WHAT'S UP IN MAY

By Bernie Reim

The month of May is named for the Roman goddess Maia, who was the mother of Mercury and a daughter of Atlas. May Day, also known as Beltane in Gaelic, marks the half-way point of spring, so it is one of our four cross-quarter days along with our four seasons. The other ones are Lammas on August 1, Halloween on October 31, and Ground Hog Day or Candlemas on February 2.

We have had a cool spring so far following an unusually warm winter. This part of the earth will really start to transform itself this month as the tender young green leaves appear once again on our trees, and cherry and apple trees and magnolias along with many kinds of shrubbery will blossom in all of their glory. Many birds are returning from the south and the spring peepers and other frogs are already singing up a storm to add an audible component to the visual beauty of renewal during spring.

The sky above us is also transforming as we lose Orion and most of the Winter Hexagon with only Gemini and Auriga hanging on for another month. All three members of the Summer Triangle, Lyra, Cygnus, and Aquila, will be up in the northeastern sky by 11 pm by the middle of May.

As the days and nights get consistently warmer now, this is a great time to venture outside more often and enjoy some of the many celestial and terrestrial highlights being offered during this season. Venus is still catching up with Mars in Gemini as the evening planets, and Jupiter, Saturn, and Mercury are the morning planets this month. There will be a penumbral lunar eclipse during the full moon this month on the 5th, but that will not be visible in the U.S. The Eta Aquarid meteor shower peaks on Saturday morning the 6th, but the moon will be very close to full to wash out most of these meteors. The most exciting highlight this month will be an occultation of Jupiter by the moon, but you will need a telescope to see it since it will happen at 7:45 am, which is well after sunrise.

Watch brilliant Venus slowly catch up with Mars all month long. They are both in their direct or eastward motion through the sky now against the fixed background of stars. Notice that Venus is just over 100 times as bright as the Red Planet, which is slowly getting dimmer and falling farther behind the earth's orbit around the sun even as the faster moving Venus is catching up with us and getting brighter. By the end of May, Mars will be just one degree shy of the Beehive open star cluster in Cancer, which is similar to the Pleiades in Taurus, where Mars was a few months ago. Venus will be just 11 degrees to the west of Mars near Castor and Pollux in Gemini. Watch the waxing crescent moon pass near Venus and then Mars on the 23rd and 24th. Venus reaches it maximum northern declination of 26 degrees this month and its highest point above the ecliptic.

Saturn rises at 3:30 am at the beginning of May and two hours earlier by the end of this month. The ringed planet has moved into Aquarius now after spending the last couple of years in Capricorn. Since it takes 29 years to orbit the sun, it spends just over two years in each zodiac constellation.

Jupiter rises about an hour later in Aries the Ram. Both Jupiter and Saturn are also in direct or prograde motion now. Jupiter ended its last retrograde on Valentine's Day of this year. Jupiter only takes 12 years to orbit once, so it spends one year in each of the 12 zodiac constellations. The King of the Planets also undergoes its retrograde loop for 4 months out of each year. If you

have access to a telescope (many libraries have 4.5 inch reflecting telescopes that you can check out like a book) you can see Jupiter being occulted or covered up by a thin waning crescent moon at 7:45 am on the morning of Wednesday, May 17. Both the moon and Jupiter will rise around 4:30 that morning and continue to get closer after that. The moon will pass right in front of Jupiter at 7:45 am for about an hour. That is two and a half hours after sunrise, so it will be too bright to see the planet without a telescope. I have seen several nice daytime occultations of the moon by Venus, but I needed a telescope to see them.

Mercury is slowly moving into our morning sky this month, but it won't be visible until the last week of May. On May 23rd, it will be just 7 degrees due east of the much brighter Jupiter in the eastern morning sky about an hour before sunrise. Our first planet will reach its greatest western elongation from the sun at 25 degrees on May 29.

We are in an eclipse season again, which happens twice every year. Since the moon orbits the earth up to 5 degrees above the plane and down to 5 degrees below this plane, we don't get a nice eclipse twice every month. They only line up twice a year, and even then it will not always be a total solar or lunar eclipse. This time it will be a deep penumbral lunar eclipse at full moon on May 5, so it will not even be a partial since the moon will not enter any part of our deeper and darker umbral shadow.

The moon also has an umbral and a penumbral shadow. You have to be right in a very narrow path on the earth in the umbral or deeper shadow of the moon to see the total solar eclipse. The next one here in the U.S. is less than one year away, April 8 of 2024. That one will start on Mexico, go from Texas to Maine in the U.S., and end over Newfoundland. I will write much more about this great natural event in the coming months. It is not too early to start planning exactly where you want to be to experience this memorable event and record it also.

