BLACKROCK CASTLE OBSERVATORY
The Space For Science

SKYMATTERS

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100 years of the International Astronomical Union

June 2019

Things to watch out for

June 3

The New Moon falls on this date in June. This means it will located on the same side of the Earth as the Sun and will not be visible in the night sky. This is the best time of the month to observe objects such as the Milky way because there is no moonlight to interfere.

June 10

Jupiter reaches Opposition on this date in June. The largest planet will be at its closest approach to Earth and its face will be fully illuminated by the Sun. It will be brighter than any other time of the year and will be visible all night long. This is the best time to view and photograph Jupiter and its moons. A medium-sized telescope should be able to show you some of the details in Jupiter's cloud bands. A good pair of binoculars should allow you to see Jupiter's four largest moons, appearing as bright dots on either side of the planet.

June 17

The Full Moon falls on this date in June. The Moon will be located on the opposite side of the Earth as the Sun and its face will be will be fully illuminated. The extra light of the Moon may block out faint objects on this date, but, as with Jupiter at Opposition, this is a great time to photograph the Moon

June 21

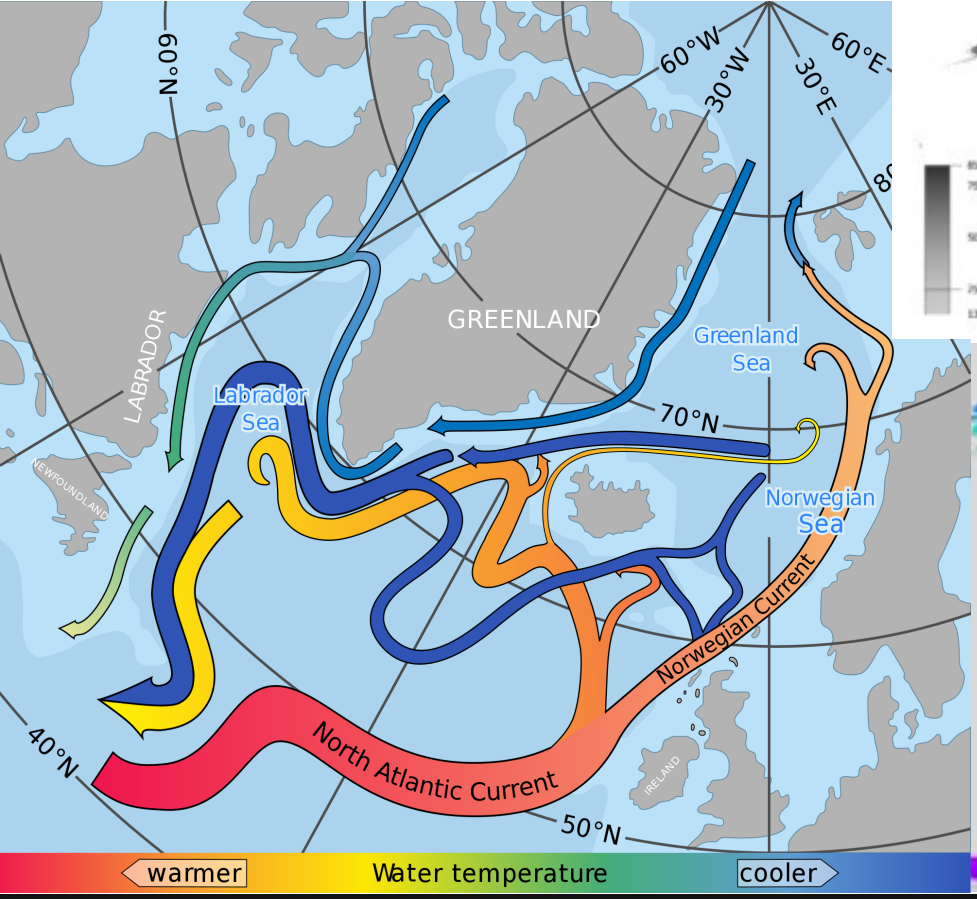
The June Solstice falls on this date this year. The June Solstice is the summer solstice for those of us in the Northern hemisphere and the winter solstice for those of us in the Southern hemisphere. Whether this marks the beginning of summer, the middle or some time between the two varies from place to place. However, the Solstice is generally considered the beginning of its season.

