cloud features in Jupiter's turbulent atmosphere take the form of dark belts and light zones, among which long-lived spots may also be found. The current apparition, with Jupiter reaching a maximum elevation of about 25° above the southern horizon, is the last reasonably favourable one for a while as far as UK-based observers are concerned: in the next couple of years, the planet will languish still lower, against the stars of Scorpius and Sagittarius, with all the accompanying problems of haze and poor seeing.

The four main Galilean satellites can be seen strung out in line to either side of Jupiter in the planet's equatorial plane. Even 10×50 binoculars suffice to give a reasonable view.

The magnificent globular cluster M92, imaged by the Jacobus Kapteyn Telescope on La Palma, with processing by Nik Szymanek. *Isaac Newton Group Heritage Project.*

Saturn continues to make an attractive binocular/low power pairing with the Praesepe open cluster (M44) at the heart of Cancer, well up in the western sky in the evening hours. At mag +0.2 to +0.3, Saturn remains prominent, and the ring system is still well presented: any small telescope will show it well. The planet's globe is rather bland in comparison with that of Jupiter, and with a smaller apparent diameter (less than 20 arcseconds) is reluctant to give up much in the way of detail to telescopes smaller than about 150mm aperture. With opposition now some weeks past, the shadow cast onto the rings by Saturn itself is prominent, to the west of the planet's globe.

Titan, at mag +8 the brightest of Saturn's many satellites, is visible in small telescopes, due west of the planet around April 11 and 27, and May 13 and 29; it lies due east roughly 8 days later.

Meteors

The low-activity quarter of the year finally draws to a close in April. The **Lyrids**, active from April 19–25, are well-placed with respect to moonlight this year. At the shower maximum on April 22/23 (a Saturday night to Sunday morning), the Moon is a late-rising waning crescent, whose glare shouldn't interfere with observations. The Lyrid radiant, about 10° southwest of Vega near the Lyra/Hercules border, is low until the early morning hours, and best rates will probably be found after about 01h UT. Lyrids are fairly swift, and the shower produces a reasonable proportion of events leaving behind brief persistent ionisation trains. Observed rates of maybe 6–8 Lyrids/hr can be expected on maximum night, and with a similar contribution from the contemporaneous sporadic background, visual watches made by the Meteor Section's standard methods (**http://www.britastro.org/meteor**) should be quite rewarding.

Absence of moonlight also favours the **Eta Aquarids** in early May, with a broad peak around May 4. From the UK perspective, however, the shower is rather poorly positioned: the radiant is only just climbing into the eastern sky as dawn breaks. Nevertheless, patient, determined observers may catch a few of these swift, sometimes bright meteors in the last hour or so of the night. Seen to best advantage from more southerly climes, the Eta Aquarids are – like the Orionids, which will be favourable this October – associated with Comet 1P/Halley.

Variable stars

Corona Borealis returns to prominence in spring skies, making it easier for observers to keep a night-to-night watch on the constellation's most famous variable, the 'reverse nova' **R CrB**. Fluctuating only slightly around sixth magnitude for much of the time, this ancient, carbon-rich star, which is located inside the eastern (left) side of Corona's 'circlet', is prone to sudden, unpredictable deep fades. In the space of a week or so, R CrB can go from being an easy binocular object to visibility only in the largest amateur telescopes. These dramatic plunges in brightness are caused by dark clouds of carbon condensing in the star's atmosphere, reducing its apparent light output. R CrB has been in its 'bright' state for a couple of years now, but the next fading episode could come at any time, and for many regular VS observers the star is the first port of call on a night's session.

Naked eye observers can follow the semi-regular variations of **Alpha Herculis** by making estimates of the star's brightness at weekly intervals. Located SSE of the Hercules' 'Keystone', Alpha is a pulsating red giant star, showing slow variations. The star's extreme catalogue range is from mag +2.7 to +4.0, but in a single observing season (February to December), the variation may only amount to about half a magnitude. Good constant-brightness comparison stars are Delta and Gamma Herculis, quite nearby in the sky, and with respective magnitudes +3.1 and +3.7.

Deep sky

Late spring is surely 'globular cluster season', with several of the northern sky's finest examples of this class of object well on show. Best-known, of course, is the Great Globular **M13** (NGC 6205) in Hercules. Located on the western side of the Keystone asterism forming Hercules' torso, this is an easy object for 10×50 binoculars, which will show it as a hazy circular patch. Any small telescope will give a pleasing view, showing the 17 arcminute wide M13 flanked by a couple of sixth-magnitude stars. Telescopes of 100mm and greater aperture start to resolve the outer fringes into a mass of individual equally-bright stars – perhaps as many as a million are crowded into a volume of space 140 lightyears across – and the view in large instruments is simply breathtaking.

Suffering somewhat by comparison with its celebrated companion, Hercules' other Messier Catalogue globular **M92** (NGC 6341) is a fine object in its own right. This mag +6.5 star-ball lies roughly midway between the Keystone and the quadrilateral of stars marking the head of Draco. M92 has an apparent diameter of about 12 arcminutes, and has a more condensed core than M13.

Ranked as fifth-brightest of all the globular clusters, **M5** (NGC 5904) in Serpens Caput, south of (below) Corona Borealis, shines at an overall magnitude +5.7 – equal, indeed, to M13. M5's stars are less densely-packed than those of M13, making it easier to resolve in relatively small telescopes. Binoculars will readily pick up M5 as a non-stellar spot, 8° to the west of the triangle of stars Alpha, Lambda and Epsilon Serpentis. In my small spotter 'scope, I find it quite similar in size to M92, but with less central condensation.

Another rather overlooked gem among globulars is **M3** (NGC 5272) in Canes Venatici – again, a bright object at mag +5.9. M3 is easily located, at the right angle of a triangle formed with Alkaid (the star at the tip of the Plough's handle), and Arcturus in Bootes. This is quite a loose globular, and its outer fringes show signs of resolution even in an 80mm telescope. Its 16 arcminute diameter corresponds to a true size of 180 lightyears, into which are packed half a million stars!

Neil Bone