

La Société Guernesiaise Astronomy Section

# Astronomical events in 2018

as seen from Guernsey

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This year sees a very favourable opposition of Mars on 27 July and, on the same day, a total lunar eclipse. There will also be a naked-eye comet to look forward to. In January there will be two full moons – both of them ‘supermoons’ – and again in March, with no full moons in February.

## PLANETS

**Mercury** will be visible in the periods around its greatest elongations:

Date	Elongation	Direction	Time
01 January	23° Western	Low in East	Before sunrise
15 March	18° Eastern	Low in West	After sunset
29 April	27° Western	Low in East	Before sunrise
12 July	26° Eastern	Low in West	After sunset
26 August	18° Western	Low in East	Before sunrise
06 November	23° Eastern	Low in west	After sunset
15 December	21° Western	Low in East	Before sunrise

**Venus** will be at superior conjunction on 09 January. It will have a close conjunction with Uranus on 28 March, and will be less than 1° from the just-passed-Full Moon on 16 February, very low in the west immediately after sunset. It will become prominent in the evening western sky from April, reaching greatest eastern elongation on 17 August, and remaining visible until September. It will be at inferior conjunction on 26 October, reappearing in November as the “Morning Star” in the eastern pre-dawn sky.

**Mars** will start the year as a morning object in the east, rising earlier and earlier as the months progress. It will be 1.3° from Saturn and just 0.4° from M22, the Sagittarius Cluster, in the morning of 02 April, low in the southeast.

It will reach opposition in Capricorn on 27 July, when it will rise as the Sun sets and be visible all night. This will be the best opposition for several years. Curiously, the planet will be closest to Earth four days after opposition, on 31 July. With a distance of 58 million km (36 million miles) it will be Mars’s closest approach since 2003, which was itself the best one in 60,000 years. The next one, in October 2020, will be almost, but not quite, as good as this one, and we will have to wait until 2035 for a closer one.

However, with a declination of -25° Mars will remain low in our skies, reaching a maximum altitude of only 15°. Nevertheless, having a diameter of 24 arc-seconds it will certainly be worth observing and photographing. The south polar cap will be tilted towards the Earth, and some surface detail should be evident. It will have a magnitude of almost -3. It will remain an evening object for the remainder of 2018.

At the beginning of the year **Jupiter** will be a morning object, rising around 3.30 am. It will reach opposition on 09 May in Libra with an altitude of 25°, and will then remain an evening object until early November. It will reach conjunction with the Sun on 26 November and will reappear in the pre-dawn sky in mid-December.

During the summer we will have good views of the four Galilean moons, atmospheric bands on the planet's disc, and the Great Red Spot. Transit, shadow and occultation events involving Jupiter's moons can be calculated using a Java script at [http://www.skyandtelescope.com/wp-content/observing-tools/jupiter\\_moons/jupiter.html](http://www.skyandtelescope.com/wp-content/observing-tools/jupiter_moons/jupiter.html) on the *Sky & Telescope* website. (You may need to register at <http://tinyurl.com/24kp25> and remember to enter the date in the US format: month/day/year). They can also be found in the 2018 BAA Handbook (pages 67-76). They can be simulated on software such as StarryNight (<http://www.starrynightstore.com/>), and some of the many astronomy apps, including the *JupiterMoons* app (\$2.99) by Sky & Telescope, which also gives the transit times of the Great Red Spot. The Spot's transit times are also available at <http://www.skyandtelescope.com/observing/celestial-objects-to-watch/transit-times-of-jupiters-great-red-spot/> (again using the US date format).

**Saturn** will start the year as a morning object, rising in the east in Sagittarius at 07.00 am, and rising earlier as the months go by. Opposition will be on 27 June, the planet rising as the Sun sets, and visible all night, but with a maximum altitude of only 18°. It will remain visible as an evening object, until early December. The rings are at a good angle for observation, and its brightest moons, especially Titan, should also be visible.

**Uranus** will be at opposition in Aries on 24 October, at magnitude 5.7. **Neptune** will be at opposition in Aquarius on 07 September, at magnitude 7.8.