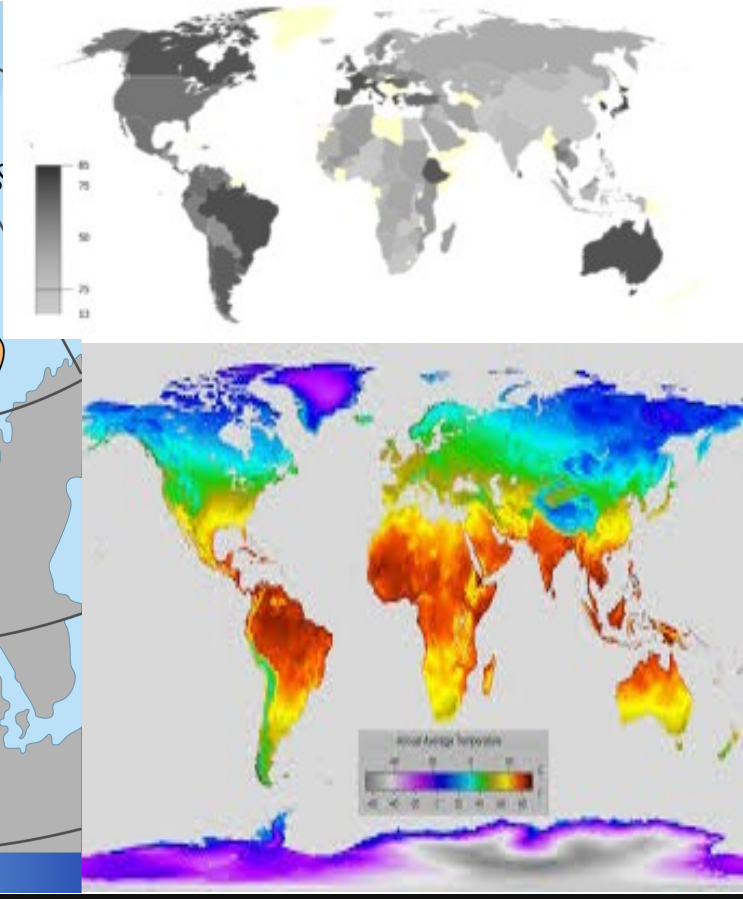
June 23

The planet Mercury reaches greatest eastern elongation on this date in June. This is the best time to view Mercury since it will be at its highest point above the horizon in the evening sky. Look for the planet low in the western sky just after sunset.

The image directly below shows sunrise at 4.50am on June 10. Jupiter is nice and clear to the south-west, while Saturn is a little faint by this time, higher and closer to the south. Venus is almost totally obscured by the rising Sun in the east, almost northeast. Saturn and Jupiter are a little easier to see earlier, while Venus is incredibly tough to spot all month, barely appearing above the horizon before sunrise blots it out.

The bottom image shows sunset at 10.40pm on June 10. Mercury and Mars are both visible to the northwest. They will remain visible all month long, although they will be visible for shorter periods at the end of the month. A Half Moon is high in the sky to the southwest while Jupiter is low, past the south almost in the southeast. Jupiter will be visible from sunset to sunrise this month as it is at opposition.





The left hand image shows some of the ocean currents close to Ireland, with the North Atlantic current being one of the most important, also known as the Gulf Stream . This current keeps Ireland a little warmer than other countries at our latitude, as can be seen on the map in the bottom right. The map on the top right shows different countries relative concern over climate change. Ireland is in a darker color, indicating general concern over the changing climate.

