

SKYMATTERS

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August 2021

Things to watch out for

August 2

Saturn reaches opposition on this date. This means that it is on the opposite side of the Earth to the Sun, similar to a Full Moon. Just like a Full Moon, this is when Saturn is at its brightest and it will stay in the sky all night long. This is also when Saturn is at its closest to the Earth, making it a perfect time to look at Saturn with a telescope.

August 8

The New Moon falls on this date this month. The Moon will be located on the same side of the Earth as the Sun and will not be visible in the night sky. This also means that there will be no moonlight to obscure fainter objects such as galaxies.

August 12/13

The Perseids Meteor Shower will peak on these dates this year. The Perseids is one of the best meteor showers to observe, famous for producing a large number of bright meteors. The shower runs annually from July 17 to August 24. but will peak the night of August 12 into the morning of the 13. The Moon will still be close to New, giving us a nice, dark sky to view the shower

August 19

Jupiter reaches opposition on this date. This means that it is on the opposite side of the Earth to the Sun, similar to a Full Moon. Just like a Full Moon, this is when Jupiter is at its brightest and it will stay in the sky all night long. This is also when Saturn is at its closest to the Earth, making it a perfect time to look at Jupiter with a telescope.

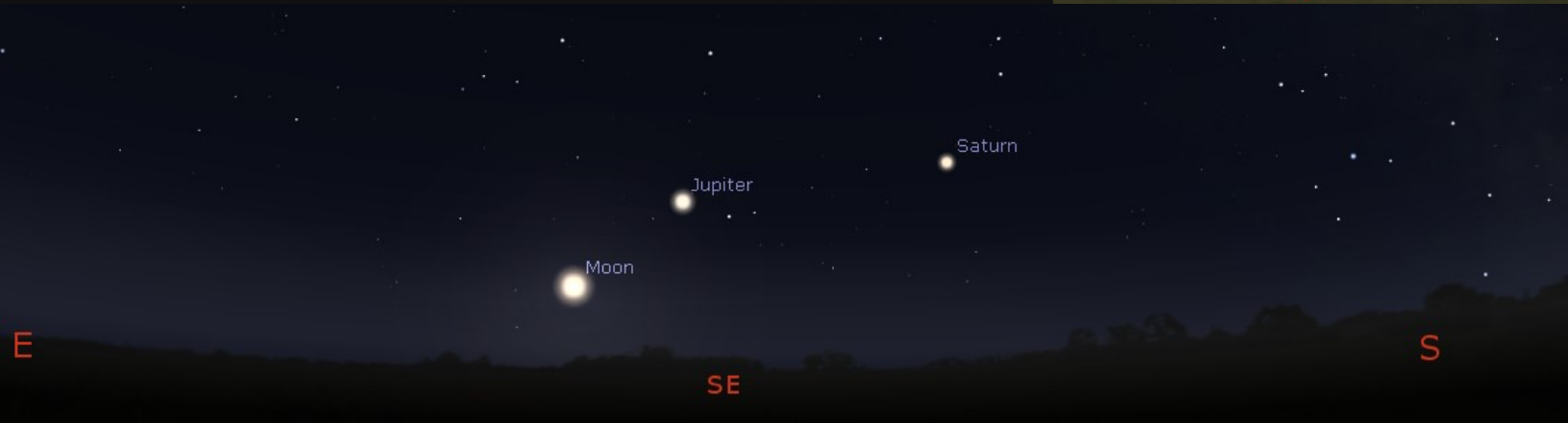
August 22

The Full Moon falls on this date this month. The Moon will be located on the opposite side of the Earth as the Sun and its face will be fully illuminated.

To the right, we see Sunrise on the 31st of August at 6 o'clock in the morning. The famous constellation of Orion is now clearly visible as the sunrises in the morning, with the brightest star Sirius also visible closer to the horizon. It will be just ahead of the sunrise in the southeast.



Directly below is a view of Jupiter, Saturn and the Full Moon on the 22nd, seen here at 10:10pm. Jupiter and Saturn are continuing to be very visible, and this month they both come to opposition, making this a particularly good time to observe them. Although the Full Moon will contribute some light to the sky, the two giant planets are more than bright enough to remain visible.





