

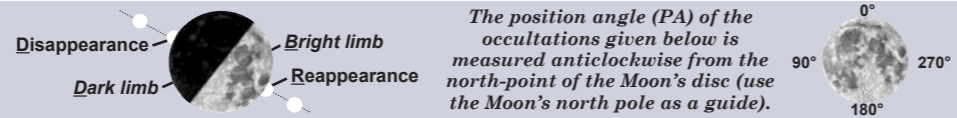


A summary of the main sky events, September to October 2020 (UT times)

Moon phases	Last quarter	New	First quarter	Full
	10 Sept, 09:26 10 Oct, 00:40	17 Sept, 11:00 16 Oct, 19:31	24 Sept, 01:55 23 Oct, 13:23	02 Sept, 05:22 01 Oct, 21:05

Apsides	Date	Apsis	Dist (km)	Size	Date	Apsis	Dist (km)	Size
	06 Sept, 18 Sept	06h Apogee 14h Perigee	405,607 359,082	29' 28" 33' 17"	03 Oct, 16 Oct	17h Apogee 00h Perigee	406,321 356,912	29' 41" 33' 29"

Occultations



Date	Name	ZC	Mag	Phase	Data for Greenwich				Data for Edinburgh			
					Time	PA°	Alt°	Az°	Time	PA°	Alt°	Az°
3 Sep	NSV 15038	18	5.8	RD	21h 43m	248	17	123	21h 49m	252	14	123
13 Sep	SAO 79607	1161	5.9	RD	02h 46m	223	23	82	02h 57m	238	23	83
27 Sep	Epsilon Capricorni	3164	4.5	DD	21h 12m	60	19	181	21h 10m	53	15	177
30 Sep	30 Piscium, YY Piscium	3536	4.4	DD	23h 40m	77	33	185	23h 37m	66	28	181
1 Oct	33 Piscium, BC Piscium	5	4.6	DD	Appulse				02h 09m	120	21	221
3 Oct	64 Ceti	322	5.6	RD	23h 24m	263	41	141	23h 25m	274	37	139
4 Oct	Xi ¹ Ceti, NSV 00749	327	4.4	RD	00h 41m	268	47	166	00h 37m	283	42	161
7 Oct	HU Tauri	700	5.8	RD	03h 05m	264	59	167	03h 01m	280	54	162
7 Oct	109 Tauri	792	5	RD	21h 15m	240	9	65	21h 23m	246	10	65
21 Oct	Kaus Borealis, Lambda Sagittarii	2672	2.8	DD	18h 22m	60	9	206	18h 16m	53	6	202

These are the only lunar occultations of stars brighter than mag +6 for this period that are observable with small telescopes in a sky dark enough to be seen without difficulty. Abbreviations: Mag: Visual magnitude. Phase: (R)eappearance, (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. For data specific to your own locality or details of fainter occultations, contact Occultation Section Director Mell Jeffery (address on p46).

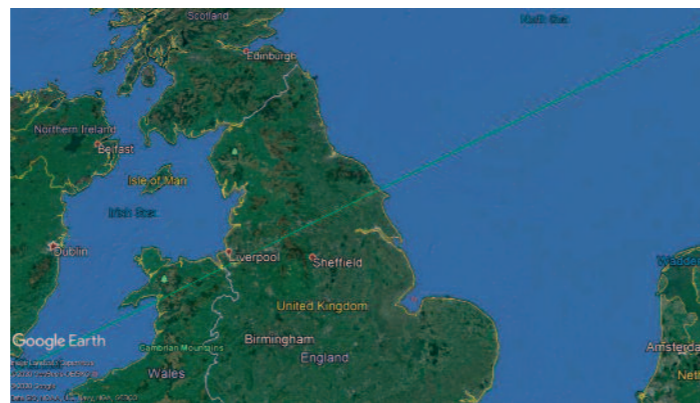
Occultation notes

A reasonable list of stars has been compiled using the selection criteria used for the SPA. Do remember that there are always fainter stars being occulted and I can provide information on these for you on request.

The brightest one for this period is that of magnitude +2.8 Lambda Sagittarii (Kaus Borealis). As the 31 per cent illuminated crescent Moon is in the south and setting, it is already at a low altitude and the farther north you are the lower the altitude will be, so this event is more suited to those in the south of the country with a reasonably clear horizon. I wouldn't normally put an event up with an altitude of 9 degrees but this is a bright star and might be worth a look if you have a good horizon and the atmospheric conditions are in your favour.

There is a graze listed in the data too. This takes place on 1 October when the Moon is almost full and as a result this will be a challenging observation. The star, +4.6 magnitude 33 Piscium, grazes the southern cusp of the Moon but farther north, as from Edinburgh, there is an occultation where the star disappears behind the dark limb, or what is left of it! The graze path starts on the coast of Wales between Porthmadog and Harlech, goes through Widnes, Leeds and to the south of York and out the east coast between Filey and Reighton. South of this graze path an appulse can be observed.

If you do manage to observe either of these events or any others, listed or not, do send me a report.



▲ The graze path of 33 Piscium on 1 October 2020.

▼ A graphic showing the graze event.



Mell Jeffery, FRAS

Planets

Mercury puts on a good evening show for southern-hemisphere observers in late September and early October but is extremely low for observation from the UK. Greatest evening eastern elongation from the Sun is on 1 October with Mercury trailing the Sun by 26 degrees but the low angle of the ecliptic to the horizon means that even from the south coast of the UK the planet will only be glimpsed on a bearing of 240 degrees and just above the horizon at sunset on that date. Mercury is at inferior conjunction, between the Earth and the Sun, on 25 October.