## PHASES OF THE MOON

New Moon	First Quarter	Full Moon	Last Quarter
		Jan 02	Jan 08
Jan 17	Jan 24	Jan 31	Feb 07
Feb 17	Feb 24	Mar 02	Mar 09
Mar 17	Mar 24	Mar 31	Apr 08
Apr 16	Apr 22	Apr 30	May 08
May 15	May 22	May 29	Jun 06
Jun 13	Jun 20	Jun 28	Jul 06
Jul 13	Jul 19	Jul 27	Aug 04
Aug 11	Aug 18	Aug 26	Sep 03
Sep 09	Sep 16	Sep 25	Oct 02
Oct 09	Oct 16	Oct 24	Oct 31
Nov 07	Nov 15	Nov 23	Nov 30
Dec 07	Dec 15	Dec 22	Dec 29

## SUPERMOONS

So-called 'supermoons' occur when the Full Moon happens to coincide with the Moon's closest approach to Earth ('perigee'), and therefore appear larger than usual. In 2018 there will be two such moons, both in January: on 02 and 31. So-called 'blue' moons have been said to refer to occasions when there are two full moons in a month, so perhaps should these be referred to as blue supermoons!

## DWARF PLANETS AND ASTEROIDS

**Pluto** will reach opposition on 12 July in Sagittarius, at magnitude 14.2. **Ceres** will be at opposition on 31 January in Cancer, with magnitude 6.8. The other three dwarf planets (Eris, Makemake and Haumea) are too faint to be seen in most amateur telescopes.

The brightest asteroid **Vesta** will reach opposition on 19 June, when it will be magnitude 5 in Sagittarius. It will be 1° above the thin crescent Moon at 04.00 UT on 12 January, very low in the East, magnitude 7.

## ECLIPSES

On 31 January a total lunar eclipse will be visible from Asia, Australia and part of North America, but not from this part of the world.

On 15 February there will be a partial lunar eclipse, but only in Antarctica and South America.

A partial solar eclipse will be visible from Southern Australia and Antarctica on 13 July.

On 27 July a total lunar eclipse will be visible from all of Europe, including Guernsey, where it will be seen as the Moon rises. The Moon rises at 20.52 BST. At that time the Moon will already be 20 minutes into the total phase of the eclipse. Maximum eclipse, however, occurs some 30 minutes later, at 21.21 BST. Totality ends at 22.13, and the Moon will leave the umbra at 23.19, finally leaving the penumbra at 00.30 BST.

This eclipse is almost a central one, ie the Moon passes close to the centre of the Earth's shadow. We can therefore expect it to be quite a dark one. It takes place in the constellation Capricorn – not a very rich star field. Nonetheless, being low in the south-eastern sky (azimuth 120°) it should be a lovely sight, and could create some interesting imaging possibilities with foreground objects.

A partial solar eclipse occurs on 11 August, but is not visible from Guernsey.

Be sure to take precautions not to look at the Sun directly unless your eyes and/or telescope are properly protected by a specialist solar filter.

## OCCULTATIONS

05 January the 1.3-magnitude star Regulus will be occulted by the Moon, low in the west from 08.26 UT. However, the Sun will have risen 20 minutes earlier, making observation of this event doubtful. It will again be occulted on 01 March at 06.12 to 07.00 UT, the Sun rising at 06.53, so there may be a chance of catching the start of this event.

There will be a lunar occultation of the first-magnitude star Aldebaran on 23 February, but again this will take place during daylight, at 16.33 UT, the Sun setting at 17.43. There will be a better, night-time occultation of Aldebaran at 23.45 UT on 22 March, very low (3°), at 290° azimuth. It will end at 00.14, just after the Moon sets.

