WHAT'S UP IN MARCH

By Bernie Reim

The month of March is named for Mars, the Roman god of war, but it is also known as the guardian of agriculture and as an ancestor of the Roman people. March was also the first month of the year on the early Roman calendar.

For us in the northern hemisphere, March always marks the beginning of spring. This year that will happen at exactly 10:46 a.m. on Friday, March 20. This is also called the vernal equinox, when the sun on the ecliptic crosses upward over the celestial equator as it is moving north. The days and nights will be exactly 12 hours long everywhere on earth except for the poles on this day as well as the autumnal equinox around September 21 each year. The 12 hour days and nights actually occur a few days before the equinoxes because we orbit the sun in ellipses and not perfect circles and we are tilted at 23.44 degrees.

The sun does rise exactly due east and sets exactly due west for only 2 days each year on the both equinoxes for everyone on Earth except for the poles. The very next day the sun will rise a little farther north of east as we continue to the summer solstice on June 21 when the sun will reach its highest point in our sky and rises the farthest north of east and set the farthest north of west, giving us 15 and a half-hour-long days. For us at this latitude the sun will reach about 67 degrees high in our sky at noon on the meridian. That is our latitude plus the tilt of the earth.

This has been a longer and colder winter than we have been used to, but it is always nice to welcome spring back to our part of the earth. There are several great highlights this month that will be well worth braving any remaining cold weather and getting up early to experience. The major highlight by far for this month will be a total lunar eclipse starting during the morning of Tuesday, March 3 at full moon at 4:50 am EST. The penumbral phase of the eclipse actually starts at 3:43 am, but that part of the earth's shadow is too faint to see.

You can start seeing the umbral part of our shadow crossing over the moon starting at 4:50 am. Then watch carefully as the moon goes deeper and deeper into our shadow and some colors start appearing on the moon. The moon will be completely immersed in our shadow at 6:04am, but the sun will rise a few minutes later at 6:15 am, and the full moon always sets as the sun rises. Twilight starts about 40 minutes before then, so the sky will be too bright already to really see any of the nice deep red and orange colors that the moon will turn. The farther west you live, the more of this total lunar eclipse you will be able to see.

I have seen dozens of lunar eclipses. They can appear very different and they are always well worth making the effort to see and photograph for yourself, even if they are just partial. You really get a good sense of the 3-dimensional nature of the sphere of the moon during the eclipse with the unique shading on it as it passes through different parts of our shadow that is always there and stretches nearly one million miles into space. You could look at it as if the earth were always wearing a very long and thin and dark wizard's cap. The moon also has a wizard's cap, but it only stretches 240,000 miles into space and barely reaches the earth during total solar eclipses. That is why the path of totality is only about 100 miles wide during a solar eclipse when you are right in the moon's shadow and it only lasts for a few minutes because the moon is moving so fast, but a total lunar eclipse always lasts about one hour because the earth's shadow or wizard's cap is quite wide where the moon passes through it about a quarter million miles away from us in space.

The deeper red and orange shades on the moon are actually the sunlight being curved around the earth by our atmosphere acting as a giant refracting lens, and reflected back to us by the moon. Otherwise, the moon would just go dark while it is deep in our umbral shadow for about an hour. What you are really seeing is the combined effect of all the sunrises and sunsets all around the earth happening simultaneously when you see that color. The exact hue of this color depends on how much particulate matter is in our atmosphere at the time. The less pollution and fewer particles, the lighter the shade of orange or red the eclipse will exhibit.

The opposite is true of a total solar eclipse. You can see a 360-degree twilight all around you as the moon's shadow races over you at about 2,000 miles an hour as it engulfs everything in its path very quickly. When I saw the August 21, 2017 total solar eclipse in Driggs, Idaho with the Grand Teton mountains in Wyoming as a backdrop, and the one on April 8 of 2024 from the specular Height of the Land overlook on the Appalachian Trail in Rangeley Maine, the moon's shadow raced across this entire country in just 90 minutes, much faster than any of our commercial jets, but not faster than some of our military jets. You can stretch a 3-minute eclipse into several hours if you can fly fast enough to stay directly in the shadow of the moon as it races across the earth at about 3 times the speed of sound.

The rest of the highlights for this month are less spectacular but still worth looking for if it is clear. They include Jupiter still being close to its best for the year as a bright evening planet in Gemini, Venus getting higher in our evening sky, a very close conjunction of Saturn and Venus low in our evening sky 40 minutes after sunset on Saturday night, March 7, Jupiter becoming stationary in our sky as it ends its retrograde motion on March 10, Mercury reappearing in our morning sky towards the end of this month, and Comet Wierzchos passing through Eridanus the River into Taurus the Bull. It should be around 8th magnitude, which is 6 times fainter than anything you can see without optical aid, but it should be visible in a good pair of binoculars.

