WHAT'S UP IN AUGUST

By Bernie Reim

The first of August always marks the midway point of summer for us in the northern hemisphere. The word derives its meaning from the Latin word "augere" which means to increase. Augustus was a title given to the Roman Emperor and it means esteemed, venerable, or worthy of respect.

We will have many chances this month to practice respect for the sky and the earth as the nights are slowly getting shorter again and the temperatures remain hotter than normal. The highlights this month include the most famous of all meteor showers, the Perseids on the 12th, and a couple of evening planets low in our western sky, Venus, and Mercury. Then Saturn rises a little earlier each day, starting this month out by rising around 10 pm and rising at 8 pm by the end of the month. The biggest asteroid, Ceres, will be at its best in Sagittarius at 8th magnitude and Comet 13P/Olbers will reach 8th or 9th magnitude in the Ursa Major this month. The best planetary conjunction this month will be Mars and Jupiter being only one third of a degree apart in Taurus one hour before sunrise on August 14, just 2 days after the Perseids peak. Then there are always some nice lunar conjunctions to look for and photograph. A potential great highlight anytime between now and the beginning of autumn or even sometime before the end of this year is the recurrent nova T Corona Borealis that I wrote about last month.

Venus is slowly climbing a little higher each night as it is catching up with us in its faster orbit around the sun. It is nearly fully illuminated by the sun now, but not very bright since it is small and farther from the earth than usual. Look for it very low in the western sky in Leo half an hour after sunset. Keep watching as a thin waxing crescent moon joins it on Monday evening the 5th. Look for Mercury just under 10 degrees below and to the left of Venus.

Mercury will disappear by the middle of the month as it goes through inferior conjunction with the sun on the 18th. Our first planet will reappear low in the morning sky about an hour before sunrise on the last day of this month. Mercury is now about 100 times fainter than Venus.

Then there will be a short gap in the planetary action in the evening sky before Saturn rises in the eastern part of Aquarius near Pisces at 10 pm. Its rings are nearly edge-on now, tilted at only 3 degrees, so it will not look that spectacular in a telescope, but it is still a great and unbelievable sight, especially if you have never seen it before. It is about the same brightness as Mercury, which is 100 times fainter than Venus. Saturn will reach opposition when it rises at sunset and remains in our sky all night long next month on September 8.

Then Mars rises next around 2 am in Taurus close to its brightest star, named Aldebaran. This is an orange giant star located 65 light years away. That means the light you are seeing from that star tonight left there in 1959, about the time our first satellite was launched and we started the space race with Russia. Aldebaran is only one tenth of a magnitude fainter than Mars and about the same orange color. Mars is still far ahead of us in our orbits but we are slowly catching up with it. That will happen in January of next year when Mars will reach opposition. Taurus will still look like it has two bright orange eyes, Aldebaran and Mars for all of this month and right into fall. Notice that Mars is only 5 degrees to the left of Aldebaran.

Then Jupiter rises about the same time in Taurus just to the left of Aldebaran and it appears 16 times brighter than Mars. We are also catching up with Jupiter in our orbits around the sun. That will happen on December 6 of this year, about 3 months after the Saturn opposition.

Jupiter will begin its westward or retrograde motion on October 9th of this year after it traveled into Gemini. Notice the waning crescent moon just 5 degrees north of Jupiter and Mars on the 27th.

You can see Ceres now traveling through Sagittarius at 8th magnitude in a good pair of binoculars. That is our largest asteroid at 600 miles across, or about the size of Texas. Ceres is now also officially a dwarf planet and it was the first asteroid to be discovered on January 1 of 1801. The Dawn spacecraft visited Ceres and Vesta in 2015.

Comet 13P/Olbers is now departing our skies as it is traveling through the Big Dipper into Coma Berenices. It is only about 9th magnitude so you will need a telescope or very good pair of binoculars to see it.

The last remaining highlight is the most famous of all meteor showers, the Perseids. It should be a good year for the Perseids since the first quarter moon sets around midnight that night which gives you the rest of the night to enjoy this great shower. Meteor showers are usually better after midnight anyway because that is when the earth turns into the shower instead of away from it. That is similar to the snowflakes on your windshield during a snowstorm. You would be looking out the back window before midnight and you would look at the front window driving right into the snow after midnight.

Caused by Comet 109P/Swift-Tuttle, you can expect up to 100 meteors per hour this year from a good dark-sky site. The shower actually starts on July 17 and lasts right through August 24, but it will peak on the Sunday the 11th and Monday the 12th. This comet has a fairly long orbital period of 133 years. It was last close to the sun and earth in 1992 and it will not return for 100 more years, in 2125. There were several years of really outstanding Perseid Meteors around the time of this comet's last return. Comet Swift-Tuttle is in the constellation of Hydra the Sea Snake now and you would need a good telescope to see it. The radiant is in Perseus, which rises in the northeast around 10 pm. Look about 30 to 40 degrees away from the radiant to catch most of the meteors, but they will be visible anywhere in the sky although you can trace each one back to this radiant in Perseus.