## LUNAR CONJUNCTIONS

The best conjunctions of the Moon and the bright planets, with their positions and separations are:

16 February	Venus	Very low in west after sunset	0.8°
01 June	Saturn	Early morning in southwest	0.5°
28 June	Saturn	Morning in west	1.0°
25 July	Saturn	Morning in southwest	2.6°
18 October	Mars	Evening in west	2.7°
11 November	Saturn	Low in southwest in evening	0.7°

## PLANETARY CONJUNCTIONS

The best conjunctions between planets, with their positions and separations, are:

07 January	Mars and Jupiter	Morning in the east	0.3°
13 January	Mercury and Saturn	Morning in the east	0.6°
28 March	Venus and Uranus	Evening in the west	0.3°
02 April	Mars and Saturn	Morning in the southeast	1.3°

## METEORS

The **Quadrantids** will peak on the night of 03/04 January, but will be badly affected by a waning gibbous Moon. The **Perseids** will peak on the night of 12/13 August, with some 80 per hour. With a New Moon on 11 August conditions are very favourable for this shower. The richest annual shower, the **Geminids**, will peak on the night of 13/14 December. The waxing crescent Moon will set at 10.00 pm, so conditions should be very favourable.

There are, of course, minor meteor showers during the year, and sporadics may be seen at any time. For shower details see the 2018 BAA Handbook, pp98-99.

## COMETS

Comet 21P/Giacobini-Zinner, the source of the October Draconid meteor shower, has a period of 6½ years. In 2018 there will be a particularly good apparition, making a close approach in September at a distance of 0.4 AU (58 million km, 36 million miles). It should start to become visible in telescopes in June, high in the evening sky in Cygnus. It will brighten rapidly and move north into Cassiopeia, then moving south and becoming mostly a morning object by September, when it could reach naked-eye magnitude 3½. It will pass close to M37 on 11 September and M35 on 15/16 September, giving some good imaging opportunities. It should be visible until the end of October.

Comet 46P/Wirtanen is predicted to be a binocular object in November, and possibly a naked-eye object in December, when it will be in the evening sky, remaining visible until March 2019. At its closest it will be just 0.078 AU away (11.7 million km, 7.25 million miles).

Comet 2016 R2 PanSTARRS might be 9<sup>th</sup> magnitude or brighter from the beginning of the year, and then fading. It will be well-placed for observing.

Detailed comet predictions for 2018 are available on the website of the British Astronomical Association's Comet Section: <http://www.ast.cam.ac.uk/~jds/preds18.pdf>. Also check the Heavens-Above website ([heavens-above.com](http://heavens-above.com)) for star charts showing comet positions, and use programs such as StarryNight for detailed location charts.

## THE SUN

We are now well past the maximum of the sunspot cycle in 2014, but there can still be outbursts of activity, with displays of the aurora borealis (and australis) at high latitudes. Details of sunspot numbers are at [www.ips.gov.au/Solar/1/6](http://www.ips.gov.au/Solar/1/6), and real-time views of the Sun are at <https://umbra.nascom.nasa.gov/newsite/images.html>. Auroral alerts, with lots of other information, are at [www.spaceweather.com](http://www.spaceweather.com).

## EQUINOXES AND SOLSTICES

The following are the dates and times of the equinoxes and solstices in 2018:

Vernal Equinox	20 March	16.16 UT
Summer Solstice	21 June	11.08 BST
Autumnal Equinox	23 September	02.55 BST
Winter Solstice	21 December	22.23 UT

## SATELLITES

The International Space Station (ISS) is regularly visible from Guernsey, looking like a very bright star crossing our skies from west to east. Also of interest are flashes from the Iridium satellites (which occur virtually every night), and periodic launches of ISS servicing craft. Many other, fainter, satellites appear every night. Details of the times and directions of visibility (together with sky charts and much more) can be obtained from [www.heavens-above.com](http://www.heavens-above.com), linked from our webpage [www.astronomy.org.gg/iss.htm](http://www.astronomy.org.gg/iss.htm).

## WEA COURSE

The Astronomy Section's annual six-week WEA "Star Gazing" course at the Observatory will be run from 08 February to 15 March. It is usually over-subscribed, so early enrolment is recommended. See [www.wea.org.gg](http://www.wea.org.gg), or telephone 237888.

