

WHAT'S UP IN MARCH

By Bernie Reim

The month of March is named after Martius, the father of Romulus and Remus who founded Rome, the world's first superpower, according to mythology. March used to be the first month of the year on the early Roman calendar and is also named for the planet Mars, who is the god of war. That is fitting for this particular March, since Mars will be the only evening planet visible all month long.

March always marks the beginning of spring for us in the northern hemisphere. This year that will happen at 5:37 A.M. on Saturday morning the 20th. We did not have a particularly long or cold winter, but it is always nice to welcome spring back once more.

There are only two days each year, the vernal and autumnal equinoxes, when the sun will rise due east and set due west and the days will be 12 hours long for everyone on Earth except for the poles. So that will be a nice unifying factor to be aware of globally. What will be even more unifying, although it is created by humans and not nature itself, will be the annual Earth Hour one week later, on March 27 from 8:30 to 9:30 pm local time. Started in 2007 in Sydney, Australia, there are now 180 countries, thousands of cities, and millions of people that participate every year. This is the world's largest grassroots movement and is designed to bring more awareness to climate change and what we can do about it as we reflect and reconnect to each other and nature to protect our planet. The beauty of the night sky will become much more visible over many cities as all the non essential lights will be shut off for that one hour each year. Everyone can participate and shut off their own lights for that hour and go outside to observe if it is clear. You won't save that much on your energy bill, but you will be able to see the magnified effect of everyone working together towards a common goal.

There will be several interesting highlights in our night sky this month for everyone to enjoy. Mars is beyond its best, but it is well placed now as it drifts very close to the Pleiades star cluster in Taurus on the 4th, its closest pass in 15 years. The next time it will be this close will be 2038, and we will most likely have landed humans on Mars by then.

NASA just successfully landed its Perseverance Rover in Jezero Crater on Mars with pinpoint accuracy on a dry lakebed right by a delta that used to flow into that lake 3.8 billion years ago. That will be a very rewarding mission that took great cooperation among hundreds of scientists and engineers lasting many years. It will look for evidence of microbial fossils in the stromatolites in that delta. It will drill into the planet nearly 2 meters and then some of those samples will be picked up and returned to Earth for the first time ever by another spacecraft. Then it will also fly a drone helicopter called Ingenuity through the thin Martian atmosphere, 12 minutes away at the speed of light. The United Arab Emirates (UAE) and China also have missions to Mars, one of which is already orbiting safely.

All the rest of the planetary action takes place in the morning sky, with Mercury, Jupiter, and Saturn forming some nice conjunctions. Only Venus will not be visible at all this month

since it is too close to the sun. It will reappear in the evening sky next month. The brightest asteroid, Vesta, will reach opposition on the 4th and another Comet Atlas will be visible through a telescope. Then you can also see the faint zodiacal light in the evening sky an hour after sunset when the moon will not interfere.

Mercury and Jupiter will be less than a quarter of a degree apart half an hour before sunrise on the 6th. That is almost as close as Saturn and Jupiter got on the last winter solstice. Notice that Jupiter will be 2 magnitudes or just over 6 times brighter than Mercury. Saturn will be just to the right and above the pair and is 10 times fainter than Jupiter. Then keep watching as Mercury gets a little lower and the waning crescent moon drifts near Saturn on the 9th and near Jupiter and Mercury the next morning.

The waxing crescent moon will pass close to the Pleiades on the 18th, and then continue close to the Hyades star cluster in Taurus, and will pass close to Mars the next evening on Friday the 19th, just before spring starts. Then keep watching each clear night as the moon visits the Beehive cluster in Cancer the Crab on the 23rd and 24th.

At 326 miles in diameter, about the size of Arizona, our second largest asteroid, Vesta, will reach opposition in Leo on the 4th. Vesta is our brightest asteroid, a little brighter than Ceres, which is our largest asteroid at 600 miles across, or about the size of Texas. Vesta will reach 5.8 magnitude that night, which makes it visible even without any optical aid from a perfect dark sky site, but you should probably use binoculars to find it. Vesta reflects 4 times as much sunlight as our moon does, but it is 7 times smaller than our moon.

Remember that we visited this asteroid for a year about 10 years ago. The Dawn spacecraft discovered many fascinating things about this large asteroid orbiting between Mars and Jupiter. Vesta is a differentiated protoplanet with an iron-rich core, silicate mantle, and basaltic crust, similar to Earth. Many of our meteorites on Earth come from Vesta. Then Dawn went on to study Ceres, which is an even more incredible place with a briny liquid ocean just below its icy surface. Dawn saw a bright spot in one of its craters which turned out to have organic chemistry and could well contain some kind of life right now. NASA plans to send another mission there soon to collect some samples.

The zodiacal light is best visible only twice each year, in March soon after sunset and in November well before sunrise. I have seen it 3 times and it is very subtle and the moon has to be absent to see it. This elusive glow is created by sunlight reflecting on trillions of tiny dust particles pervading the solar system and concentrating into a torus around the ecliptic plane. These particles are the remnants of eons of dusty comets as much of their mass is driven off by the strong solar wind as they continually orbit the sun. We would see a meteor shower when we pass right through the dusty trail of a particular comet, but now we can see the vast expanse of the combined effect of much more of this dust since the angle of the ecliptic plane with our western horizon is at its steepest now. Look for a ghostly pyramid or cone of light stretching up through Aries and into Taurus. Mars would be right at the apex of this celestial pyramid.

Mar.2. The moon is at perigee, or closest to Earth at 227,063 miles today.

Mar.4. Vesta is at opposition in Leo and Mars will pass near the Pleiades in Taurus.

Mar.5. Last quarter moon is at 8:30 p.m. EST.

Mar.6. Mercury is at greatest western elongation from the sun this morning.

Mar.9. The moon passes near Saturn this morning.

Mar.10. The moon passes near Jupiter and Mercury this morning in Capricorn.

Mar.13. New moon is at 5:21 a.m. EST. On this day in 1781 William Herschel discovered the planet Uranus. He first named it George in honor of King George III. Then he soon renamed it to Uranus, who is the Greek father of the Titans and whose name also means "the heavens".

Mar.14. Albert Einstein was born on this day in 1879. This is also called pi day since the first 3 numbers of this famous ratio are 314. Einstein developed his special theory of relativity in 1905 and his general theory 10 years later. He completely redefined what gravity really is by discovering that gravity is just the curvature or topography of the 4th dimensional space-time continuum that everything in the universe is embedded in. This led to theorizing the existence of black holes, which were just recently proven to exist and we got our first picture of the shadow of one at the center of a galaxy known as M87 in the Virgo cluster 55 million light years away that is 7 billion times the mass of our sun.

Mar. 16. Caroline Herschel was born on this day in 1750. She was the sister of William Herschel and a good astronomer in her own right and she discovered 8 comets. They were both accomplished musicians.

Mar.18. The moon is at apogee at 251,812 miles from Earth today.

Mar.19. The moon passes just 2 degrees south of Mars tonight.

Mar.20. The vernal equinox is at 5:37 a.m. EDT.

Mar.21. First quarter moon is at 10:40 a.m.

Mar.27. International Earth Hour is this Saturday from 8:30 to 9:30 local time.

Mar.28. Full moon is at 2:48 p.m. EDT. This is also known as the sap, worm, crow, or Lenten moon.

Mar.30. The moon is at perigee again today at 223,886 miles from Earth.