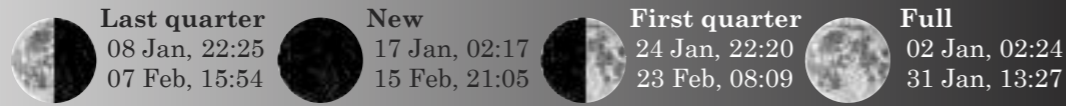




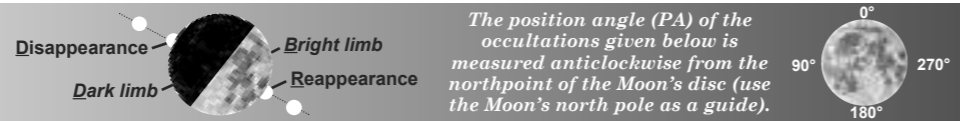
### Moon phases



### Apsides

Date	Apsis	Dist (km)	Size	Date	Apsis	Dist (km)	Size
15 Jan, 02h	Apogee	406,464 km	29' 24"	11 Feb, 14h	Apogee	405,700	29' 27"
30 Jan, 10h	Perigee	358,994 km	33' 17"	27 Feb, 15h	Perigee	363,933	32' 50"

### Occultations



Date	Name	ZC	Mag	Phase	Data for Greenwich			Data for Edinburgh				
					Time	PA°	Alt°	Az°	Time	PA°	Alt°	Az°
02-Jan	81 Geminorum	1175	4.9	RD					23h 34m	207	48	145
04-Jan	psi Leonis, NSV 04594	1434	5.4	RD	20h 47m	319	11	81	20h 45m	340	10	79
05-Jan	Regulus, alpha Leonis	1487	1.4	DB	08h 24m	107	16	269	08h 16m	104	19	263
05-Jan	Regulus, alpha Leonis	1487	1.4	RD	09h 18m	291	8	279	09h 11m	294	11	274
25-Jan		462	6	DD	23h 25m	48	23	261	23h 23m	32	24	256
26-Jan	NSV 01466	608	6	DD	23h 28m	101	33	252	23h 19m	88	34	244
27-Jan		741	5.5	DD	18h 24m	158	48	132	18h 11m	126	42	128
29-Jan	71 Orionis	947	5.2	DD	01h 25m	117	36	255	01h 15m	107	38	246
08-Feb	Zuben Elakrab, gamma Librae	2223	3.9	DB	03h 14m	147	12	133	03h 13m	138	8	131
08-Feb	Zuben Elakrab, gamma Librae	2223	3.9	RD	04h 14m	257	18	147	04h 16m	264	13	145
23-Feb	Aldebaran, alpha Tauri	692	0.9	DD	16h 37m	98	49	139	16h 36m	84	45	138
23-Feb	Aldebaran, alpha Tauri	692	0.9	RB	17h 44m	230	54	164	17h 46m	245	50	162

These are the only occultations for this period, based on the following criteria: *Mag*: Visual magnitude. *Phase*: (R)eachpearance, (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 notes

There are 9 stars occulted this period, using the SPA criteria. This includes two daylight events and a graze.

The first event is the graze of +4.9 magnitude 81 Geminorium by the rising waning gibbous Moon on 2 January. The Moon is 99% illuminated making it a difficult observation in that respect. The graze line starts on the Cumbrian coast just south of Seascale, then running across the country it travels south of Ambleside, Darlington, Thornaby and Guisborough and the out to sea on the North Sea coast between Staithes and Whitby. To the north of this graze line an occultation can be observed.

Three days later on 5 January there is the daylight occultation of Regulus by the waning gibbous Moon. The disappearance is at the bright limb, followed by the reappearance at the dark limb just under an hour later. The reappearance, however, takes place at a lower altitude. Daylight, the event taking place at sunrise, and altitude make this another difficult observation to make.

### Meteor notes

The only meteor shower of any significance in the early part of the year is the Quadrantids. Observed Quadrantid rates in favourable years can briefly rival those of the Perseids and Geminids. Unfortunately for

observers in 2018, the narrow peak is set to occur at around 19:00 UT on 3 January when the Quadrantid radiant is low in the northern sky and, even worse, only about a day away from Full Moon.

There is only one more chance to observe an occultation of Regulus in this series of occultations and that will be in March. The series began in November 2016 and ends in April 2018.

In February there is the occultation of Zuben el Akrab, in Libra. This +3.9 magnitude star reappears behind the dark limb of the last quarter Moon as it is still rising in the south east. For those interested, it disappears behind the bright limb an hour earlier in the morning but at a low altitude.

Finally there is another chance to observe an occultation by the Moon of Aldebaran. It is a daylight event taking place in the evening skies as the Sun is setting. The first quarter Moon is rising in the south east at the time with Aldebaran first occulted at the dark limb, then reappearing at the bright limb. There is one more opportunity to observe an Aldebaran occultation in the UK and that is on 22 March.

Mell Jeffery

Tracie Heywood

### Planets

In the New Year, planetary observation can best be made from sunset through to sunrise so I will discuss things in that order.