Breaking Records

2019 has already brought us some new records in various fields. Faster marathon times, bigger fireworks displays, we are always pushing ahead and doing more. We've landed on the far side of the Moon for the first time and have more missions to space, from more countries than ever before. Some records can be bittersweet, like the Opportunity rover's record breaking Mars mission. It drove across the red planet for a little over fifteen years, the longest ever functional stay on the surface of another planet. The records that we have broken and are set to break can sometimes be negative. Some of our weather records are even a little frightening.

Illinois set new record breaking cold temperatures this year, with Rockford hitting –35 degrees Celsius and Moline hitting –36.1. To balance these two record lows, the Southern hemisphere broke numerous record highs, with 35 new daytime records, including a scorching 49.5 degrees in Port Augusta in Australia. Australia also got it's hottest night, with temperatures staying above 35.9 degrees all night long in Noona, New South wales.

The Southern Hemisphere's summer comes before the Northern Hemisphere's each year, and can serve as a benchmark. If the south had higher temperatures, it is likely that we will too. Of course, Australia is a little closer to the equator than we are, so our temperatures (hopefully) won't soar quite as high, though the Mediterranean may see similar heatwaves to last year. The more southern reaches of Argentina are closer parallels to our latitude, and they too saw record breaking temperatures. Many parts of southern Argentina saw temperatures climb above 30 degrees for the first time ever. One of the most southern inhabited towns, Puerto Williams, saw temperatures of 29 degrees.

As we begin the steady progression from our wet and wild spring into summer, the events of the southern hemisphere may be a little foreboding. However, forewarned is forearmed. We know that weather has been getting hotter, so maybe this year is the year to take a trip to Sweden, Norway or Iceland to escape the heat. Maybe getting that air conditioning unit you thought about last summer, or an ice bath for kids and pets struggling in the heat. The southern hemisphere also contains less land than the North. The effects of extreme heat on cities and centres of population may be more obvious here.

What good, if any, can come from these extreme temperatures? They give us an opportunity to learn. With so many satellites staring down at Europe, each year we can better see the effects of the weather, and therefore, better plan for them in the future. As we learn where is hardest hit by droughts or floods, we can prepare for evacuations in advance and learn which areas to steer clear of.

We have broken a lot of records already this year, and although the coming months may present us with records we would rather not break, there are still records we can aim for. England shut off its coal power stations for a record length of time earlier this year. Maybe more records of that nature will reduce our record breaking heat.

Top left we have a close up of the Great Red Spot, a storm large enough to swallow two Earths that has been blowing for hundreds of years. Below that we have an image of Jupiter with its four largest moons visible and labeled. The right-hand image is a view of Jupiter showing its many stripes and spots. The bands of color are different components of its atmosphere visible at different latitudes, while the spots are vortex-like storms, similar to tornadoes and hurricanes.

Jupiter at Opposition

The largest planet in our solar system, Jupiter, will reach opposition this month. As mentioned on the first page, this brings Jupiter at its closest to the Earth , making it one of the best times to take a closer look at the planet.

Being at opposition means opposite the Sun, just like a Full Moon, and in the same way, any planet at opposition is visible from sunset to sunrise. This gives us a great range of times to look for the planet. It also means that the side facing us is fully illuminated, making the planet appear brighter in the sky. Jupiter is already the fourth brightest object in our sky, after the Sun, Moon and Venus. Venus won't be up for most of the month, which should help to make Jupiter more obvious. It will rise in the east each evening and set in the west every morning. You can tell it apart from the stars by the lack of twinkling, only stars go twinkle-twinkle.

You don't need a telescope to see Jupiter, but it is always nice to take a closer look at the planets. Whether your telescope is big or small, it is worth taking a closer look. Even small telescopes, only a few inches wide, can see the larger moons of Jupiter. Its four largest moons, Ganymede, Calisto, Io and Europa, were the first moons discovered orbiting another planet. They are often called the Galilean moons after their discoverer Galileo Galilei. These are the easiest moons to see as they are so large, with Ganymede rivalling the planet Mercury in size. As they orbit around Jupiter you can see different arrangements on different nights of the year.

