







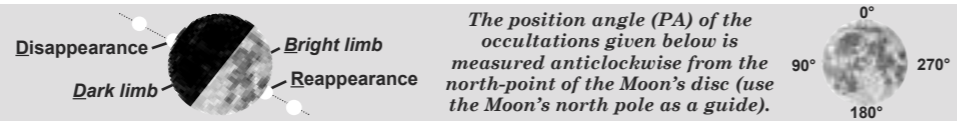
### Moon phases

|   |   |   |  |   |  |   |   |
|---|---|---|--|---|--|---|---|
|  | <b>Last quarter</b><br>06 Jul, 07:51<br>04 Aug, 18:18 |  | <b>New</b><br>13 Jul, 02:48<br>11 Aug, 09:58 |  | <b>First quarter</b><br>19 Jul, 19:52<br>18 Aug, 07:49 |  | <b>Full</b><br>27 Jul, 20:20<br>26 Aug, 11:56 |
|---|---|---|--|---|--|---|---|

### Apsides

| Date        | Apsis   | Dist (km)  | Size    | Date        | Apsis   | Dist (km) | Size    |
|-------------|---------|------------|---------|-------------|---------|-----------|---------|
| 13 Jul, 08h | Perigee | 357,431 km | 33' 26" | 10 Aug, 18h | Perigee | 358,078   | 33' 22" |
| 27 Jul, 06h | Apogee  | 406,223 km | 29' 25" | 23 Aug, 11h | Apogee  | 405,746   | 29' 27" |

### Occultations



| Date   | Name       | ZC   | Mag | Phase | Data for Greenwich |     |      | Data for Edinburgh |         |     |      |     |
|--------|------------|------|-----|-------|--------------------|-----|------|--------------------|---------|-----|------|-----|
|        |            |      |     |       | Time               | PA° | Alt° | Az°                | Time    | PA° | Alt° | Az° |
| 03-Jul | 50 Aquarii | 3288 | 5.8 | RD    | 00h 08m            | 241 | 10   | 128                | 00h 13m | 245 | 7    | 127 |
| 05-Aug |            | 444  | 5.9 | RD    | 0h 57m             | 273 | 16   | 93                 | 01h 03m | 280 | 15   | 93  |
| 21-Aug |            | 2704 | 5.9 | DD    | 22h 48m            | 32  | 12   | 211                | 22h 48m | 17  | 9    | 208 |

These are the only occultations for this period, based on the following criteria: *Mag*: Visual magnitude. *Phase*: (R)each appearance, (D)isappearance or (G)raze at (D)ark or (B)right lunar limb. *Alt*: Altitude. *The Moon's height*. *Az*: The angular position along the horizon measured clockwise from true north (through E, S, W back to N). *PA*: Position Angle, measured anticlockwise from the direction of the celestial North Pole. This listing shows lunar occultations of stars brighter than mag +6, observable with small telescopes in a sky dark enough to be seen without difficulty. For data specific to your own locality or details of fainter occultations, contact Occultation Section Director Mell Jeffery (address on p46).

▼ Occultation of 50 Aqu on 3 July 2018.



▼ Occultation of XZ 3972 on 5 August 2018.



▼ Occultation of XZ 25608 on 21 August 2018.



## Total lunar eclipse, 27 July

There will be a total lunar eclipse partially visible from the UK on the evening of Friday 27 July. The Moon will rise fully eclipsed, which in some ways is a disappointment. However, it could lead to some interesting photo opportunities and the media will undoubtedly get very excited about it! Here are the timings (all BST):

|                      |       |
|----------------------|-------|
| Moon enters penumbra | 18:12 |
| Moon enters umbra    | 19:24 |
| Totality begins      | 20:30 |
| Mid eclipse          | 21:21 |
| Totality ends        | 22:13 |
| Moon leaves umbra    | 23:19 |
| Moon leaves penumbra | 00:30 |

Although at least part of the eclipse will be visible from all over the UK, how much you see of it will depend very much on where you live. The farther south and east you are, the better. From Dover, the Moon rises at 20:42 BST, and by mid-totality it will be 4 degrees above the horizon, but from Manchester the Moon is only 1.4 degree altitude at mid eclipse. From most of England and Wales the Moon has risen by mid eclipse, but from Scotland and Ireland the Moon rises after mid eclipse.

The eclipse will be an eerie sight, with the red totally eclipsed Moon barely visible as it rises, within a few minutes of sunset. How well it will be visible will depend on how clear the sky is. The Moon at this time of year is low in the sky and appears large, so could be very photogenic with a suitable foreground.

