

Astronomical events in 2017

as seen from Guernsey

By David Le Conte

A major solar eclipse in the USA on 21 August will result in a minor partial eclipse in Guernsey just before sunset. We should have some good views of the planets, and a few comets may be sufficiently bright to be seen in the Observatory telescopes or with binoculars, or perhaps in one or two cases with the naked eye.

PLANETS

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

Date	Elongation	Direction to look	Time	Comments
19 January	24° Western	Low in East	Before sunrise	
01 April	19° Eastern	Low in West	After sunset	Too low
17 May	26° Western	Low in East	Before sunrise	
30 July	27° Eastern	Low in West	After sunset	
12 September	18° Western	Low in East	Before sunrise	Too low
24 November	22° Eastern	Low in west	After sunset	

On 16 September Mercury will be within half a degree of Mars, low in the east before sunrise.

Venus is the “Evening Star” in the west from the beginning of the year, and reaches greatest eastern elongation on 12 January. It is at inferior conjunction on 25 March and reappears as the “Morning Star” in April in the eastern pre-dawn sky, and maximum western elongation on 03 June. The best views will be in September. Then it gets lower in the sky as it heads towards superior conjunction in early January 2018. It will appear close to Mars on 05 October, and to Jupiter on 13 November 2017.

Early in the year **Mars** is visible in the south-west evening sky. It will disappear in April as it heads towards superior conjunction on 27 July. It will reappear in October as a pre-dawn object in the east. Being then 2.5 AU from Earth it will be faint and tiny – less than 4 arc-seconds in size – with no surface detail apparent. We will have to wait for its next excellent opposition – on 27 July 2018.

At the beginning of the year **Jupiter** is a morning object, rising around 1.00 am. By March it will rise at 10.30 pm. It reaches opposition on 07 April in Virgo, and will remain an evening object until September. It will reach conjunction with the Sun on 26 October, and in mid-November it will reappear in the pre-dawn morning sky in the east.

During the summer we can again expect to see 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 on the *Sky & Telescope* website (register at <http://tinyurl.com/24kp25> and remember to enter the date in the US format: month/day/year). They can also be simulated on software such as StarryNight (<http://www.starrynightstore.com/>),

and some of the many astronomy apps, including the *JupiterMoons* app 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/>.

Saturn starts the year as a morning object, rising in the east in the constellation Ophiuchus about 07.30 am, and rising earlier as the months go by. Opposition is on 15 June, the planet rising as the Sun sets, and visible all night. It will remain visible, progressively as an evening object, until October, reaching conjunction with the Sun on 21 December. Its declination is again low this year, so again it will remain at a low altitude. However, with the rings still at a good angle it will continue to present a beautiful sight in telescopes, and its brightest moons, especially Titan, should be visible.

Uranus will be at opposition in Pisces on 19 October, at around magnitude 6. **Neptune** will be at opposition in Aquarius on 05 September, at magnitude 8.

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 2016 there were three, but this year there will be just one – on 03 December.

DWARF PLANETS AND ASTEROIDS

Pluto will reach opposition on 10 July in Sagittarius, at magnitude 14. **Ceres** does not reach opposition until January 2018. 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 21 January 2017, when it will be magnitude 6 in Cancer. January and February will, therefore, be a good time to observe it.

ECLIPSES

On 26 February an annular solar eclipse will be visible from South America and Africa.

On the night of 10/11 February a penumbral eclipse of the Moon will be entirely visible from Guernsey. It starts at 22.32 UT and ends at 02.55 UT, maximum eclipse being at 00.44 UT. The Moon will pass close to and within the lower edge of the Earth's shadow, so the dimming effect is unlikely to be very marked.

A partial lunar eclipse on 7 August will be visible from Eastern Europe, Africa, Asia and Australia. In Guernsey none of the umbral phase will be visible, but the Moon will still be in the penumbra as it rises at 20.33 BST. The eclipse ends at 21.52 BST.

A major total solar eclipse, referred to as the Great American Eclipse, occurs on 21 August, the path of totality completely crossing the United States, and being visible, therefore, to many millions of people. In Guernsey it will be briefly visible (if you are quick!) as a minor partial eclipse, starting half an hour before sunset, at 19.41 BST. Maximum eclipse of just 13% is at 20.08, and the Sun sets at 20.12. To see it one will need a good view of the western horizon. The event may, however, provide good imaging opportunities, with some foreground objects providing added interest. If you are really keen take a trip to the US there are lots of information at <http://eclipse2017.nasa.gov/> and <http://mreclipse.com/Special/SEnext.html>.

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 AND CONJUNCTIONS

There will be a grazing occultation of Aldebaran by the Moon on 05 February, at 22.20 UT. It will be 0.3° from the Moon on 5 March at 03.40 UT. Aldebaran will be totally occulted by the Moon on 31 December from 01.18 to 01.53 UT.

