

WHAT'S UP IN JUNE

By Bernie Reim

The month of June is named after the Roman goddess Juno, the goddess of marriage and childbirth and the wife of Jupiter, the king of the gods.

June always marks the beginning of summer for us in the northern hemisphere. This year that will happen Friday, June 20 at 10:42 p.m. EDT. That is the highest point that the sun will reach for the year. That will be about 68 degrees high in our sky at high noon, when the sun is on the meridian, a great circle which connects the pole stars. By contrast, it is only 24 degrees high in our sky on the winter solstice on December 21.

Try to get out under the warmer and hopefully drier skies this month to enjoy and appreciate the many celestial events always taking place above us and to attain a larger cosmic perspective of where we really are in space and how we and everything else is always changing and in constant motion from the subatomic scale right up to every single celestial object in the entire universe.

Several interesting highlights this month will include a close conjunction of Mercury and Jupiter low in the western evening sky during the first week this month before we lose Jupiter, good views of Mars in the evening sky, and Venus and Saturn in the morning sky. A bright asteroid named Vesta will be visible in Virgo all month long with just a pair of binoculars and there will be a comet named 29P/Schwassman-Wachmann visible with a telescope moving east through Leo all this month at about 11th magnitude, or about 100 times fainter than any object visible without any optical aid. The slender waning crescent moon will pass just above Venus near the Pleiades open star cluster in Taurus one hour before sunrise on the morning of Sunday, June 22. To top off for this month that will be a minor meteor shower called the Bootids which will peak on Friday, June 27, one week after summer starts.

This will be your last chance to catch Jupiter as an evening planet for this year. Look for the king of the planets just below and to the left of Mercury very low in the evening sky in Gemini half an hour after sunset until June 8. Notice that Jupiter is about 7 times brighter than Mercury. Then Jupiter drops out only to reappear in the morning sky in late July. Meanwhile, Mercury continues to climb higher in our evening sky for the rest of this month.

Mars continues to move rapidly eastward at the rate of one constellation per month, or about the same rate as we are orbiting the sun. The net result is that it appears to stay in about the same place in our evening sky and setting along with the constellation it is in at the time. Mars was in Gemini in April, Cancer in May and it will be in Leo all of this month. Look for a waxing crescent moon near Mars on the first of this month and then keep watching the red planet as it encounters Regulus, the brightest star in Leo and the 21st brightest star in the whole sky on June 16. The orange glow of Mars will nicely contrast with bluish-white hue of Regulus.

Regulus is about 80 light years away and has at least 4 component stars. The main star in Regulus is 4 times the mass of our sun and 300 times as bright. Remember that the photons of light that you see when you look at Regulus left that star about when WW 2 ended in September of 1945.

I actually saw Regulus in the daytime at high noon during the August 21, 2017 total solar eclipse that I saw in Driggs, Idaho near Yellowstone and the Grand Tetons. Three or 4 planets also instantly appeared along with a few other stars as I stood deep inside the moon's shadow for a couple of minutes on that memorable Monday nearly 8 years ago.

The next planet to rise will be Saturn at around 2:30 am in Pisces the Fish. Through a telescope you will notice that its rings are now very thin, tilted at only 4 degrees. They had completely disappeared in March, but Saturn was in conjunction with the sun so no one could see it.

There will be a special rare event on the morning of June 16, 2 days after Flag Day. The shadow of its largest moon, Titan, will cross right over the planet at 5 am for several hours. Through a good telescope you can also see the shadow of Enceladus crossing over the face of Saturn this morning. Enceladus has a global liquid ocean under its icy crust, similar to the moon Europa around Jupiter. Plumes of water ice and vapor are constantly erupting from its south pole and forming a giant water vapor ring around Saturn. Complex organic molecules have been detected in these plumes, so there is a good chance there is something living in this ocean nearly a billion miles away.

The second-largest asteroid after Ceres will be visible in Virgo all this month. It will reach 6.1 magnitude and then fade to 6.7 by the end of June, so you will need at least a good pair of binoculars to see it. Vesta is 330 miles across, or about the size of Arizona. Ceres is 600 miles across, or about the size of Texas. The four largest asteroids in the asteroid belt between Mars and Jupiter, Ceres, Vesta, Pallas, and Juno make up half of the mass of the entire asteroid belt of over 1 million asteroids. About 6% of all the meteorites found on Earth come from the asteroid Vesta. Some of these carbonaceous chondrites contain dozens of amino acids and nucleotides which are the building blocks of life.

