WEEKLY STARGAZERS' NEWSLETTER

by Dr. Bob

Volume 6, Issue 23

These are the notes that I use for the weekly radio broadcast on Rome Radio Station WLAQ AM 1410 and FM 96.9. The program airs at 7:50 a.m. each Tuesday morning. The radio station also has a live FaceBook broadcast at the same time: WLAQ-Rome. Send questions to: ryoung@highlands.edu

OBSERVATION PERIOD:
06/14/22 – 06/20/22

FUN FACT of the Week:
The planet with the longest day - the time the planet takes for a single rotation on its axis – is Venus. It has been determined that a day on Venus is 243.02 Earth days. The reason this happens is, Venus orbits the Sun counterclockwise but it spins on its axis clockwise. Venus spins in the opposite direction than it orbits around the Sun.


Full Moon

MOON FOR THE WEEK:
The Moon will be Full today, June 14th. This means that the Moon will rise at sunset and by midnight will cross your meridian.

Today, the Moon is as close to Earth as it is going to be during this portion of its monthly orbit, astronomers call this Perigee. Today the Moon is 357,432 kms (222,098 miles) from the distance . The average distance to the Moon is 384,400 kms (238,855 miles) from the Earth.

The angular measure of the Moon is 33.43 minutes of arc.

June Full Moon: Strawberry Moon. The Algonquin tribes knew this Moon as a time to gather ripening strawberries. It is also known as the Rose Moon and the Hot Moon. The Algonquin people are an Indigenous people of Eastern Canada. They speak the Algonquin language, which is part of the Algonquian language family. Today, Most Algonquins live in Quebec.

HORIZON TO HORIZON PLANET VIEW

The sun rises at 6:28 a.m. (EDT) and sets at 8:54 p.m. (EDT). Again this week, the Sun is above the horizon longer than the previous week by about 4 minutes. Next week we will have the longest day of the year. More about that in our next issue.

The Sun is still in the constellation Taurus the Bull and the Earth is still increasing its distance from the Sun. Currently, the Earth is 1.0155 AUs (94,396,622 miles) away as compared to last week's distance of 1.0148 AUs (94,331,553 miles). This is an astonishing difference of 65,069 miles further away from the Sun than last week. If you have been following this closely, over the past several issues, you might have observed that the rate that the Earth has been increasing distance from the Sun has been slowing down appreciably.

This week, the Sun is 79.0 degrees above the horizon as it crosses the meridian, which is higher than it was last week at 78.4 degrees.
The days are clearly longer and the Sun is getting higher in the sky as the weeks proceed. These changes and the resulting seasons are caused by the tilt of the Earth's axis, 23.5 degrees.

The Planets:

The string of planetary pearls is still visible in the pre-dawn sky. Saturn rises in the East at 12:45 a.m.. Then it is followed by Jupiter at 2:33 a.m. The next planet is Mars, with its two moons, it rises at 2:58 a.m. Venus, the hottest planet, rises at 5:21 a.m. and the last planet to rise is Mercury. Mercury rises in the East at 5:21 a.m. All of the naked-eye planets are up before sunrise, which is at 6:28 a.m. To see the most elusive planet, Mercury, you are going to have to have a low Eastern horizon and no light pollution is that direction. It is worth the effort to go to a location that can give you those conditions, if you want to see Mercury. All of the other planets will be easy to spot if the skies are clear.

MARS ROVER PERSEVERANCE

To get regular and current updates on the progress of NASA's Perseverance rover on Mars, go to the website:
https://www.space.com/news/live/mars-perseverance-rover-update

SATELLITES FOR THE WEEK (ISS PASSES):

Unfortunately, this is another one of those weeks where the International Space Station is not abover the horizon during the 90-minute window before sunrise or after sunset where we can see it. We will keep trying week, by week.

STAR PATTERNS IN THE SKY

Keystone of Hercules

Hercules is a constellation named after Hercules, the Roman mythological hero adapted from the Greek hero Heracles.

Hercules was one of the 48 constellations listed by the 2nd century astronomer Ptolemy, and it remains one of the 88 modern constellations today. It is the fifth largest of the modern constellations.

The most conspicuous features of this constellation is a beautiful quadrangle that is almost always shown in star maps. This quadrangle is an asterism called the “Keystone of Hercules”.

Within the western edge of the quadrangle is the finest globular cluster in the northern hemisphere. This cluster is called the Hercules Cluster or M13. This globular cluster is 21,000 lys away and has a diameter of 125 lys. The Hercules Cluster has about 400,000 solar masses.

M13 was discovered by Edmond Halley in 1714, and was cataloged by Charles Messier on June 1, 1764, into his list of objects not to mistake for comets; Messier's list, including Messier 13, eventually became known as the Messier Catalog.

The Hercules Cluster can easily be seen using a small pair of binoculars. Through binoculars it looks like a cotton ball in the night sky with the center brightest and fading toward its periphery.

Another beautiful globular cluster (M92) is found in Hercules as well. It too has about 400,000 solar masses and is also about 25,000 light years from the Sun.

Both of these globular clusters are directly overhead during the summer months.