Top left: The Blue Origins New Shepard Rocket (Credit: Blue Origins)
Top right: The SpaceX Starship (Credit: SpaceX)
Bottom Left: The Virgin Galactic SpaceShipOne and White Knight launch vehicle (Credit: Virgin Galactic)
Bottom right the registered/all rights reserved symbol. Many private companies do not release their images for use, credited or not. As can be seen, the above companies require that they be credited for there images to be used.

Bezos, Branson and Big Bucks

This year so far we have seen some huge leaps ahead in the field of private spaceflight. Not only did Richard Branson, the multimillionaire behind the Virgin Corporation, slip the surly bonds of Earth in his spaceplane, but Jeff Bezos, former trillionaire of Amazon fame, also crossed the Kármán line in a sub-orbital flight. Now we're just waiting on Elon, the billionaire behind SpaceX, Tesla and more to join the club, and all three of the worlds current space enthused mega-rich will have made it across the boundary between our little world and the rest of the Universe. And of course, the other nearly 8 billion of us can't be far behind.

It can sometimes be tough to watch these billionaires achieve their dreams. The fortunes that they have spent are built from all of our purchases, every Virgin Airlines flight you take and every Amazon purchase you make adds to the wealth being spent on these personal dreams. We are lucky that all progress is a contribution. We now know that a spaceplane launched from the air can reach suborbital flights, thanks to Virgin Galactic, and Jeff Bezos has proved, to much public surprise, that yes, rockets could get even more phallic. They may have been the first private passengers, just as the first passengers of the earliest planes and cruise ships were part of the wealthy elite, but just as any of us today can fly to another country or hop onto a ferry or cruise, soon we may have the opportunity to fly to the edge of space. Unfortunately, right now, space is the destination, and it is a rather short visit, just a few minutes of micro-gravity and a brief view of the Earths thin blue shell of atmosphere. Most other forms of transportation have a destination here on Earth, with the beautiful views from above the clouds or across the waves being a simple bonus, a lovely side effect of the form of transport. Currently, sub-orbital flights will bring you back down pretty close to where you started.

This is where Elon Musk may outperform the others. There is some interest in using sub-orbital flights for long-range travel, using rockets to cross the Atlantic or even the Pacific in just an hour or so. This would give the same beautiful view and unique experience of weightlessness, with the added benefit of actual transport from one location to another. However, that is still untested, and whether or not it proves efficient and environmentally friendly still remains to be seen. Of course, most people are more excited at the proposition of space travel to other planets and our Moon. Space travel, for many people, should have a destination in space, rather than back here on Earth. That may still be quite far away. Even national organisations haven't brought a human to another body in decades, and the next planned visit is till a few years away, potentially further if we are waiting for a private mission.

So despite the great leaps and bounds made by private individuals, it may be sometime yet before the science fiction of holidays to other planets becomes a reality. However, if you want a very short holiday, or a particularly luxurious roller coaster ride, we are certainly on our way. Once the private trips of Bezos and Branson become more publicly accessible, we may only be a year or two away from an affordable ticket to the edge of space, and with that, one step closer to true space tourism.



The two top maps show the participation in the Outer Space Treaty, on the left, and the Moon Treaty on the right. Both of those treaties are maintained by the United Nations, whose flag is displayed as the bottom image.

Space Law and Treaties

So far, there are some laws regarding space which everyone seems to agree with. The first set of laws to be accepted by many countries was the Outer Space Treaty. This treaty essentially banned the use of nuclear weapons in space, as well as establishing that no state or nation can claim space or any body in it, such as the Moon, as their territory. 111 United Nations member states have agreed to this treaty, and although it did make strides to ban military actions on bodies such as our Moon, non-nuclear weapons in space are still allowed, as is asteroid mining and space tourism. Granted, this treaty was written in the 1960's, and so many of our more modern concerns hadn't been truly considered. At that time, we hadn't yet successfully landed on the Moon. The treaty also stated that any object launched into space remains the property of the launching state and that state is liable for any damage it causes. The Outer Space treaty was certainly a good start, but as space exploration became more common, more laws needed to be created and agreed upon. Creating the laws turned out to be the easy part.