The penumbral lunar eclipse at full moon this month is only visible over Africa, Asia, Australia, and New Zealand. It would be hard to even notice it unless had binoculars or a good camera lens since the lighter penumbral shadow of the earth. I remember seeing a penumbral eclipse here in southern Maine about 5 years ago that was faintly discernible and looked good through binoculars.

We just had a very rare hybrid solar eclipse over Australia and Indonesia just over a week ago on April 20 at the last new moon. That is part total and part annular. I watched a live feed of it put on by MIT and the Perth Observatory in Western Australia, a few hundred miles south of Exmouth at the very western tip of Australia, which was the only place over land that this eclipse was total. It only lasted 58 seconds, shorter even than the two and a half minutes that I experienced during the Great American Total Solar eclipse on August 21 of 2017. It was still extremely beautiful since there were 10 or 12 huge solar prominences that were clearly visible above the photosphere and chromosphere of the sun.

Then Bailey's beads which look like a string of luminous pearls unfolded much slower than usual as the last rays of sunlight were channeled through the valleys between the mountains of the moon, culminating in a blindingly brilliant flash called the diamond ring. Then the tenuous and ephemeral corona blossomed to life for a mere 58 seconds before the normal brilliant sun returned once more as if nothing unusual had happened. Even the seasoned eclipse veterans that commentated during this whole 3-hour event said they had never seen anything like this before in all of their previous total solar eclipses. Every eclipse is always unique even though some elements of it will be similar. They also gave a lot of good tips on what to look for during

an eclipse and how to photograph it and when the next ones will be happening. There will also be an annular solar eclipse over the U.S. on October 14 of this year, when we enter our next eclipse season.

The last highlight for this month will be the Eta Aquarid meteor shower which peaks on Saturday morning the 6th. It is caused by that most famous of all comets, Halley's. This comet also causes our October 21 Orionids as we pass through the tail of this comet twice each year.

You can normally expect up to 50 meteors per hour from a dark sky site, but the full moon occurs the day before, so it will wash out over 90% of the meteors, leaving only the most brilliant ones to become visible. It will still be worth trying to catch some of them if it is clear. They last for several weeks, so you could also look for them before and after their peak. This comet dust is about the size of a grain of sand and even less dense. So just as the comet itself can become very impressive and easily visible by sprouting a huge coma around it the size of the earth (the nucleus of the comet is less than 10 miles in diameter), and a tail stretching up to 100 million miles through space, these tiny individual pieces of this famous comet are also very impressive as they crash into our atmosphere right at the limit of space, which is about 60 miles high. That is about the distance from Portland to Augusta, but straight up.

These brilliant streaks of light are created by their great speed of 40 miles per second as they get ionized as they start encountering some more air molecules at that height, similar to the 5,000 degree temperatures that a space capsule like Orion endured upon reentry.

May 5. Full moon is at 1:34 p.m. EDT. This is also called the Milk, Flower, or Planting Moon. On this day in 1961 Alan Shepard made the first suborbital flight on the Mercury Freedom 7 spacecraft. Yuri Gagarin completed one orbit of Earth just before that on April 12 of 1961.

May 6. The Eta Aquarid Meteor Shower peaks this morning.

May 10. Cecilia Payne-Gaposchkin was born on this day in 1900. She was one of the famous group of women astronomers called the Harvard Computers that developed the spectral classification system for stars along with many other amazing discoveries.

May 11. The fifth and final servicing mission to the Hubble Space Telescope took place on this day in 2009. The last shuttle, STS-135, would be launched just two years later on July 8 of 2011.

May 12. The Adler Planetarium in Chicago became the first planetarium in the Western hemisphere on this day in 1930.

May 13. The moon passes near Saturn this morning.

May 14. On this day in 1973 our first orbiting space station, Skylab was launched into orbit. It only lasted until July 11 of 1979 and it was only occupied by 3 crews for a total of 171 days. By contrast, the ISS was launched in November of 1998 and has been continuously occupied since November of 2000, nearly 23 years.

May 15. Williamina Flemming was born on this day in 1857. She was another important member of the Harvard Computers.

May 17. The moon passes near Jupiter this morning. Jupiter will be occulted by the moon at 7:45 this morning, two and a half hours after sunrise. The moon also passes just north of Mercury this morning.

May 19. New moon is at 11:53 a.m.

May 27. First quarter moon is at 11:22 a.m.

May 28. Frank Drake was born on this day in 1930.

May 30. Mars is at aphelion or farthest from the sun today 155 million miles.