

# SKYMATTERS

Blackrock Castle Observatory [www.bco.ie](http://www.bco.ie)  
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**2020**

## Things to watch out for

### January 3/4

The Quadrantids Meteor shower falls on these dates this year. It is an above average shower, with up to 40 meteors per hour at its peak. This shower runs annually from January 1st to the 5th, but will peak on the 3rd and 4th. The first quarter Moon will set shortly after midnight, leaving dark skies for observing. Meteors will radiate from the constellation Boötes, but can appear anywhere in the sky.

### January 10

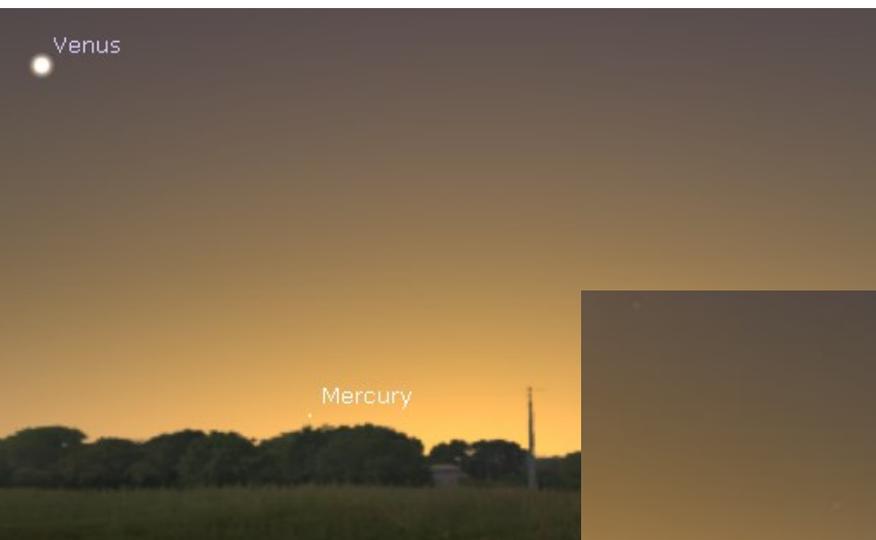
The Full Moon will fall on this date in January. The Moon will be located on the opposite side of the Earth as the Sun and its face will be fully illuminated. This will be the first Full Moon of the year. The light of a Full Moon can interfere with observations of fainter astronomical objects such as galaxies, but it is also the only phase in which lunar eclipses are possible (see next point).

### January 10

A Penumbral Lunar Eclipse will occur on this date. A penumbral lunar eclipse occurs when the Moon passes through the edge of Earth's shadow, or penumbra. The center of a shadow is the umbra. During this type of eclipse the Moon will darken slightly but not completely. The eclipse will be visible throughout most of Europe, Africa, Asia, the Indian Ocean, and Western Australia. This eclipse will be visible in Ireland, it should appear as though the lower half of the Moon is darkening and taking a slightly red hue. This will occur early in the night, soon after moonrise.

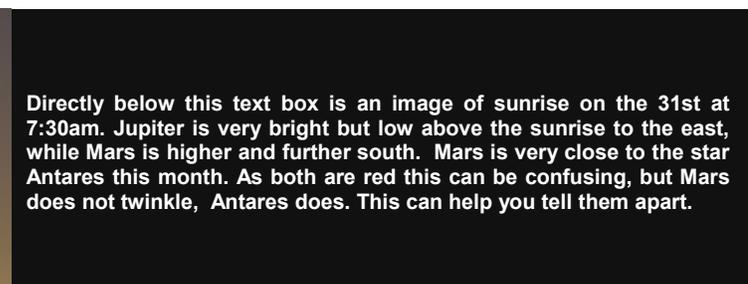
### January 24

The New Moon will fall on this date. The Moon will be located on the same side of the Earth as the Sun and will not be visible in the night sky. Due to the lack of moonlight, this is the best time of the month to observe faint objects such as galaxies.



Venus

Mercury



Directly below this text box is an image of sunrise on the 31st at 7:30am. Jupiter is very bright but low above the sunrise to the east, while Mars is higher and further south. Mars is very close to the star Antares this month. As both are red this can be confusing, but Mars does not twinkle, Antares does. This can help you tell them apart.



Jupiter

Mars

Directly above this text box is an image of sunset on the 30th of this month, at 5:45pm. Mercury is just barely visible above the sunset, while Venus is high and bright to the south-west and is much more visible.



The above rightmost image is an image of the recently renamed Arrokoth, thought to have formed when two smaller bodies collided, it is currently the most distant object in our solar system to have received a fly-by, in this case from the New Horizons probe. The left most image is of the asteroid Bennu, which the NASA OSIRIS-Rex mission is hoping to take a sample from this year.