## OPEN DAYS

The Observatory will be open to the public again for a number of evenings during the year, including weekly openings on Thursdays during the summer school holidays (19 July to 30 August). Details will appear on our website and will be sent to the local media.

## REFERENCES

*SkyMap Pro* and *Starry Night Pro* software

<https://www.fourmilab.ch/images/3planets/elongation.html>

<http://www.seasky.org/astronomy/astronomy-calendar-2018.html>

<http://www.timeanddate.com/>

[http://www.alpo-astronomy.org/jbeish/2018\\_MARS.htm](http://www.alpo-astronomy.org/jbeish/2018_MARS.htm)

<https://www.ast.cam.ac.uk/~jds/preds18.pdf>

<https://www.imo.net/files/meteor-shower/cal2018.pdf>

<https://www.timeanddate.com/>

RAS diary 2018

There is a useful list of Internet resources on pages 114-5 of the 2018 BAA Handbook, which is available at the Guernsey Observatory.

## CALENDAR OF ASTRONOMICAL EVENTS IN 2018

Month	Date	Time	Event
January	01	Before sunrise	Mercury at greatest western elongation
January	02	All night	Supermoon
January	03	05.34 UT	Earth at perihelion (147,097,233 km)
January	03/04		Quadrantid meteor shower (unfavourable)
January	05	08.26 UT	Lunar occultation of Regulus
January	07	Morning	Mars and Jupiter conjunction (0.3°)
January	09		Venus at superior conjunction
January	13	Morning	Mercury and Saturn conjunction (0.6°)
January	31	All night	Supermoon
January	31	All night	Ceres at opposition (magnitude 6.8)
February	08	19.30 UT	WEA course starts at Observatory
February	16	After sunset	Venus conjunction with Moon (0.8°)
February	23	16.33 UT	Lunar occultation of Aldebaran
March	01	06.12 UT	Lunar occultation of Regulus
March	15	After sunset	Mercury at greatest eastern elongation
March	15	19.30 UT	WEA course – final class
March	20	16.16 UT	Vernal Equinox
March	22/23	23.45 - 00.14	Lunar occultation of Aldebaran
March	25	01.00 UT	BST starts
March	28	Evening	Venus and Uranus conjunction (0.3°)
April	02	Morning	Mars, Saturn and M22 conjunction
April	29	Before sunrise	Mercury at greatest western elongation
May	09	All night	Jupiter at opposition
June	01	Morning	Saturn conjunction with Moon (0.5°)
June	19	All night	Vesta at opposition (magnitude 5)
June	21	11.08 BST	Summer Solstice
June	27	All night	Saturn at opposition
June	28	Morning	Saturn conjunction with Moon (1°)
July	06	18.46 BST	Earth at aphelion (152,095,566 km)
July	12	After sunset	Mercury at greatest eastern elongation
July	12	All night	Pluto at opposition (magnitude 14.2)
July	19	Evening	Observatory Open Evenings start
July	25	Morning	Saturn conjunction with Moon (2.6°)
July	27	All night	Mars at opposition
July	27	20.52 - 23.19 BST	Total lunar eclipse
August	12/13		Perseid meteor shower (very favourable)
August	17	Evening	Venus at greatest eastern elongation
August	26	Before sunrise	Mercury at greatest western elongation
August	30	Evening	Observatory Open Days end
September		All night	Comet 21p/Giacobini-Zinner
September	07	All night	Neptune at opposition (magnitude 7.8)
September	23	02.55 BST	Autumnal Equinox
October	18	Evening	Mars conjunction with Moon (2.7°)
October	24	All night	Uranus at opposition (magnitude 5.7)
October	26		Venus at inferior conjunction
October	26		Venus at inferior conjunction

October	29	02.00 BST	BST ends
November	06	After sunset	Mercury at greatest eastern elongation
November	11	Evening	Saturn conjunction with Moon (0.7°)
November	26		Jupiter conjunction with the Sun
Nov/Dec		Evening	Comet 46P/Wirtanen
December	13/14		Geminid meteor shower (very favourable)
December	15	Before sunrise	Mercury at greatest western elongation
December	21	22.23 UT	Winter Solstice