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

01 January	Mars and Neptune	Evening in the west	0.3°
13 January	Venus and Neptune	Evening in the west	0.9°
27 February	Mars and Uranus	Evening in the west	0.7°
16 September	Mercury and Mars	Morning in the east	0.5°
05 October	Venus and Mars	Morning in the east	0.3°
13 November	Venus and Jupiter	Morning in the east	0.3°

METEORS

The **Quadrantids** peak on the night of 03/04 January. The Moon will be a few days old, so the morning hours should be dark. The **Perseids** peak on the night of 12/13 August, with up to 80 per hour. The waning gibbous Moon rises at 11.00 pm BST, affecting the visibility of the fainter morning meteors. The richest annual shower, the **Geminids** peaks on the night of 13/14 December. The waning crescent Moon will not rise until 2.45 am UT, so most of the night should be favourable.

There are, of course, minor meteor showers during the year, and sporadics may be seen at any time.

COMETS

Comet 45/P Honda-Mrkos-Pajdusakova has a perigee of 0.08 AU on 11 February, and could become a binocular object.

Comet 41/P Tuttle-Giacobini-Kresak will approach just 0.14 AU to the Earth in late March, shortly before it reaches perihelion on 11 April, and could well become a naked-eye circumpolar object at that time, possibly even reaching 2nd magnitude. It may be a binocular object from March to June.

Comet 2/P Encke reaches perihelion on 10 March at 0.336 AU from the Sun. It will be best seen in February low in the west after dark, when it could reach magnitude 5.

Comet 96/P Machholz reaches perihelion on 28 October at 0.12 AU from the Sun and could reach magnitude 2.

Detailed comet predictions for 2017 are available on the website of the British Astronomical Association's Comet Section: <http://www.ast.cam.ac.uk/~jds/preds17.pdf>. Also check the Heavens-Above website (heavens-above.com) for star charts showing comet positions.

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, 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.

EQUINOXES AND SOLSTICES

The following are the dates and times of the equinoxes and solstices in 2017:

Vernal Equinox	20 March	10.30 UT
Summer Solstice	21 June	05.25 BST
Autumnal Equinox	22 September	21.03 BST
Winter Solstice	21 December	16.29 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, linked from our webpage 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 02 February to 09 March. It is usually over-subscribed, so early enrolment is recommended. See 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 Thursday during the summer school holidays (27 July to 31 August). Details will appear on our website and will be sent to the local media.

REFERENCES

SkyMap Pro and *Starry Night Pro* software

<http://www.seasky.org/astronomy/astronomy-calendar-2017.html>

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

RAS diary 2017

CALENDAR OF ASTRONOMICAL EVENTS IN 2017

Month	Date	Time	Event
January	01	Evening	Mars and Neptune conjunction (0.3°)
January	03/04		Quadrantid meteor shower (favourable)
January	04	14.18 UT	Earth at perihelion

January	12	Evening	Venus at greatest eastern elongation
January	13	Evening	Venus and Neptune conjunction (0.9°)
January	19	Before sunrise	Mercury at greatest western elongation
January	21	All night	Vesta at opposition (mag 6)
February	02	19.30 UT	WEA course starts at Observatory
February	05	22.20 UT	Grazing occultation of Aldebaran by Moon
February	10/11	22.32 – 02.55 UT	Penumbral lunar eclipse
February	11		Comet 45/P HMP at perigee
February	27	Evening	Mars and Uranus conjunction (0.7°)
March	09	19.30 UT	WEA course – final class
March	10		Comet 2/P Encke at perihelion
March	20	10.30 UT	Vernal Equinox
Late March			Comet 41P TGK at perigee
March	25		Venus at inferior conjunction
March	26	01.00 UT	BST starts
April	01	After sunset	Mercury at greatest eastern elongation
April	07	All night	Jupiter at opposition
May	17	Before sunrise	Mercury at greatest western elongation
June	03	Morning	Venus at maximum western elongation
June	15	All night	Saturn at opposition
June	21	05.25 BST	Summer Solstice
July	03	21.11 BST	Earth at aphelion
July	10	All night	Pluto at opposition (magnitude 14)
July	27	Evening	Observatory Open Evenings start
July	30	After sunset	Mercury at greatest eastern elongation
August	07	Evening	Penumbral lunar eclipse
August	12/13		Perseid meteor shower
August	21	Before sunset	Partial solar eclipse (13%). Total in USA.
August	31	Evening	Observatory Open Days end
September	05	All night	Neptune at opposition (magnitude 8)
September	12	Before sunrise	Mercury at greatest western elongation
September	16	Before sunrise	Mercury and Mars conjunction (0.5°)
September	22	21.03 BST	Autumnal Equinox
October	05	Before sunrise	Venus and Mars conjunction (0.3°)
October	19	All night	Uranus at opposition (magnitude 6)
October	26		Jupiter conjunction with Sun
October	28		Comet 96/P Machholz at perihelion
October	29	02.00 BST	BST ends
November	13	Morning	Venus and Jupiter conjunction (0.3°)
November	24	After sunset	Mercury at greatest eastern elongation
December	03	All night	Supermoon
December	13/14		Geminid meteor shower (favourable)
December	21	16.29 UT	Winter Solstice
December	21		Saturn conjunction with Sun
December	31	01.18 – 01.53	Occultation of Aldebaran by Moon