Robin Scagell

## Planets

### Mercury

Mercury is in the western sky as this period starts, rapidly moving towards its greatest evening (eastern) elongation from the Sun; in this case the elongation is 26 degrees and occurs on 12 July. Because of the angle between the ecliptic and the horizon on summer evenings, Mercury is only 10 degrees above the western horizon at sunset for mid-UK latitudes and will therefore be hard to study. Mercury then draws rapidly closer to the Sun passing into inferior conjunction, between the Earth and the Sun, on the 9 August.

Moving on into the morning sky, Mercury again reaches elongation, this time a morning (western) elongation, of 18 degrees on 26 August. This is a better opportunity for UK observers to see the innermost planet which will rise on a bearing of around 065 degrees at 03:30 UT and reach 15 degrees of elevation by sunrise. On that day the planet will show a 41% illuminated phase some 7.5 arcseconds in size from pole to pole and, with care, can be followed into daylight for viewing at higher altitudes. Best observing opportunities will be a few days either side of the 26 August.

### Venus

In early July, Venus joins Mercury in the western evening sky and also suffers the same low-altitude problems as its neighbour; however, at a brilliant magnitude of -4.1, Venus will be much easier to find, almost due west at sunset. Venus is so bright that it can be found in daylight with an accurate go-to system or setting-circles and this allows observation at higher altitudes and in steadier air; provided sensible safety precautions are taken to avoid accidentally viewing the Sun. Each evening Venus stretches further from the Sun until its greatest evening elongation (46 degrees) on the 17 August. Sadly, the steady sinking of the ecliptic with regard to the UK horizon means that Venus appears lower in the sky at sunset for each evening from mid-July onwards, so it is best observed earlier on.

### Mars

Mars reaches opposition on the 27 July and will be magnificent throughout the period, as long as you live in the southern hemisphere! Sadly, for the UK Mars will be seen at low elevations through July and August. Early on it will only become visible from an hour or so either side of midnight UT moving from south-east to south-west,

reaching perhaps 13 degrees of elevation as it transits due south. On opposition day it will shine at magnitude -2.8, brighter than Jupiter, and show a disc 24.3 arcseconds across. By late August, Mars transits at 21:45 UT at a similar elevation to opposition night. Use an atmospheric dispersion corrector (ADC) to counter the effects of its low altitude and significant detail should be on view.

### Jupiter

In early July Jupiter transits at sunset, around 20:15UT and can then be followed in a darkening sky as it sinks towards the south-west, itself setting around 01:00 UT. Again, low altitude will bedevil UK observers, but the planet's large size and brightness will help with observation of large-scale detail. As the period progresses Jupiter will sink lower into the south-west as darkness falls, so is best observed from early in the period, but it can be followed in darkness until late August.

### Saturn

Saturn was at opposition in late June so for early July it will be appear in the south-east as twilight falls then transit due south only a little before midnight UT, at 15 degrees of elevation for mid-UK latitudes. The rings will be 41 arcseconds across and tilted 26 degrees towards us; an excellent visual presentation. By early August, Saturn transits at 21:30 UT, still at 15 degrees of elevation and by 31 August it transits in twilight at 19:35 UT.

### Uranus and Neptune

Both the "ice-giants" may be seen in the period, with Neptune appearing first; it rises in the east against the constellation of Aquarius around 23:20 UT in early July and reaches 30 degrees of elevation in the south by sunrise. By mid-period it rises at 21:15 UT and transits in darkness at 02:40 UT. In late August it can be followed from evening through to morning twilight, reaching opposition in early September.

Uranus lags Neptune by some 46 degrees so is initially lost in morning twilight. Look for it in the darker skies of August when it will be seen approaching 30 degrees elevation in the south-east at 01:30 UT and by month's end it transits at 03:30, nearly 50 degrees high.

Alan Clitherow

## Meteor notes

July and August mark the time when meteor observers get busy, after a lean time in the first half of the year. In July we have the Delta Aquarids and in August the Perseids, plus other less prolific showers which nevertheless add to the numbers seen. And the background rate of sporadic meteors also increases, so just by gazing up at the sky on a summer night you are likely to see a number of shooting stars over a matter of an hour or so.

This year, the Delta Aquarids peak of activity will be badly affected by moonlight, as full Moon is on 27 July, around the time of their maximum, though they will

continue to be seen well into August. But the good news is that it will be a good year for the Perseids, which peak around the time of new Moon, on 12-13 August, which is a Sunday-Monday.

The predicted Zenithal Hourly Rate (ZHR), which is largely a theoretical rate, is 80, but given good skies an attentive observer could see 30 or 40 an hour, particularly in the early morning of Monday 13 August. At this time the Earth is heading into the stream of meteoroids, so rates are highest. So be prepared for a long watch, and you should be rewarded.

Robin Scagell