WEEKLY STARGAZERS' NEWSLETTER

by Dr. Bob

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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

Etowah GYSTC Website QR code

OBSERVATION PERIOD:
12/06/22 – 12/12/22

FUN FACT OF THE WEEK:

Ganymede, one of the four moons around Jupiter that are called Galilean Moons, has a radius of 1,635 miles (2,631 kilometers) and is the largest moon in our solar system. It's even larger than Mercury and Pluto. If it was orbiting the Sun instead of Jupiter, it undoubtedly would be a planet.

MOON FOR THE WEEK:

The Moon is Full on Wednesday (12/07). December Full Cold Moon. This is the month when the winter cold fastens its grip and the nights become long and dark. This full Moon is also called the Long Nights Moon by some Native American tribes.

The Moon is increasing its distance from the Earth as it heads toward apogee on Sunday, December 11th. The Moon is currently 389,063 kms from the Earth.

To convert kms to miles, multiply kms by 0.62 miles/km.

HORIZON TO HORIZON PLANET VIEW

The sun rises at 7:32 a.m. (EDT) and sets at 5:31 p.m. (EDT). This means that there are 9 hrs. 59 mins of daylight hours compared to 10 hrs. 6 min of daylight hours last week.

The Sun is in the **constellation Ophicuchus.** Ophicuchus is one of the zodiac constellations. Ophiuchus is a large constellation straddling the celestial equator. Its name comes from the Ancient Greek, meaning "serpent-bearer", and it is commonly represented as a man grasping a snake. The serpent is represented by the constellation Serpens. Ophiuchus was one of the 48 constellations listed by the 2nd-century astronomer Ptolemy, and it remains one of the 88 modern constellations. An old alternative name for the constellation was Serpentarius.

The Earth is now 0.985 AUs from the Sun. Last week it was 0.987 AUs from the Sun The Earth reaches perihelion, its closest approach to the Sun, on January 4^{th}.

As a review, one Astronomical Unit is about 93 million miles. Thus, the current distance to the Sun is $1.49X10^{8}$ kms or $0.92\ x10^{8}$ miles.

The Sun will reach an altitude of 33.3 degrees altitude as it crosses the meridian around noon. Last week is was at an altitude of 34.5 degrees.

The Planets:

Mercury rises at 8:49 a.m. This is 70 minutes after sunrise. The planet sets 45 minutes after the Sun. This means that you can begin to see the planet low in western sky after sunset.

Venus rises at 8: 27 a.m. which is about 60 minutes after sunset. Venus is also very low in the western horizon at sunset and you might get a brief glimpse of it before it sets.

Mars rises up in the eastern horizon at 5:29 p.m. and will be up all night long, The Red Planet crosses the meridian at 12:47 a.m., just after mid-night. Look for this planet and it 2 moons.

Jupiter rises in the East at 1:45 p.m. It crosses the **meridian at 7:39 p.m.** This huge planet is very bright and easy to spot with the naked eye. If you have a pair of binoculars, you can see four of the brightest moons: Io, Callisto Ganymede, and Europa. Jupiter is more than 1,000 times larger than the Earth. This huge planet has 79 moons orbiting it in a regular pattern.

Saturn rises at 11:59 a.m. and can be seen dimly at sunset close to the meridian. At 5:13 p.m. Saturn crosses the Meridian and as the skies darken, it will become much easier to spot to the right (west) of Jupiter. The **Ringed Planet** has 82 moons, the most moons of any planet in the solar system.

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)

06 Dec	-3.6	18:54:24	10°	NW	18:57:44	73°	SW	18:59:28	26°	SE	visible
07 Dec	-3.7	18:06:16	10°	NW	18:09:34	56°	NE	18:12:50	10°	ESE	visible
07 Dec	-0.4	19:45:12	10°	WSW	19:45:55	11°	SW	19:46:37	10°	SW	visible
08 Dec	-1.0	18:55:23	10°	W	18:57:54	20°	SW	19:00:24	10°	S	visible
09 Dec	-2.1	18:06:40	10°	WNW	18:09:48	38°	SW	18:12:55	10°	SSE	visible

CELESTIAL FEATURE OF THE WEEK:

Jupiter

We do not generally feature a planet, but we will this week. The reason is, we have a space history topic related to Jupiter AND it is a very easy object to see by the novice observer.