There is an event called Earth Hour every last Saturday in March from 8:30 to 9:30 pm local time. This gives everyone a chance to do something very practical for the earth and to inspire others to be more aware of the man-made problems facing us and our precious little planet floating in the infinite black void of space. The only boundary that matters from space is the thin blue line of our atmosphere that supports all life on earth and separates us from the cold, unforgiving, and deadly space that we are always traveling through at great speeds.

Jupiter still dominates the evening sky, but it is rising and setting a little earlier each night as it is getting farther away from earth and slightly smaller. It will only fade from -2.4 magnitude to -2.2 magnitude this month. Notice that you can see all 4 of its large Galilean moons just with a pair of binoculars.

We will finally lose Saturn in our evening sky about when spring starts on March 20. Notice that the ringed planet will first encounter brilliant Venus in the constellation of Pisces before we lose it for the season before it becomes a morning planet again in May. They will be less than one degree apart. The full moon covers half a degree of the sky. Venus will be very easy to see first. Then look for Saturn just to its left. Saturn is 100 times or 5 magnitudes fainter than Venus, so you may need binoculars to spot dim Saturn so close to brilliant Venus. Then Venus will keep climbing higher into Pisces and then Aries on its way to reaching its best in the evening sky for this year in late spring.

The only visible planet that we can't see this month is still Mars. It is still too close to the sun and it will not show up again until late April in our morning sky.

If you stay up all night around the vernal equinox, you can actually see the entire sky rotate around you. That is the ideal time to try to find all 109 celestial objects in the Messier catalog, developed by Charles Messier in late 1700's. He was a French comet hunter that did discover about 12 comets, but he catalogued other objects that did not move through our sky. These include open and globular star clusters, several kinds of nebulae, and several kinds of galaxies.

That is called the Messier Marathon, and it takes a lot of skill and good timing and perfectly dark and clear skies to actually find all 109 of these for yourself in an amateur telescope. I have attempted it a few times with friends from my astronomy club, but never got past 3 in the morning. In total over the years, I have seen about 70 of these 109 celestial objects and many more that are listed in other catalogues like NGC, the New General Catalogue.

The most practical event by far that happens every March and that everyone can participate in is called EARTH HOUR. It is always the last Saturday in March from 8:30 to 9:30 local time. This year that will happen on Saturday, March 28. This was started in 2007 and now 190 out of the 195 countries on Earth participate in some way. Some cities shut off many of their lights for this hour and there are many other creative ways to do something for the earth and to become more aware of all the man-made problems facing us than just to shut off your lights for an hour. That by itself will not save much energy, but it will give you ideas that you can then turn into ongoing new actions that you will take individually and collectively from that moment onward.

You are all invited to give one hour thinking about what you can do for the earth over the course of this next year. We all have 8765 hours every year, so we can surely afford to give one of those hours to a cause much greater than our limited selves. The earth works tirelessly 24/7/365 to provide us with everything we need not only to survive but to thrive during our lifetimes and we almost never think about what we owe the earth for providing us with oxygen from its plants and a good atmosphere to protect us from deadly cosmic rays to all of the other life-giving and life-sustaining tasks that the earth is always doing for us even if we are not aware of the great riches and potentials that are always all around us.

Use this one hour to reconnect to and help restore the earth to its potential and to inspire others to care more and become better stewards of our one and only precious planet. Unite with others to shine a spotlight on some of our major problems like the loss of nature and climate change and discover new ways that you can individually contribute to solutions instead of unwittingly being part of the problem.

We can all play our part to help change the world for the better by changing some of our bad habits and becoming more aware of and implementing some of the many solutions already staring us in the face. Turn this one hour into millions of future hours that will continue to pay dividends as it improves the quality of life for billions of people on earth that are suffering right now through no fault of their own. We all have the power to do this and so much more as long as we start somewhere and have the right intentions. Help make this the BIGGEST hour for the earth and ultimately for our own higher selves. As several astronauts have remarked from their privileged view from 250 miles up in space, there are no passengers or free rides on our Spaceship Earth, only crew members with important jobs to do to maintain and sustain life and help it reach its greatest potential in all of its forms on our one and only precious planet Earth.
March 2. The moon passes just north of Regulus in Leo this morning.