Then the last remaining highlight could be the best one, the sudden explosion of the "Blaze Star", T Corona Borealis. This is the brightest recurrent nova in our sky and it flares up about every 80 years. It is located 3,000 light years away just to the left and below the second star in Corona Borealis, a semicircle of stars that looks like an upside down crown. It could get as bright as Jupiter or Mars, but most likely it will get about as bright as Polaris, which is a second magnitude star, the 48th brightest star in our sky.

Aug. 1. Maria Mitchell was born on this day in 1818. She was the first professional American woman astronomer and she discovered a comet in 1847. She was also a naturalist and educator and has many other accomplishments.

Aug.3. The Messenger Space craft was launched to Mercury on this day in 2004. This was only the second mission ever to Mercury. The third one is en route now and will get there next year. It is called BepiColombo. Mercury is very difficult to get to because it is so close to the sun's strong gravitational fields. We have never landed anything on its surface. It takes 7 years and very complicated mathematics to get to Mercury. It only takes 7 years to get all the way to Saturn which is nearly one billion miles away while Mercury is only about 60 million miles away, or about 15 times closer than Saturn.

Aug.4. Mercury is stationary in the sky, about to begin its retrograde or westward motion. New moon is at 7:13 a.m. EDT. Venus passes 1.1 degrees north of Regulus in Leo this evening. The Phoenix mission was launched to Mars on this day in 2007. It landed near the Martian North pole and dug about a foot into the Martian regolith. I talked to one of the lead scientists on this mission after she gave a talk at the New England Fall Astronomy Festival at UNH in New Hampshire and she said they actually found some signs of life, but NASA never made this official for some reason.
Aug.5. Mars passes 5 degrees north of Aldebaran this morning. The moon passes 1.7 degrees north of Venus and 7 degrees north of Mercury this evening. Neil Armstrong was born on this day in 1930. He was the first human to walk on the moon on July 20 of 1969. His famous quote "One small step for man, one giant leap for mankind" is still true today and can lead us on to many far more amazing discoveries than just walking on the moon.
Aug.6. The Curiosity Rover was launched to Mars on this day in 2012.
Aug. 8. The moon is at apogee or farthest from Earth today at 251,800 miles. Roger Penrose was born on this day in 1931. He is a British mathematician and astronomer who won the Nobel Prize in physics in 2020 along with Reinhard Genzel and Andrea Ghez. Mr. Penrose mathematically proved that black holes are an inevitable consequence of Einstein's General Theory of Relativity.
Aug.12. Erwin Schrödinger was born on this day in 1887. This Austrian physicist was a key contributor to the revolution in our understanding of quantum mechanics. He devised the famous thought experiment "Schrödinger's Cat" that illustrates the paradox of quantum superposition. The Perseid meteor shower peaks. It should be favorable this year with up to 100 meteors per hour possible from a dark sky site after the moon sets around midnight. First quarter moon is at 11:19 a.m.
Aug.13. George Gabriel Stokes was born on this day in 1819. He was an Irish physicist known for his work in fluid dynamics. He worked with the French physicist Claude-Louis Navier to develop the extremely difficult Navier-Stokes partial differential equations for accurately describing the flow of fluids. Air is only 800 times less dense than water, so these equations also apply to air flow. This is useful in weather predictions and also for accurate climate change models. Proving certain aspects of these critically important equations are one of only 7 remaining mathematical puzzles and conjectures that qualify for the million dollar millennial prize in mathematics. A few others include the Riemann Hypotheses and the P vs. NP problem. Solving any of these remaining great puzzles and mysteries in mathematics would greatly deepen our understanding of the world and benefit all of us in many ways.
Aug.14. The moon passes less than one tenth of a degree south of Antares in Scorpius at 1 am. Antares is an orange super giant star similar in size and distance to Betelgeuse in Orion and is about 700 times larger than our sun. The moon passes 0.3 degrees north of Jupiter this morning.
Aug.19. Full moon is at 2:26 p.m. EDT. This is also known as the Blueberry, Green Corn, or Sturgeon Moon. John Flamsteed was born on this day in 1646. He mapped and developed a catalog of 3000 stars and predicted 2 total solar eclipses among many other achievements. He was the first British Astronomer Royal, a post later held by Edmund Halley in 1720. Martin Rees is the current astronomer royal.
Aug.20. The moon passes half a degree north of Saturn around midnight tonight.

Aug.21. The moon is a perigee or closest to Earth today at 223,815 miles. This is the seventh anniversary of the Great American Total Solar Eclipse on August 21 of 2017. I saw this amazing event in Driggs, Idaho on a high plateau with a partial view of the Grand Teton Mountains.
Aug. 25. On this day in 2003 the Spitzer Infrared Space Telescope was launched as part of the great family of 4 space telescopes to study the heavens in different wavelengths. It stopped working in January of 2020.
Aug.26. Last quarter moon is at 5:26 a.m. Edward Witten was born on this day in 1951. He was the physicist who invented and worked on superstring theory.
Aug. 27. The moon passes 6 degrees north of Jupiter and 5 degrees north of Mars this morning in Taurus. Mercury is stationary again ending its retrograde motion.