Shortly before the first Moon landing, the Rescue Agreement was added as a follow up to the Outer Space Treaty. Essentially, this shares the responsibility, for rescuing astronauts or salvaging damaged spacecraft, with every member state of the treaty. If a space ship crashes in your country, it is your country's duty to salvage the craft and return it to the country that launched it, who are then obligated to offer compensation. The agreement includes "spacecraft personnel" as well as astronauts, meaning passengers of private flights such as Virgin Galactic are also entitled to rescue. This agreement has been signed by 98 states so far, including the states capable of going to space.

The subsequent Liability Convention added detail to who is at fault if a joint launch involving 2 countries fails, and what framework to follow if an individual has been effected. Claims of liability related to space are only between states, so a state will need to represent any of its citizens in claims against other countries. Signed by 96 countries so far, this Convention proved useful when a nuclear powered Soviet satellite crashed in Canada, where it facilitated Canada's claims of damages against the USSR. This was followed by the Registration Convention, which simply holds that any launched object must be registered with a central body. This helps to keep track of who launched what and when, especially as the number of satellites orbiting the Earth continues to grow. Although only signed by 71 states, that still includes all nations with the capacity to launch something.

This most recent treaty is the Moon Treaty. This expands on the Outer Space treaty, mainly by declaring the Moon to be part of the "common heritage of all mankind". This essentially means that no one country or private entity can lay claim to the Moon or its resources as their property. The treaty also mandates the creation of co-operative regime of mining organised among the member states. The treaty essentially functions to ensure that the Moon's resources are distributed across humanity, rather than becoming the sole property of the state or company that mined them. This could help to prevent a "goldrush", where many companies dispute the best areas and rush in to take what they can, and it would also help prevent a wealthy nation extracting the Moon's water ice and then selling the water to countries experiencing drought. Of course this treaty has only been signed by 18 states, none of whom currently have the capacity to launch into space. Some leaders declared that the treaty constrain "free enterprise", and that risk was not worth committing to international agreement. Truly unified space law may still be some way off.

Tips for Engaging with Policy

Space policy, the laws and agreements that countries make regarding activities in space, effect relations between countries most of all, but represent the citizens of each state as well. The policies that, for example, Ireland adopts reflects the opinions of all of Ireland's citizens. Or, at least it should, but for policy to reflect your thoughts you need to make them heard.

As with most modern states, Ireland has a space policy, the National Space Strategy for Enterprise, which focuses on the involvement of Irish companies with the European Space Agency. If you believe that your company may have a possible way to contribute to ESA projects, there are groups within Enterprise Ireland that can facilitate your involvement.

Currently, Ireland is a signatory of some of the treaties mentioned in the article overleaf. Furthermore, as Ireland's connection to space is through ESA, any treaties which ESA accepts effect Ireland through them. As ESA refuses to put nuclear weapons in space, it would be almost impossible for Ireland to circumvent them and place it's own nuclear weapons up there.

Importantly, the best way to initiate changes in governmental policy is by campaign, by contacting local representatives and speaking with others in your community. If every one in Ireland agrees that property on the Moon should be purchasable, than a change to policy needs to be organized to reflect that. Of course, as with all national policies, there is the potential for different groups to disagree over the best route to take. This is where debates and public forums become valuable, and a public forum on space policy can be arranged through local as well as national government

Website of the month

shanesutton.com

Shane Sutton is the current resident artist here at Blackrock Castle Observatory. Check out his art at the website above. You can also check out his new mural here at BCO, and pick up a TeddyBot, Shane's stuffed plush robot series, at our BCO shop!

Quote of the month

"The stars awaken a certain reverence, because though always present, they are inaccessible; but all natural objects make a kindred impression, when the mind is open to their influence. Nature never wears a mean appearance."

Ralph Waldo Emerson, Nature (1836) Ch. 1, Nature.

Some Upcoming Events at MTU Blackrock Castle Observatory

We are delighted to announce the creation of a new artwork here at BCO by our artist in residence Shane Sutton. The art piece is a mural inside the exhibit of the castle, designed to invoke the international nature of space as we move toward the future and space 4.0. You can see it by booking a visit to the Castle at our website below.

Public Opening Hours are subject to change due to COVID-19 mitigation measures.

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Blackrock Castle Observatory is operated by Munster Technological University and is a partnership with Cork City Council.