Venus starts September a little past its greatest western morning elongation and is very obvious in the pre-dawn sky. Early in September Venus rises at 01:20 UT for mid-UK latitudes and reaches 35 degrees elevation in the east by sunrise; it can readily be followed into daylight. As the period progresses Venus will sink slightly lower at each sunrise but even in late October it rises at 03:45 UT and will reach above 25 degrees in the south-east at sunrise. Its visible phase will grow from 60 per cent to 72 per cent in the period while its apparent size shrinks from 19.5 to 13 arcseconds. Throughout, Venus blazes at brighter than magnitude -4.0 and is a magnificent morning-sky object.

Mars reaches opposition, due south at midnight UT, on 13 October so is readily observable throughout this period and onwards into November. During September evenings it can be found in Pisces and followed into the early hours, brightening from magnitude -1.8 to -2.5. It will be the brightest night-time object in this region, barring the occasional passage of the Moon, and is easily seen due to its brightness compared with background stars and its obviously red colour. South transit is at 03:13 UT in early September, 01:05 UT mid-period and 22:33 UT in late October, above 40 degrees of elevation at transit for mid-UK observers. In October Mars will peak at magnitude -2.6 and on opposition night will show a disc 22 arcseconds across. This is an excellent period to observe Mars and every opportunity should be taken to see it.

Jupiter and Saturn sit very close together and are well presented for mid-evening observation, if at lower altitude than one might prefer from the UK. In early September

Jupiter transits, due south, at 20:35 UT; mid-period, south transit is at 18:42 UT and in late October at 16:57 UT at the start of twilight. This means Jupiter is best seen in darkness early in the period but, in any case, its elevation is around 16 degrees at transit for mid-UK latitudes. Saturn follows shortly behind Jupiter, transiting around 20 minutes later and sitting a degree or so higher. As the Earth pulls away from both planets their apparent size falls in this period; Jupiter from 44 to 37 arcseconds and Saturn from 18 to 16.4 arcseconds with its beautiful rings shrinking from 41 to 37 arcseconds. The rings are tilted towards us by 22.5 degrees with the northern pole area on view. Jupiter will be much brighter and more obvious against the dim background stars of Sagittarius but Saturn can easily be found by scanning 5 degrees east of it.

Of the ice-giants, Neptune reaches opposition on 11 September so is visible all night for much of this period. Its south transit elevation will be around 32 degrees throughout, with times of 00:44 UT in early September, 22:48 UT mid-period and 20:44 UT in late October. Sitting initially 7 degrees east and a little above the star Hydor, Lambda Aquarii, and moving a degree closer as the period progresses, Neptune will shine at magnitude +7.8 and show a disc just 2.4 arcseconds across so will take large and stable binoculars or a telescope to find. Look initially for a blue or blue-green "star" in this area then add magnification to find the planetary disc.

Uranus is even better placed, coming to opposition on 31 October with south transit at 03:57 UT in early September, 01:56 UT mid-period and midnight UT in late October. At magnitude 5.7 and 3.2 arcseconds across it will be easier to track down than Neptune and found at the front hooves of Aries, above the head of Cetus the Whale. At south transit Uranus will be above 50 degrees elevation so good seeing will reward you with very clear views. Planetary photographers should try both planets with an infrared-pass filter and long video captures to try and isolate bright cloud features in the atmospheres of these distant worlds.

Alan Clitherow

Variable star notes

Eclipsing binaries: During September, there will be only one eclipse of RZ Cassiopeiae easily visible from the UK. It will occur on the 24th at 23:50 UT. However, during October, RZ Cassiopeiae can be observed in mid-eclipse on the 6th, 12th and 18th at 22:40 UT, 22:05 UT and 21:30 UT respectively.

There won't another easily visible eclipse of Beta Persei (Algol), as seen from the UK, until October, when it will be seen in mid-eclipse on the 6th at 22:35 UT.

Long-Period variables: Omicron Ceti (Mira) is due to reach maximum brightness during October, so should be visible in binoculars during September. The long-period stars S Ursae Majoris and R Ursae Majoris are due to reach maximum brightness in September and October respectively. Both R Boötis and T Cephei reached maximum in August and are now fading to their minimum in December, but should still be visible in binoculars. Both T Ursae Majoris and Chi Cygni will be at minimum in September, so will only be visible in very large telescopes.

Matthew Barrett

Meteor notes

September's showers are once again impacted by the Moon. The Aurigids reach their peak on 31 August, just before the Full Moon. A week later, on 10 September, the first-quarter Moon will affect the peak of the Eta Perseids. These showers have rates of five or six per hour. In late September you may see a few Daytime Sextantids at dawn or dusk and radio observers may pick them up all day.

In October, the Draconids peak on the 8th with an hourly rate of about ten and are best observed in the evening, with about 90 minutes of full darkness before moonrise. The Orionids peak on the 22nd with an hourly rate of five and are best observed after midnight once the radiant has risen. There are a few other weak showers: the Eta Geminids peak on 18 Oct, the Southern Taurids on 10 Oct, the Leonis Minorids on 24 Oct and the Northern Taurids, active from 20 Oct through into November. These showers have rates of under five.

Remember if you do spot something interesting to send details to meteor@popastro.com.

Mark McIntyre