SPACE HISTORY OF THE WEEK

June 14 is Flag Day
In the United States, Flag Day is celebrated on June 14. It commemorates the adoption of the flag of the United States, which happened on that day in 1777 by resolution of the Second Continental Congress.
The United States Army also celebrates the Army Birthday on this date; Congress adopted "the American continental army" after reaching a consensus position in the Committee of the Whole on June 14, 1775.

In 1916, President Woodrow Wilson issued a proclamation that officially established June 14 as Flag Day; in August 1949, National Flag Day was established by an Act of Congress.

1963, June 16: First Woman in Space
In 1963 Valentina Tereshkova became the first woman in space on a Russian rocket, the Vostok 6. She remains the only woman to have a solo flight in space.

1983, June 18: STS-7 Challenger launched
Sally Ride became first American woman in Space
(May 26, 1951 – July 23, 2012) was an American physicist and astronaut. Born in Los Angeles, she joined NASA in 1978 and became the first American woman in space in 1983.

She remains the youngest American astronaut to have traveled to space, having done so at the age of 32.

After flying twice on the Orbiter Challenger, she left NASA in 1987.

She worked for two years at Stanford University's Center for International Security and Arms Control, then at the University of California, San Diego as a professor of physics, primarily researching nonlinear optics and Thomson scattering.

She is the only person to serve on both of the committees that investigated the Challenger and Columbia space shuttle disasters.

QUESTION OF THE WEEK
"I have heard that some stars are moving toward us and some are moving away. How do astronomers know that they are moving?" Belinda M.

One of the properties of light is that light is made up of energy waves. Just like sound these energy waves can change if the source of the energy is moving. Imagine you are standing along the side of the road when an ambulance with sirens wailing. I know that you have noticed that as the ambulance approaches you the sound has a higher pitch than it does after it passes you and is going away. You hear the high pitch change to a lower pitch. This property of wave energy is called the Doppler effect.

Light has the same wave energy property. As a light source approaches you, the color of the light will turn slightly more blue (shorter wavelength) and when it is going away from you, it will turn slightly red (slightly longer wavelength). This is called the red shift and blue shift of light as the sources is moving.

Ok, take a star. As the star is moving toward you, the colors of the star will appear more blue than normal and the star moving away from you will appear more red than normal. Astronomers know what the color of the star should be, and they compare it with the apparent color. From that, they are able to determine whether the star of moving toward the observer or away. Astronomers have equipment that is very precise and they can even measure the the wavelength of the light coming from the edge of a star. From that, they can tell in which direction the star is spinning. The side with a blue shift is coming toward you and the side with a red shift is moving away from the observer.

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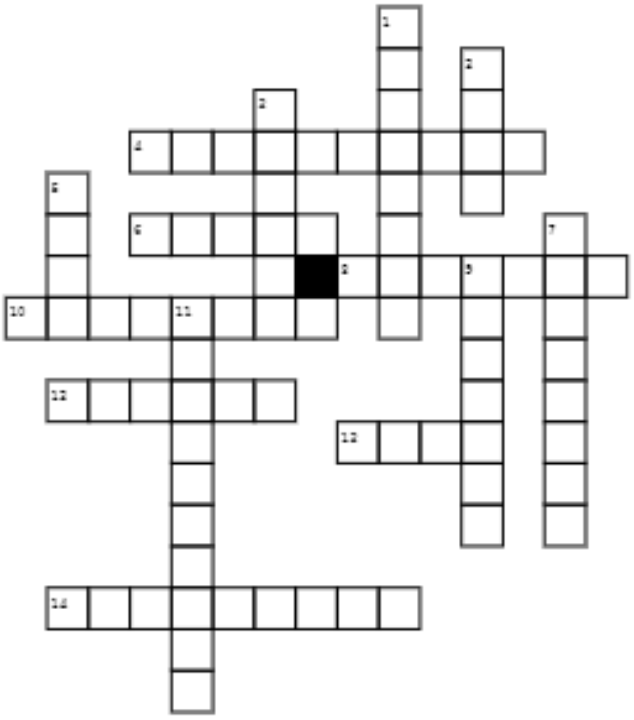

Down:

1. The position of the Earth in it orbit around the Sun on July 4, 2022.
2. The planet in the Solar System with 2 moons.
3. First planet to rise in the east each morning.
5. In 1983, _____ became the first American woman in Space aboard Space Shuttle Challenger.
7. Name of the cluster referred to as M13.
9. The current position of the Moon in its orbit around the Earth.
11. June 16, 1963, _____ became the first woman in space on a Russian rocket, the Vostok 6.

Across:

4. The name given the Full Moon in June.
6. The hottest planet in the Solar System.
8. The effect that happens to the wavelength of sound or light as the source moves toward or away from an observer.
10. Asterism in Hercules where one of the best globular clusters in the northern hemisphere can be seen.
12. The constellation in which the Sun is currently positioned.
13. In 1916, President Woodrow Wilson issued a proclamation that officially established June 14 as _____ Day.
14. The name of the tribe of Indigenous people of Eastern Canada who named the June Full Moon.