The night sky in June & July

by Brian Mills

(Written for 22:00UT (23:00BST) on 2013 July 1.)

In the north Ursa Major lies to the west of the celestial pole and is beginning its descent towards the horizon. Its smaller namesake stands on its tail pointing towards the zenith, whilst winding its way between the two is Draco, now well placed to allow its twists and turns to be more easily identified. NGC 6543, the Cats Eye Nebula at magnitude 8.8, should be a moderately easy target in a small telescope. Cassiopeia, on the opposite side of the celestial pole to Draco has passed its lowest point and is starting to climb away from the horizon.

To the east the Summer Triangle is fully risen whilst Pegasus is just making an appearance. M57, the Ring Nebula, is now at an altitude of 60° and with a magnitude of 9.7 will require an aperture of around 80mm, although the central star will need a much larger instrument to resolve it. At this time of the year Hercules rides high in the sky lying close to the head of Draco. Several globular clusters in the area are worthy of a look although M13 is the best by far of those visible from the UK. Two others that tend to be overlooked in favour of their brighter cousin are M92 (magnitude 6.5) and NGC 6229 (mag 9.4). If open clusters are your interest, then the area in and around Cygnus is a fertile hunting ground. M29 at magnitude 6.6 and M39 at magnitude 4.6 are just two on offer.

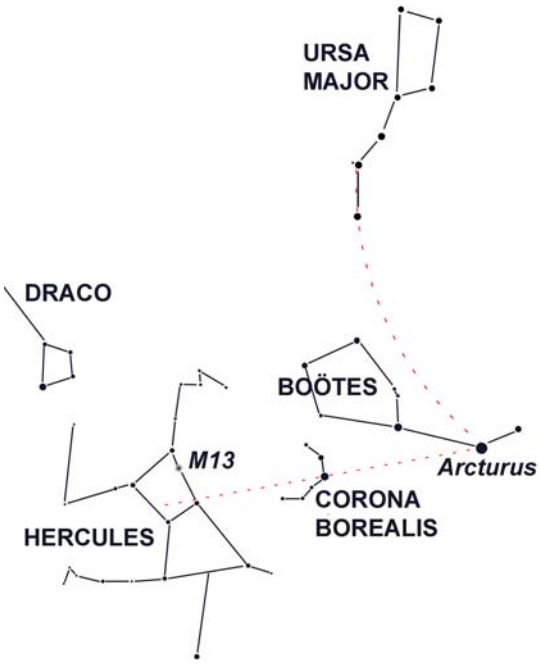
In the area of sky approximately bounded by Pegasus, Aquila and Cygnus lie the four small constellations of Equuleus, Delphinus, Sagitta and Vulpecula, which are often overshadowed by their larger and brighter neighbours.

Looking low down in the south you will see the bright star Antares – the 'Rival of Mars' – in Scorpio, a constellation that is sadly too far south for UK observers to fully enjoy. Antares is a red supergiant thought to be approximately 900 times the size of the Sun, and is a slow irregular variable. Above Scorpio in the sky are the rather faint constellations of Ophiuchus and Serpens, the latter of which is divided into two distinct parts. Just east of Scorpio is Sagittarius, more often depicted as the 'Teapot' asterism rather than as a celestial archer. It contains the galactic centre and is thus crowded with both globular and open clusters as well as many nebulae.

Hercules lies higher than all of them but is again rather indistinct with no bright stars to speak of. The best way of locating it (see chart below) is first to use the 'handle' of the Plough to find brilliant Arcturus and then draw a line from it through the brightest star in Corona Borealis, continuing it on eastwards until it brings you to the 'Keystone', a quadrilateral of stars that makes up part of the strong man's body. He is traditionally drawn standing on his head, except in a version by H. A. Rey where he appears as a running man wielding a club.

In the west Leo and Virgo are close to setting. Virgo is the second largest constellation by area in the sky, but despite this it has few bright stars although by way of compensation it is home to the Virgo Cluster of galaxies, sometimes referred to as the Virgo–Coma Cluster because this massive collection of galaxies crosses the border into Coma Berenices. The majority are of the 9th and 10th magnitudes although one or two are slightly brighter, notably M104, known as the 'Sombrero Hat' which weighs in at magnitude 8.3.