The last major highlight for this month will be a minor meteor shower which peaks on June 27. This is called the Bootid meteor shower and it will only produce about 3 meteors per hour from a dark sky site. That is just above the background rate of 1 to 2 meteors per hour from anywhere in the sky on any given night without any meteor showers. All of these meteors will originate from the constellation of Bootes the Herdsman near the Big Dipper. A good orientation technique in the sky is following the arc of the Big Dipper to Arcturus, the brightest star in Bootes and then speeding on to Spica, the brightest star in Virgo right below Bootes. These are the slowest-moving of all the meteor showers, hitting our upper atmosphere about 60 miles up at only 11 miles per second. The fastest ones come in at over 40 miles per second.

At least the moon will be close to new, so it will not interfere with any of these sparse meteors. It is always worth looking at the sky for a while even if no great meteor showers are expected as long as it is clear. These particular meteors are created by the earth passing through the debris trail of Comet 7P/Pons-Winnecke. This comet was discovered in 1819 in France and orbits the sun every 6 years and belongs to the Jupiter family of about 800 comets. The most famous of all comets, Halley's, orbits out to Neptune every 76 years. It will return once more in 2062.

June 1. The moon passes 1.4 degrees north of Mars this morning.

June 2. First quarter moon is at 11:41 p.m. EDT.

June 3. On this day in 1948 the 200-inch Hale Telescope at Mt. Palomar was dedicated.

June 4. On this day in the year 2000 the Compton Gamma Ray Observatory re-entered our atmosphere. It was only up there along with the Hubble Space Telescope for 9 years, but it made many amazing discoveries about the high-energy universe including about one enigmatic gamma ray burst per day that originated way outside of our own galaxy.

June 6. The moon passes half a degree south of Spica this morning.

June 8. Mercury passes 2 degrees north of Jupiter this evening.

June 10. The moon passes 0.3 degrees south of Antares this morning.

June 11. Full moon is at 3:44 a.m. EDT. This is also called the Rose or Strawberry moon.

June 13. James Clerk Maxwell was born on this day in 1831. This Scottish physicist and mathematician was known as the father of modern physics for developing the equations to explain and use the electromagnetic fields that Michael Faraday, an English chemist and physicist discovered in 1831. Maxwell developed these equations in 1865 that led to all of the current technology in electrical engineering that enables us to use radio, TV, mobile phones, computers, the internet, and GPS. Einstein build upon Maxwell's equations 50 years later when he developed the general theory of relativity in 1915. Einstein had high praise for Maxwell saying that one scientific epoch ended and a new one began with James Clerk Maxwell.

June 16. On this day in 1963 Valentina Tereshkova became the first woman in space and still holds the only solo spaceflight by a woman. Mars passes less than one degree north of Regulus in Leo at midnight.

June 18. The asteroid Vesta is stationary. On this day in 1983 Sally Ride became the first American woman in space. Last quarter moon is at 3:19 p.m. The moon passes 3 degrees north of Saturn tonight and 2 degrees north of Neptune.

June 20. The summer solstice is at 10:42 p.m.

June 24. Jupiter is in conjunction with the sun.

June 25. New moon is at 6:32 am.

June 27. The Bootid meteor shower peaks. The moon passes 3 degrees south of Mercury tonight.

June 29. George Ellery Hale was born on this day in 1868. He designed and developed the 4 largest telescopes in the world between 1898 and 1938 culminating in the 200 -inch Mt. Palomar which remained as the largest telescope in the world for 45 years after 1948 until 1993 when the twin 400 inch Keck telescopes were built on Mauna Kea in Hawaii. The moon passes 0.2 degrees north of Mars this evening.

June 30. On this day in 1908 an asteroid exploded about 5 miles above Tunguska, Siberia. The impact destroyed about 80 million trees over an area of about 1500 square miles, or the size of Rhode Island. No crater was ever found nor any large pieces of that asteroid. It hit with the force of 20 megatons, or 1000 times the power of the Hiroshima atomic bomb.