La Société Guernesiaise Astronomy Section

Astronomical events in 2020

as seen from Guernsey

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A disappointing year for eclipses, but we do have a good Mars opposition to look forward to, as well as a grazing pass of Vesta with a star, and a very close conjunction of Jupiter and Saturn.

PLANETS

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

Date	Elongation	Direction	Time
10 February	18º Eastern	Low in West	After sunset
24 March	28º Western	Low in East	Before sunrise
04 June	24º Eastern	Low in West	After sunset
22 July	20º Western	Low in East	Before sunrise
01 October	26º Eastern	Low in West	After sunset
10 November	19º Western	Low in East	Before sunrise

Venus will start the year as the "Evening Star" low in the south-western sky after sunset, and getting higher in the sky until 24 March when it reaches greatest eastern elongation (46º). It will be at inferior conjunction on 03 June, and will then become the "Morning Star" in the east before sunrise, reaching greatest western elongation (46º) on 13 August. It will remain visible in the morning for the remainder of the year.

At the beginning of the year **Mars** will be visible in the east in the morning before sunrise, and will then rise earlier and earlier, rising at sunset when it is at opposition on 13 October. It will remain a good evening object for the remainder of the year.

This year's opposition of Mars will be a good one, although not quite as good as that in 2018. It will be 63 million km (39 million miles) away, and have a diameter of 22 arc-seconds. Although Mars oppositions occur every two years, close oppositions of Mars occur with a cycle of 15 to 17 years, and the next good one will not be until 2035, so make the most of this one!

Jupiter will rise in the east just before sunrise in January, but will rise progressively earlier, reaching opposition on 14 July in Sagittarius. It will then remain an evening object for the rest of the year. It will be accompanied by Saturn, the two planets making a very close approach to each other of just 6 arc-minutes on 21 December.

When Jupiter is visible 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 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 2020 BAA Handbook (pages 69-78). They can be simulated on software such as StarryNight (http://www.starrynightstore.com/), and some of the many astronomy apps, some of 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 closely follows Jupiter across the sky throughout the year, and they should make a lovely pair, although never rising higher than about 18 degrees. It reaches opposition on 20 July. The rings are still at a good angle for observation, and its brightest moons, especially Titan, should also be visible.

Uranus will be at opposition in Aries on 31 October, at magnitude 5.7. **Neptune** will be at opposition in Aquarius on 11 September, at magnitude 7.8.

PHASES OF THE MOON

New Moon	First Quarter	Full Moon	Last Quarter
	Jan 03	Jan 10	Jan 17
Jan 24	Feb 02	Feb 09	Feb 15
Feb 23	Mar 02	Mar 09	Mar 16
Mar 24	Apr 01	Apr 08	Apr 14
Apr 23	Apr 30	May 07	May 14
My 22	May 30	Jun 05	Jun 13
Jun 21	Jun 28	Jul 05	Jul 12
Jul 20	Jul 27	Aug 03	Aug 11
Aug 19	Aug 25	Sep 02	Sep 10
Sep 17	Sep 24	Oct 01	Oct 10
Oct 16	Oct 23	Oct 31	Nov 08
Nov 15	Nov 22	Nov 30	Dec 08
Dec 14	Dec 21	Dec 30	

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 2020 there will be four such moons: on 09 February, 09 March, 08 April and 07 May.

DWARF PLANETS AND ASTEROIDS

Pluto will reach opposition on 15 July, in Sagittarius just 1.5 degrees from Jupiter, at magnitude 14.2. **Ceres** will be at opposition on 28 August in Aquarius, with magnitude 7.2. The other three dwarf planets (Eris, Makemake and Haumea) are too faint to be seen in most amateur telescopes.

The brightest asteroid, Vesta, will be visible, but does not reach opposition this year. However, it is predicted to have a close stellar pass on 11 February (see below under Occultations).

ECLIPSES

This is a poor year for eclipses, with just three penumbral lunar eclipses and not solar eclipses visible from Guernsey.