Galileo was the first to see the moons of Jupiter in 1610 with his “opic tube” and also the cloud belts in the clouds around it.

SPACE HISTORY OF THE WEEK

Dec, 7, 1995: Galileo probe enters Jupiter's atmosphere

Galileo was an American unmanned spacecraft that studied the planet Jupiter and its moons, as well as several other Solar System bodies. Named after the astronomer Galileo Galilei, it consisted of an orbiter and entry probe. It was launched on October 18, 1989, carried by Space Shuttle Atlantis, on the STS-34 mission. Galileo arrived at Jupiter on December 7, 1995, after gravitational assist flybys of Venus and Earth, and became the first spacecraft to orbit Jupiter. It launched the first probe into Jupiter, directly measuring its atmosphere. Despite suffering major antenna problems, Galileo achieved the first asteroid flyby, of 951 Gaspra, and discovered the first asteroid moon, Dactyl, around 243 Ida. In 1994, Galileo observed Comet Shoemaker–Levy 9's collision with Jupiter.

Jupiter's atmospheric composition and ammonia clouds were recorded, the clouds possibly created by outflows from the lower depths of the atmosphere. Io's volcanism and plasma interactions with Jupiter's atmosphere were also recorded. The data Galileo collected supported the theory of a liquid ocean under the icy surface of Europa, and there were indications of similar liquid-saltwater layers under the surfaces of Ganymede and Callisto. Ganymede was shown to possess a magnetic field and the spacecraft found new evidence for exospheres around Europa, Ganymede, and Callisto. Galileo also discovered that Jupiter's faint ring system consists of dust from impacts on the four small inner moons. The extent and structure of Jupiter's magnetosphere was also mapped.

On September 21, 2003, after 14 years in space and 8 years in the Jovian system, Galileo's mission was terminated by sending it

into Jupiter's atmosphere at a speed of over 48 kilometers (30 mi) per second, eliminating the possibility of contaminating local moons with terrestrial bacteria.

QUESTION OF THE WEEK:
Do scientist and NASA folks worry about contaminating other planets when they fire rocket into space? Allen M.

Yes, there is a lot of effort in the regard to protecting other planets from our contamination.

Interplanetary contamination refers to biological contamination of a planetary body by a space probe or spacecraft, either deliberate or unintentional.

There are two types of interplanetary contamination:

Forward contamination is the transfer of life and other forms of contamination from Earth to another celestial body.

Back contamination is the introduction of extraterrestrial organisms and other forms of contamination into Earth's biosphere.

It also covers infection of humans and human habitats in space and on other celestial bodies by extraterrestrial organisms, if such habitats exist.

The main focus is on microbial life and on potentially invasive species. Non-biological forms of contamination have also been

considered, including contamination of sensitive deposits (such as lunar polar ice deposits) of scientific interest by rocket exhausts. In the case of back contamination, multicellular life is thought unlikely but has not been ruled out. In the case of forward contamination, contamination by multicellular life (e.g. lichens) is unlikely to occur for robotic missions, but it becomes a consideration in human missions.

Current space missions are governed by the Outer Space Treaty and the COSPAR guidelines for planetary protection.

Forward contamination is prevented primarily by sterilizing the spacecraft.

In the case of **backward contamination**, however, the aim of the mission is to return biological material from foreign planets to Earth if such exists, and sterilization of the samples would make them of much less interest.

So, back contamination would be prevented mainly by containment, and breaking the chain of contact between the foreign planet of origin and Earth. It would also require quarantine procedures for the materials and for anyone who comes into contact with them.