Two open clusters in Cygnus make fine binocular targets in the summer sky. *Above:* M29 imaged by Martin Butcher from the Isle of Colonsay, Hebrides. Canon 40D, 200mm SCT at f/6.3, 15×30s, ISO1600. *Below:* M39 by David Arditti, Edgware, Middx. 279mm SCT at f/2, 41×120s, CHY8 CCD + Orion Skyglow filter.



Finding Hercules with the Plough and Corona Borealis.

A little higher in the sky we find the two small constellations of Coma Berenices (which contains the north galactic pole) and Canes Venatici, the former added by Tycho Brahe, and the latter by John Flamsteed. The star group Melotte 111 is a very loose open cluster in Coma that makes a pleasing sight in low power binoculars.

Planets

Mercury reaches greatest eastern elongation on June 12 although it will be hard to locate from the UK due to the shallow angle of the ecliptic. On that date, with the Sun 6° below the horizon, Mercury will be at an elevation of just 7° shining at magnitude +0.5. It then passes through inferior conjunction on July 9 re-emerging at the end of the month into the morning sky. Greatest western elongation occurs on July 30 with Mercury just over 6° above the horizon at the start of nautical twilight.

Venus continues to pull away from the Sun although it is never as much as 15° above the WNW horizon during June and July. Its magnitude is also static at –3.8 until later in the year when it will reach –4.6.

Earth reaches the annual solstice (summer or winter) at 05:04UT on June 21.

Mars is a morning object but begins the period too close to the Sun for observation. It dims gradually from +1.4 to +1.6 as it becomes slightly easier to locate in the ENE just before sunrise. On the last day of July it is 13° high when the Sun is 6° below the horizon.

Jupiter suffers a solar conjunction on June 19, but moves briskly west of the Sun to become visible as a morning object in Gemini during the latter stages of July. On July 31 it is 15° above the horizon at the start of nautical twilight.

Phases of the Moon: 2013 June/July

New	*First quarter*	*Full*	*Last quarter*
Jun 8	Jun 16	Jun 23	Jun 30
Jul 8	Jul 16	Jul 22	Jul 29

Lunar occultations of bright stars

Date	*Time*	*Star*	*Mag*	*Ph*	*Alt °*	*% illum.*	*m m*
June 15	21.42	ZC1587	5.9	DD	15	42	40
June 19	21.33	ZC2063	6.7	DD	21	82	80
June 27	01.36	ZC3184	7.0	RD	26	82	90
June 27	01.38	46 Capricorni	5.1	RD	26	82	40
June 27	01.50	47 Capricorni	6.0	RD	26	82	60
July 2	01.38	ZC290	6.1	RD	13	31	50
July 2	03.41	SAO 92761	6.9	RD	32	31	110
July 27	03.08	SAO 109004	6.9	RD	42	76	80

Saturn, an evening object, begins the period at magnitude +0.3 but fades to +0.6 and is moving retrograde in Virgo until July 11 when it reaches its second stationary point. On June 1 it lies due south at 21:30UT at an elevation of 28°. The ring system is displayed at an angle of just over 17° as viewed from Earth.

Uranus begins the period as a mag 5.8 morning object in Pisces, but by the end of July it rises before 22:00UT. **Neptune** is also a morning object at the beginning of June. It lies in the constellation of Aquarius at a magnitude of 7.9 and rises before 21:00UT by the end of July.

Dwarf planets

(1)Ceres and (4)Vesta lie within the borders of Gemini as the period begins, but despite both migrating into Cancer they are soon lost to the solar glare.

Lunar occultations

In the table I've listed events for stars down to magnitude 7.0 although there are many others that are either of fainter stars or whose observation may be marginal due to elevation. DD= disappearance at the dark limb, RD= reappearance at the dark limb whilst RB= reappearance at the bright limb. The column headed 'mm' shows the minimum aperture telescope required to observe the event. I'm sure that the occultation sub-section, within the Lunar Section, would welcome the results of any observations that you make. Times are for Greenwich and in UT, so add one hour for British Summer Time.

Lunar graze occultations

Two grazes by reasonably bright stars occur during the period. The first is on June 15 when 55 Leonis at magnitude 5.9 grazes the southern limb of a Moon that is 41% illuminated. Unfortunately the event occurs at the terminator. The second is when 15 Sagittarii makes contact with the southern limb on July 21. The event occurs at the dark limb of a 95% sunlit Moon. Please consult the BAA *Handbook* for more information.

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