Taking a closer look with a larger telescope will let you see the stripes. Jupiter's thick, gassy atmosphere contains many different compounds and different temperatures across the planet give cause different gases to rise to the top at different latitudes. None of the other planets have bands of colour as clear as those on Jupiter. Jupiter is particularly known for its huge storm, the Great Red Spot. Although this storm is well known, it isn't always visible from the Earth. Just like us, Jupiter rotates, but instead of a 24 hour day, Jupiter's is closer to ten. This quick rotation means the Great Red Spot only faces the Earth for five hours, before turning away from us for another five. If you really want to catch a look at this huge storm, it is best to go out two or three consecutive mornings or evenings at a similar time.

Jupiter's name comes from the Roman god of the same name, Similar to Zeus in Greek mythology. Jupiter (the god) was the leader of the Roman pantheon, the god of gods. Jupiter (the planet) is much bigger than any other in our solar system and has major effects on the solar system as a whole. Jupiter's mass pulls the Sun to-and-fro as it orbits and it is believed to keep the asteroid belt as asteroids, preventing them from bunching up into a new planet. The effect of Jupiter's gravity also helps to shield the inner planets from the onslaught of comets from further out in the solar system.

Jupiter is one of the nicest planets to view, with anything from your eyes up to the largest telescopes. This is the best time of the year to view Jupiter and is one of the months where we have fewer clouds. It's a great time to get more familiar with our biggest neighbour.

Tips for Citizen Science

The term citizen science has been floating around a lot lately, almost becoming a buzzword. It really means ordinary people either adding data to research or poring through data looking for certain things.

First, find a topic you are passionate about. Citizen science projects have popped up in astronomy, genetics, meteorology, computer science; almost every major field is opening up to the public in some way. Here at Blackrock, we're especially passionate about measuring dark skies, but you can find a variety of projects around the world.

Second, you'll need to see if you want to give data or take in data. Most dark sky citizen science involves measuring the light in your area, adding data to the archives of the International Dark Skies Association, giving more data to the researchers. The Kepler citizen science project means taking data from the Kepler space telescope and checking for dips in graphs of starlight that may indicate planets.

Whether you decide to give more data to the scientists or take their data and analyze it, you are giving more people power to the project. Adding a light meter detector the end of your garden may fill in a gap in the world's light pollution. Flicking through some Kepler light graphs might give you the chance to confirm or refute the existence of an exoplanet. Each person giving a little help adds up over thousands of people.

Lastly, push more of your fellow citizens to get involved. The more of us lend a hand, the more we can accomplish.

Website of the month

www.pwsweather.com/tools.php

Personal Weather Stations (PWMs) exist all over the world. No need to get a weather station in your countries capital to tell you the weather when a weather station down the road could give you a reading more accurate to your location. You can also add your stations data to the site to help others.

Quote of the month

Science doesn't purvey absolute truth. Science is a mechanism. It's a way of trying to improve your knowledge of nature. It's a system for testing your thoughts against the universe and seeing whether they match. And this works, not just for the ordinary aspects of science, but for all of life.

Isaac Asimov, Interview by Bill Moyers on Bill Moyers' World Of Ideas (21 October 1988)

Some Upcoming Events at CIT Blackrock Castle Observatory

Join Blackrock Castle Observatory at the Cork Harbour Festival! Some of our explainers will be at SeaFest village looking at the stars and talking about space under the light of the First Quarter Moon on the 9th of June, starting at 4:00pm.

Here at the Castle, we are still looking forward to July and the fiftieth anniversary of the Apollo 11 mission landing on the Moon. With talks and shows around the city as well as here at the castle itself, July looks to be a month jam-packed with space events.

If you can't make it out to the castle, we will have Stardome's at the St. Peter's Cork, North Main Street and Nano Nagle Heritage Centre on the 19th, 20th and 21st of July.

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

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

All Screenshots courtesy of Stellarium
Collated by Caoimhín de Bhailís and the Blackrock Castle Observatory team