Observation should start as darkness falls, with the outermost ice giant planets Uranus and Neptune. Neptune becomes visible from around 18:45 UT in early January against the background stars of Aquarius. Already past transit and declining to the west this distant world should be observed from early in the period if possible but it does linger on right to the end of February when it has some interesting conjunctions with both Venus and Mercury, more of which shortly. Neptune will be a telescopic object, dimly shining at magnitude +7.9 and showing a disc just 2.3 arcseconds across. Telescopes of 8 inches (200 mm) aperture or more will be needed to see its aquamarine cloud-tops, and larger instruments can be used to capture images of features in the atmosphere. Neptune is very close to the star Hydor (λ Aquarius) throughout this period.

Uranus is somewhat better placed, transiting due-south at 18:55 UT in early January and remaining visible into the early hours of the morning. By mid-period, Uranus sets around 01:25 UT and by 22:00 UT in late February. At magnitude +5.8, Uranus is just visible to the naked eye on a clear night away from light pollution and can easily be picked out from the background stars of Pisces with binoculars, looking like a distinctive green "star". A telescope reveals its small but obvious 3.5 arcsecond diameter disc, and again large aperture instruments can be used to see variations in shading from equator to pole and reveal cloud features photographically with appropriate filters. Both of the ice giants are best imaged with filters that pass light in the near infrared revealing important and scientifically useful atmospheric features.

Once Uranus is too low to observe, transfer attention to the south-eastern sky for the appearance of first Jupiter, then Mars. Jupiter rises at around 03:30 UT early in the period and by 00:40 UT towards the end. At magnitude -1.8 and with a disc more than 33 arcseconds across, Jupiter is well worth waiting for and will reward

observation throughout the period. It is bright enough to be followed into daylight if suitable safety precautions are taken to ensure that the Sun comes nowhere near the telescope or viewfinder fields of view.

Jupiter keeps close company with Mars in this period and please ensure you see the spectacular close conjunction on 7 January, when Jupiter and Mars will be around one-fifth of a degree apart. The pairing will be visible with a moderate-power eyepiece even in relatively large amateur telescopes. Mars shines at magnitude +1.4 and grows above 5 arcseconds in size in this period so detail should start to become visible on its surface and it will therefore repay prolonged observation.

As we approach sunrise on 1 January we will see Mercury rising on its greatest western elongation from the Sun, some 23 degrees on that date. Shining at magnitude +1.48 it will reach 5 degrees of elevation in the south-east at 07:15 UT (for mid-UK latitudes) and can be followed until perhaps 08:00 UT before being lost in the brightening sky. Although very low, it can be observed for the first week of January and you may just catch it rising very close to Saturn on 13 January from around 07:45 UT. Mercury moves into superior conjunction behind the Sun on 17 February and will not be visible again until the early evening skies at the end of the month. Saturn improves slowly through the period, rising by 06:00 UT mid-period and 04:25 UT by the end of February but will be better observed from March onwards.

Like Mercury, Venus is also in solar conjunction in the period, but earlier, on 9 January, so it will become visible as an evening object slightly before Mercury. From late February you may catch it close to Neptune on a compass bearing of 245 degrees from 17:25 UT. On 21 February the pair will be just half a degree apart, and on 28 February Mercury joins them to form a ragged line of planets visible briefly after sunset. The visibility of Venus and Mercury will improve and the planets will make yet another close conjunction in early March.

Alan Clitherow

### Variable star notes

**Eclipsing Variables:** January and February provide a good number of opportunities to follow eclipses of RZ Cassiopeiae. In addition to eclipses that will be centred near 18:15 UT on 5 January and near 17:40 UT on 11 January, there is a series of eclipses during the evenings of 6, 12, 18, 24, 30 January and 5, 11, 17, 23 February. The first eclipse in this series will be centred near 23:00 UT. Each subsequent eclipse will occur around 35 minutes earlier than its predecessor, with the final eclipse being centred near 18:25 UT. Eclipses last for just over 4 hours.

Eclipses of U Cephei are becoming more favourable. An eclipse on 2 January will be centred near 23:00 UT, with subsequent eclipses during the nights of 7, 12, 17, 22, 27 January and 1, 6, 11, 16, 21, 26 February. Each eclipse will occur around 20 minutes earlier than its predecessor and the final eclipse will be centred at around 19:20 UT. Eclipses last for around 9 hours.

The most favourable eclipses of Algol (beta Persei) will be centred near 20:45 UT on the evening of 18 January, near

17:35 UT on 21 January, and near 19:15 UT on 10 February. Eclipses last for nearly 10 hours.

**Mira-type variables:** Mira (omicron Ceti) is predicted to reach maximum in late January and from reasonably dark observing sites should be visible with the naked eye for most of January and February.

Chi Cygni, having passed through a brighter than average maximum during the autumn, will now be well into its fade, but may still be visible in binoculars at the start of January.

R Bootis and T Ursae Majoris are both due to reach maximum in the second half of February. They are likely to reach binocular visibility during January.

R Leonis and T Cephei should also be visible in binoculars, although their next maxima are not due until April and June respectively.

Finder charts for these and other variable stars on the SPA VSS programme can be found by clicking on the name of the star in the Observing Programme listing on the Variable Star section's web pages.

Tracie Heywood