On 10 January the Moon will undergo a penumbral eclipse, all of which will be visible from Guernsey. It starts at 17.05 and ends at 21.14, maximum eclipse will be at 19.10. On 05 June there will be another penumbral lunar eclipse, but only the last hour will be visible, from moonrise at 21.02 until 22.06 BST. And there will be a third penumbral lunar eclipse on 05 July, but again only an hour will be visible, from 04.04 to moonset at 05.07 BST. A fourth such eclipse, on 30 November, will not be visible from here.

An annular solar eclipse on 21 June will not be visible from Guernsey, being seen only from central East Africa and the southern part of Asia, including northern India. A total solar eclipse on 14 December will only be visible from Chile, Argentina, the South Pacific and South Atlantic.

OCCULTATIONS

The brightest (7th magnitude) asteroid Vesta is predicted to occult the 6th magnitude star HIP14439 on 11 February at 21.58 UTC, but from Guernsey it appears that it will be a very close pass (3 arcseconds) to the star at 22.27, as modelled on *StarryNight*. It may well be possible to see movement of the asteroid as it passes the star. It will be at an altitude of 24º in the west. Of course, although the two objects will appear close to each other they are at vastly different distances. Vesta will be about 2.5 astronomical units (about 20 light-minutes) away, while the star's distance is over 300 light-years.

LUNAR CONJUNCTIONS

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

01 August	Jupiter	Low in south in evening	2.5°
09 August	Mars	Low in south before sunrise	2.5°
06 September	Mars	Low in south-west before sunrise	0.6°
03 October	Mars	Low in west before sunrise	1.0°

PLANETARY CONJUNCTIONS

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

27 January	Venus and Neptune	South-west after sunset	0.1º
20 March	Mars and Jupiter	Low in south-east before sunrise	0.7º
21 December	Jupiter and Saturn	Very low in south-west after sunset	0.1º

METEORS

The **Quadrantids** will peak on the night of 03/04 January, with about 10 per hour, the Moon at First Quarter will be quite favourable. The **Perseids** will peak on the night of 12/13 August, with some 80 per hour, and with the Moon at Last Quarter will again be quite favourable. The richest annual shower, the **Geminids,** will peak on the night of 13/14 December, and the New Moon will make for very good visibility.

There are, of course, minor meteor showers during the year, and sporadics may be seen at any time. For shower details see the 2020 BAA Handbook, pp99-101.

COMETS

Comet C/2017 T2 PANSTARRS is well-placed for observation as a circumpolar object during the first few months of the year, and may just reach naked-eye visibility (magnitude 6) in May, when it will be at perihelion.

Periodic comet 88P/ Howell is conveniently placed for early morning observation until June. It reaches perihelion in late September, but will then be a southern hemisphere object, although it may be visible as a 9th magnitude object in the early evening low in the south-east..

Detailed comet predictions for 2020 are available on the website of the British Astronomical Association's Comet Section: http://www.ast.cam.ac.uk/~jds/preds20.pdf. Also check the Heavens-Above website (heavens-above.com) for star charts showing comet positions, and use programs such as StarryNight for detailed location charts.

THE SUN

There has been a dearth of sunspots since the last solar maximum in 2014, which was a not significant one. However, the new solar cycle appears to have started, so we can hopefully see a

progressive increase in sunspots as we head towards the next solar maximum in about five years. There can be outbursts of activity, not only of sunspots but also of coronal holes and coronal mass ejections, which can result in 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 2020:

Vernal Equinox	20 March	03.49 UTC
Summer Solstice	20 June	22.43 BST
Autumnal Equinox	22 September	14.30 BST
Winter Solstice	21 December	10.02 UTC

SATELLITES

The International Space Station (ISS) is regularly visible from Guernsey, looking like a very bright star crossing our skies from west to east. With the decommissioning of Iridium satellites flashes from them are now quite rare. 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.

