

# 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

## OBSERVATION PERIOD:

06/25/24 – 07/01/24

## FUN FACT OF THE WEEK

Speeding up and slowing down in orbits about a planet works just opposite to what you might expect. The larger a spacecraft's orbit, the longer the spacecraft takes to travel around the Earth. If you wanted to pass a spacecraft just ahead of you, you would have to fire your thrusters **forward** to slow the spacecraft down into a lower orbital energy, where you will ravel faster! The "passing lane" in orbits is always lower.

## MOON FOR THE WEEK:

The Moon will be Third Quarter on Friday, 6/28/24. The Moon will waning during the week as it goes from Full Moon toward Third Quarter and will be seen low in the sky before sunrise in the Eastern predawn sky.



As you watch the Moon day by day, you will see that it moves 12.2 degrees further East, each day as it crosses the celestial sphere.

## Sun in View:

The Sun rises at 06:29 (6:29 a.m.) this week and sets at 20:55 (8:55 p.m.)

This means that the Sun is above the horizon for Sun is "up" for 14 hrs. and 26 minutes.

The Sun climbs to an altitude of 79.1 degrees this week.. The Sun is still in the constellation Taurus, the Bull. Compare this week's altitude to when the Sun rises to only 32.3 degrees on December 21<sup>st</sup>. This week the Earth's range to the Sun is 1.016 AUs. The Earth is still slowly distancing itself from the Sun as we head toward Summer and reach aphelion on July 4<sup>th</sup>.

The Sun is at Summer Solstice on June 20<sup>th</sup>, this is the longest day of the year and the Sun is as high in the sky as it will get all year long, 79.2 degrees above the Southern Horizon as it crosses the meridian.

## PLANETS

**Mercury:** This week Mercury rises in the East at 6:42 a.m. which is about 15 minutes after the Sun. Mercury will be too low to be seen this week.

**Venus** rises in the East at 6:45 a.m. which is also about 15 minutes after the Sun. It too will be too low to see this week.

**Mars** rises in the East at 3:37 a.m. which is more than 3.0 hours before the Sun so Mars is a wonderful object in the predawn sky. Look for its amber hue.

**Jupiter** rises in the East at 5:10 a.m. which is more than an hour before the Sun. Look low on the eastern horizon before sunrise to see this planet.

**Saturn** rises in the East at 1:36 a.m. which is a little more that 5 hours before the Sun. Saturn is an easy target in the predawn sky.

## 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)

<a href="#">20 Jun</a>	-1.5	04:45:18	14°	SSE	04:46:15	15°	SE	04:48:17	10°	E	visible
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<a href="#">21 Jun</a>	-3.8	05:32:15	17°	SW	05:34:44	75°	NW	05:38:04	10°	NE	visible
<a href="#">22 Jun</a>	-3.5	04:46:10	46°	S	04:46:44	54°	SE	04:50:01	10°	NE	visible
<a href="#">23 Jun</a>	-1.7	03:59:59	21°	E	03:59:59	21°	E	04:01:40	10°	ENE	visible
<a href="#">23 Jun</a>	-2.0	05:32:54	11°	W	05:35:31	24°	NW	05:38:20	10°	NNE	visible
<a href="#">24 Jun</a>	-2.9	04:46:38	35°	WNW	04:47:21	40°	NW	04:50:32	10°	NNE	visible

## STAR PATTERNS IN THE SKY

### Summer Solstice June 20<sup>th</sup>

The summer solstice, also known as festival solstice or midsummer, occurs when one of the Earth's poles has its maximum tilt toward the Sun. It happens twice yearly, once in each hemisphere (Northern and Southern). For that hemisphere, the summer solstice is when the Sun reaches its highest position in the sky and is the day with the longest period of daylight. Within the Arctic circle (for the northern hemisphere) or Antarctic circle (for the southern hemisphere), there is continuous daylight around the summer solstice. On the summer solstice, Earth's maximum axial tilt toward the Sun is 23.44°. Likewise, the Sun's declination from the celestial equator is 23.44°.

The summer solstice occurs during the northern hemisphere summer. This is the June solstice in the Northern Hemisphere and the December solstice in the Southern Hemisphere. Depending on the shift of the calendar, the summer solstice occurs sometime between June 20 and June 22 in the Northern Hemisphere and between December 20 and December 23 in the Southern Hemisphere. The same dates in the opposite hemisphere are referred to as the winter solstice.

Since prehistory, the summer solstice has been seen as a significant time of year in many cultures, and has been marked by festivals and rituals. Traditionally, in many temperate regions (especially Europe), the summer solstice is seen as the middle of summer and referred to as "midsummer". Today, however, in some countries and calendars it is seen as the beginning of summer.

## **SPACE HISTORY OF THE WEEK**

**June 21, 2004**

SpaceShipOne launched, first privately-funded human space flight.

The SpaceShipOne is a suborbital air-launched spaceplane that completed the first manned private spaceflight in 2004.

The vehicle first achieved supersonic flight on December 17, 2003, which was also the one-hundredth anniversary of the Wright Brothers' historic first powered flight.

SpaceShipOne's first official spaceflight, known as flight 15P, was piloted by Mike Melvill.

A few days before that flight, the Mojave Air and Space Port was the first commercial spaceport licensed in the United States.

A few hours after that flight, Melvill became the first licensed U.S. commercial astronaut.

The spaceplane was retired shortly after the first flight and now sits in the National Air and Space Museum, in Washington, D.C.

SpaceShipOne takes off from the ground, attached to White Knight, the mother ship, and under White Knight's power. The combination of SpaceShipOne and White Knight can take off, land, and fly under jet power to high altitude.

For launch, the combined craft flies to an altitude of around 14 km (8.7 mi), which takes about an hour. SpaceShipOne is then drop-released, and briefly glides unpowered. Rocket ignition may take place immediately, or may be delayed. If the rocket is never lit then SpaceShipOne can glide down to the ground.

The rocket engine is ignited while the spacecraft is gliding. Once under power, it is raised into a 65° climb, which is further steepened in the higher part of the trajectory. The maximum acceleration during ascent was recorded at 1.70G.

By the end of the burn the craft is flying upwards at some multiple of the speed of sound, up to about 900 m/s (3,000 ft/s) and Mach 3.5, and it continues to coast upwards unpowered. If the burn was long enough then it will exceed an altitude of 100 km (62 mi), at which height the atmosphere presents no appreciable resistance, and the craft experiences free fall for a few minutes.

While at apogee the wings are reconfigured into high-drag mode. As the craft falls back it achieves high speeds comparable to those achieved on the way up; when it subsequently reenters the atmosphere it decelerates violently, up to 5.75G. At some altitude between 10 km (6.2 mi) and 20 km (12 mi) it reconfigures into low-drag glider mode, and glides down to a landing in about 20 minutes.

White Knight takes longer to descend, and typically lands a few minutes after SpaceShipOne.