March 3. Full moon is at 6:38 a.m. EST. A total lunar eclipse starts at 6:04 this morning, just before sunrise at 6:15. The partial phases start earlier, at 4:50 am. This is also called the Crow, Sap, Worm, or Lenten moon.
March 4. Sir Patrick Moore was born on this day in 1923. He was an English astronomer that has written over 70 books and he hosted the longest-running TV series with the same host on BBC, The Sky at Night. He also developed the Caldwell Catalogue, a list of an additional 109 celestial objects that are not in the more famous Messier Catalogue.
March 6. Joseph von Fraunhofer was born in Germany on this day in 1787. He was an optician who invented the spectroscope and the diffraction grating that breaks up light to study the spectra of different celestial objects. He discovered hundreds of dark lines in the spectra of the sun. Carolyn Porco was born on this day in 1953. She was the lead imaging scientist on the highly successful Cassini mission to Saturn. It was her idea to have Cassini take a picture looking back at the earth and moon, similar to Carl Sagans idea for the Pale Blue Dot image of Earth taken on February 14 of 1990 by the Voyager 1 spacecraft 6 billion miles away out beyond Pluto as part of a Family Portrait series of images of all the planets in our solar system. Saturn is much closer to us, just under 1 billion miles away or about an hour and a half at the speed of light.
March 7. John Herschel was born on this day in 1792. His father was William Herschel who discovered the planet Uranus. John named 7 of the moons of Saturn and 4 of the moons of Uranus and invented the blueprint process. Mercury is in inferior conjunction with the sun this morning. Saturn and Venus are less than one degree apart this evening low in the western sky.
March 8. Daylight Saving time starts at 2 am this Sunday morning.
March 10. The moon passes 0.7 degrees south of Antares in Scorpius this morning. Jupiter is stationary in Gemini, ending its westward or retrograde motion.
March 11. Last quarter moon is at 5:39 a.m. EDT. Urbain Joseph Le Verrier was born on this day in 1811. He was a French astronomer who mathematically showed exactly where Neptune would be found. He sent his coordinates to Johan Galle in Berlin who found Neptune that same night on September 24 of 1846 within one degree of where Le Verrier calculated it would be. The Englishman John Couch Adams also helped in the calculations, so this was a 3- person, 3-nation collaboration to discover our last planet 180 years ago. This was a major milestone in astronomy to be able to mathematically predict such an important discovery. As one astronomer said at that time, “He discovered a planet with the point of his pen.” Neptune has only made just over one orbit around the sun since then since it takes Neptune 165 years to complete one orbit while traveling continuously 12,000 mph. By comparison the earth is always orbiting the sun at 67,000 miles per hour, over 5 times faster than our last planet.
March 13. Sir William Herschel discovered the planet Uranus on this day in 1781. He first named it George in honor of the King, but it was soon renamed to Uranus after the Greek Father of the Titans, whose name also means “the heavens”. Percival Lowell was born on this day in 1855. He thought he saw canals on Mars and he founded the Lowell Observatory where Clyde Tombaugh would discover Pluto on February 18 of 1930. Pluto is now only classified as a dwarf planet.
March 14. Albert Einstein was born on this day in 1879. He made 5 or 6 major discoveries that all could have won the Nobel prize in physics. He only got one Nobel for the photoelectric effect, not for special and general relativity. He also discovered the principles that led to the making of lasers which now have millions of practical uses.

March 16. Caroline Herschel was born on this day in 1750. She was the younger sister of William Herschel and they were both accomplished musicians. Caroline also discovered 8 comets.
March 18. New moon is at 9:23 p.m.
March 19. Mercury is stationary, ending its retrograde motion today at 4 pm.
March 20. The moon passes 5 degrees north of Venus. The vernal equinox is at 10:46 am EDT.
March 22. Neptune is in conjunction with the sun this morning.
March 23. The moon passes 5 degrees north of Uranus in Taurus this morning. Pierre-Simon LaPlace was born on this day in 1749. He was the French Isaac Newton and made many discoveries in celestial mechanics.
March 25. Saturn is in conjunction with the sun this morning. First quarter moon is at 3:18 pm.
March 26. Mars is at perihelion or closest to the sun at 128 million miles this morning. It is very far from Earth now at just over 219 million miles and is not even visible for us for another couple of months. Mars can get as close to us as 35 million miles, or over 6 times closer than it is now. That will happen at its next opposition on February 19 of 2027. Nathaniel Bowditch was born on this day in 1773. He was the founder of modern ocean navigation.
March 28. EARTH HOUR is this Saturday night from 8:30 to 9:30 pm local time.
March 29. The moon passes 0.3 degrees north of Regulus in Leo this afternoon.
March 31. Rene Descartes was born on this day in 1596.