ASTRONOMY COURSES

The Astronomy Section's annual six-week "Star Gazing" course at the Observatory will be run from 06 February to 12 March. It is usually over-subscribed, so early enrolment is recommended. This year the Section will be running it itself, rather than through the WEA which it has done for the past 18 years. See our website (www.astronomy.org.gg) and Facebook page (https://www.facebook.com/AstronomyGuernsey).

Additional courses may be run during the year, including astrophotography courses.

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 (23 July to 27 August). Details will appear on our website and will be sent to the local media. This year the summer open evenings will start a half-hour early during which there will be a presentation about historical Guernsey astronomers, as part of *Heritage75*.

Further open days for observing the Sun will most likely be held. And there will probably be an open evening in October.

REFERENCES

SkyMap Pro and *Starry Night Pro* software
General: http://www.seasky.org/astronomy/astronomy-calendar-2020.html
http://astropixels.com/ephemeris/astrocal/astrocal2020gmt.html
http://www.timeanddate.com/
Equinoxes, etc: https://www.weather.gov/media/ind/seasons.pdf
Royal Astronomical Society diary, 2020
The Handbook of the British Astronomical Association, 2020

CALENDAR OF ASTRONOMICAL EVENTS IN 2020

Month	Date	Time	Event
Jan- Jun			Comet 88P/Howell
January	03/04		Quadrantid meteor shower (favourable)
January	05	07.49 UTC	Earth at perihelion (147,091,144 km)
January	10	Evening	Penumbral lunar eclipse
January	27	After sunset	Venus and Neptune conjunction (05.1º)
February	06	19.30 UT	Star gazing course starts at Observatory
February	09	All night	Supermoon
February	10	After sunset	Mercury at greatest eastern elongation
February	11	21.58 UTC	**Vesta close to star HIP14439.**
March	09	All night	Supermoon
March	12	19.30 UT	Star gazing course – final class
March	20	03.51 UTC	Vernal Equinox
March	20	Before sunrise	Mars and Jupiter conjunction (0.7º)
March	24	Before sunrise	Mercury at greatest western elongation
March	24	Evening	Venus at greatest eastern elongation (46º)
March	29	01.00 UT	BST starts
April	08	All night	Supermoon
May	07	All night	Supermoon
May			Comet C/2017 PANSTARRS at perihelion
June	04	After sunset	Mercury at greatest eastern elongation
June	05	Evening	Penumbral lunar eclipse
June	20	22.45 BST	Summer Solstice
July	04	12.56 BST	Earth at aphelion (152,095,296 km)
July	05	Before sunrise	Penumbral lunar eclipse
July	14	All night	Jupiter at opposition
July	15	All night	Pluto at opposition (magnitude 14.2)
July	20	All night	Saturn at opposition
July	22	Before sunrise	Mercury at greatest western elongation
July	23	Evening	Observatory Open Evenings start
August	01	After sunset	Jupiter conjunction with Moon (2.5º)
August	09	Before sunrise	Mars conjunction with Moon (2.5º)
August	12/13		Perseid meteor shower (favourable)
August	13	Morning	Venus at greatest western elongation (46º)
August	27	Evening	Observatory Open Days end
August	28	All night	Ceres at opposition
September	06	Before sunrise	Mars conjunction with Moon (0.6º)
September	11	All night	Neptune at opposition (magnitude 7.8)
September	22	14.32 BST	Autumnal Equinox
October	01	After sunset	Mercury at greatest eastern elongation
October	03	Before sunrise	Mars conjunction with Moon (1.0º)
October	13	All night	**Mars at opposition**
October	25	02.00 BST	BST ends
October	31	All night	Uranus at opposition (magnitude 5.7)
November	10	Before sunrise	Mercury at greatest western elongation
December	13/14		Geminid meteor shower (favourable)
December	21	After sunset	Jupiter and Saturn conjunction (0.1º)
December	21	10.04 UT	Winter Solstice