## Upcoming and Updates

Firstly, an update a few missions mentioned in the January 2019! The Japanese mission to take a sample from the Ryugu asteroid was successful! The Hayabusa2 spacecraft is on its return journey to the Earth. The New Horizons spacecraft has taken images of the most distant solar system body yet, formerly nicknamed Ultima Thule but now officially called Arrokoth. While the Vector and Firefly Rockets have yet to launch, SpaceX has moved far beyond the Falcon 1 to the Falcon 9 and the Electron rocket has delivered several CubeSats to orbit. While neither the SpaceX Crew Dragon nor the Boeing CTS-Starliner have brought a crew to the ISS last year, they may do so this year.

Some of the above run into missions happening this year, such as the Hayabusa2 spacecraft returning with a sample. NASA's OSIRIS-Rex mission is hoping to get a sample of the asteroid Bennu this year. China is hoping to get and return a sample from the Moon with its Chang'e 5 mission. Crewed tests of both the SpaceX Crew Dragon and the Boeing CTS-Starliner are expected, as mentioned above, while the Chinese space agency intends to launch the core module of its next space station. This core module is the Tianhe and is intended to be the first of several modules that will eventually form a space station similar in size to the now decommissioned Russian Mir space station.

There are also several planned missions to Mars, including NASA's Mars 2020 rover, which is intended to bring a helicopter unmanned aerial drone and get samples that may eventually be returned to the Earth. ESA and Roscosmos plan to launch the Rosalind Franklin rover while China hopes to launch a rover and orbiter in its HX-1 mission. The United Arab Emirates intends to launch an orbiter to Mars in the Hope Mars mission.

Further developments in rocketry include the planned SpaceX test of their fully reusable Starship two-stage rocket system. Arianespace is aiming to launch the Ariane 6, which is intended to be a similar cost to the SpaceX Falcon 9, while Mitsubishi Heavy Industries is intending to launch its new H3 launch vehicle, intend to be half as expensive as its predecessor. There are tentative dates for over 20 rocket launches already set for 2020 with twice as many planned launches with dates to be announced.

One of the most controversial expected developments is the deployment of satellite constellations, large groups of small satellites in low Earth orbit intend to provide high speed internet access and potentially Earth observation as well. SpaceX has already launched some of the satellites in its planned Starlink satellite constellation. It intends to have 720 satellites in orbit by the end of 2020. OneWeb is another company hoping to deploy a satellite constellation, hoping to have their system operational in late 2020 once 300 satellites are in orbit, though they plan to grow the constellation to over 600. If both companies succeed in their plans, we could be looking at over 1000 new low Earth satellites by the end of next year, without counting the many other planned satellite launches. Many astronomers have issued concerns that these satellites could interfere with scientific observations of space, both in visual light and in the radio frequencies these satellites use to communicate with each other and the ground. We may not know the exact effect of these many new satellites until they are launched.



## Tips for Facilitating your Astronomy

As the New Year begins, many people are making resolutions and promises to themselves about how they are going to act in the following months. I'm sure most of you are making resolutions to do more astronomy and see more objects. Here are some ways to facilitate that.

First, having to go running around for a telescope or digging your binoculars out of the attic can be discouraging. Instead of vowing to use your telescope more, move it somewhere more easily accessible, or set it up indoors looking out a window. If it is already there, it is that little bit more likely to be used.

Secondly, keep a small telescope or binoculars handy. If you are commuting in the dark, as many of us are in early January, toss a pair of binoculars into the car or into your work/school bag. If you can pull out your binoculars while waiting for the bus or waiting for the car to heat up, it uses time that you already have, without trying to cram observing into an already packed schedule.

Lastly, try to accomplish more than one goal. Many people resolve to spend more time outside, more time with their families or more time appreciating nature and the universe. A little bit of stargazing can accomplish all those goals. If you want to spend less time on your phone or build in some decompression time where you are separated from work, committing that time to astronomy to give you something to do when not on your phone, something to distract you from thoughts of work.

It can be hard to keep resolutions, so try to make it easy on yourself.

## Website of the month

[wikiquote.org](http://wikiquote.org)

Wikiquote is part of the Wikipedia family of online, community edited archives. It stores thousands of quotes on many topics. It has a particular improvement over most other quote archives: attribution. Not only is every quote attributed to an individual or group, but it also has a referenced source such as a book or interview, making them much easier to confirm.

## Quote of the month

*In omnibus autem negotiis priusquam adgrediare, adhibenda est praeparatio diligens.*

In all matters, before beginning, a diligent preparation should be made.

Cicero, *De Officiis* (44 B.C.), I, 21.

## Some Upcoming Events at CIT Blackrock Castle Observatory

**We start the New Year with a First Quarter Moon on the 2nd of January. Come join us here at Blackrock Castle Observatory between 4 and 5 o'clock to take a closer look with our telescopes!**

**We will be restarting our ever popular Junior Space Camp on Sunday the 2nd of February, but grab your space now if you are interested as they go fast!**

**If any of you have received a telescope as a present and want advice on how to set it up and use it, pop into us here, we are always happy to help.**

**PUBLIC OPENING Hours: 10am—5pm (Mon-Sun)**

**Phone: +353-21-4326120 / Email: [info@bco.ie](mailto:info@bco.ie)**

**Blackrock Castle Observatory is operated by Cork Institute of Technology and is a partnership with Cork City Council.**