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Observe - Learn – Share

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## Headlines

- Tolkien Would be So Proud: The Lord of the Rings and the Return of the King: Season of the major planets  
Jupiter and Saturn have returned to our evening skies. Some of the best planet viewing of the year is here.
- 80<sup>th</sup> Moon on Jupiter – discovered by an Amateur Astronomer?
- Space Tourism blasts off  
The last month has seen the blossoming of the Space Tourism industry. Virgin Galactic (Richard Branson) and Blue Origin (Jeff Bezos) both have opened the portal to space for the tourist.
- Astronomical League Observing Program Highlights
  - News from the Astronomical League
  - Jupiter Observing Challenge
  - The Moon
  - Observing Journals
- Happy Anniversary  
It is hard to believe, but it has been 50 years since humans walked on a celestial body other than the Earth.
- Constellation of the month - Scorpius
- Big Doings at the Insperity Observatory  
Construction Projects and one telescope still down

## Tolkien Would be So Proud!

Lord of the Rings? Return of the King? Sounds like a foray into Middle Earth, but really, it is a tour de force off-world. Saturn and Jupiter have finally returned to our evening skies. They are big. They are bright. They are not to be missed.

Jupiter appears as a bright star when viewed with just your eyes, but Jupiter and its four Galilean Moons can be seen in a pair of stabilized binoculars (tripod, etc.). They are tiny, but you can see the moons in roughly a straight line passing through Jupiter. In a telescope they are obvious. To understand the choreography of the moons, check out the charts in The Sky and Telescope Magazine or their website:

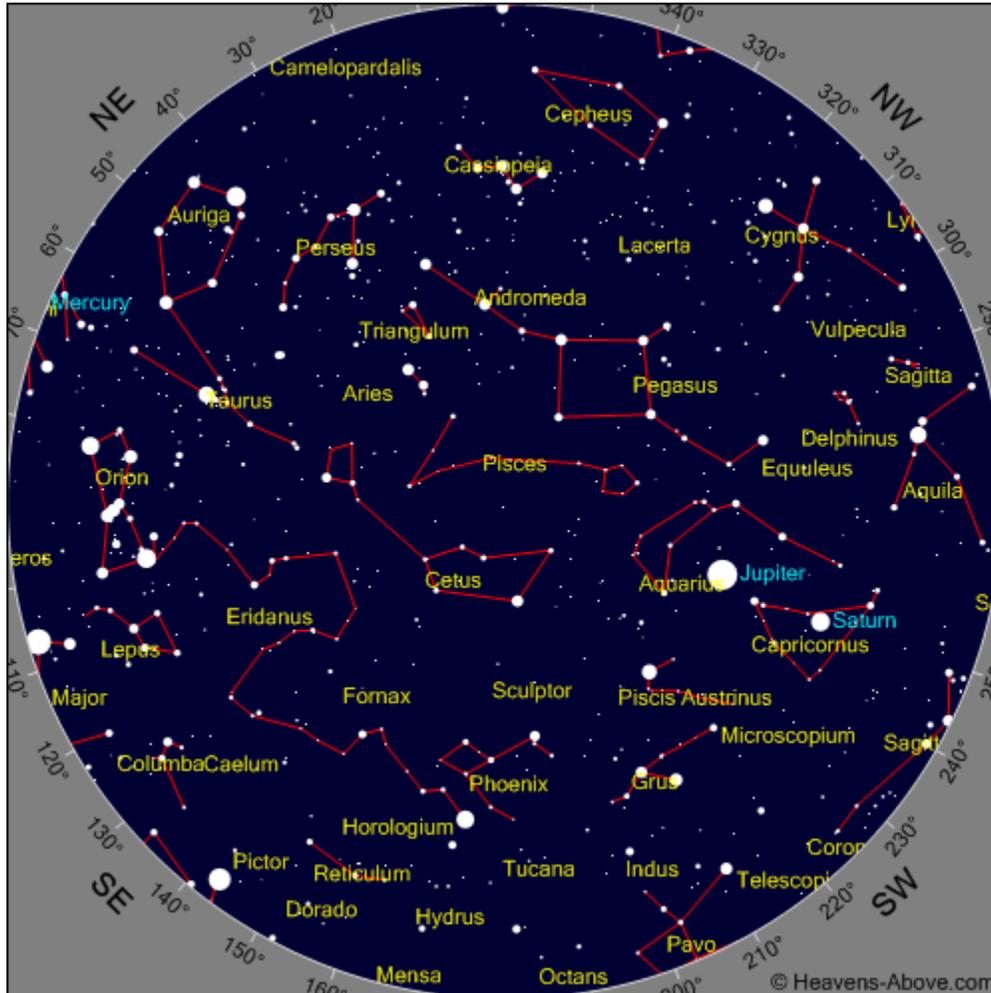
[https://skyandtelescope.org/wp-content/plugins/observing-tools/jupiter\\_moons/jupiter.html](https://skyandtelescope.org/wp-content/plugins/observing-tools/jupiter_moons/jupiter.html)

Saturn appears as a fairly bright yellow star when viewed with just your eyes and changes to a yellow football when viewed in a pair of binoculars. The rings reveal all their glory when viewed in even a modest telescope. You can see seven moons and divisions in the rings themselves.

Jupiter's moons interact with the planet every year. There are Transits (moon crossing in front of the planet), Occultations (moon passing behind the planet), Eclipses (moon passing into Jupiter's shadow), and Shadow Transits (moon's shadow passing across the face of the planet).

This is also the time to view Mutual Events between pairs of Jupiter's Galilean Moons. This only happens twice in each orbit of Jupiter around the Sun (every 6 years), and this is the year! There are two types of events: Eclipses and Occultations.

Saturn is in Capricornus and rises at 9:02 PM and transits at 2:22 AM. Jupiter is in Aquarius and rises at 22:05 and transits at 3:39 AM.



(from Heavens-Above.com)

The best time to view outer planets is when they are at Opposition. The dates for the oppositions of the two giants are:

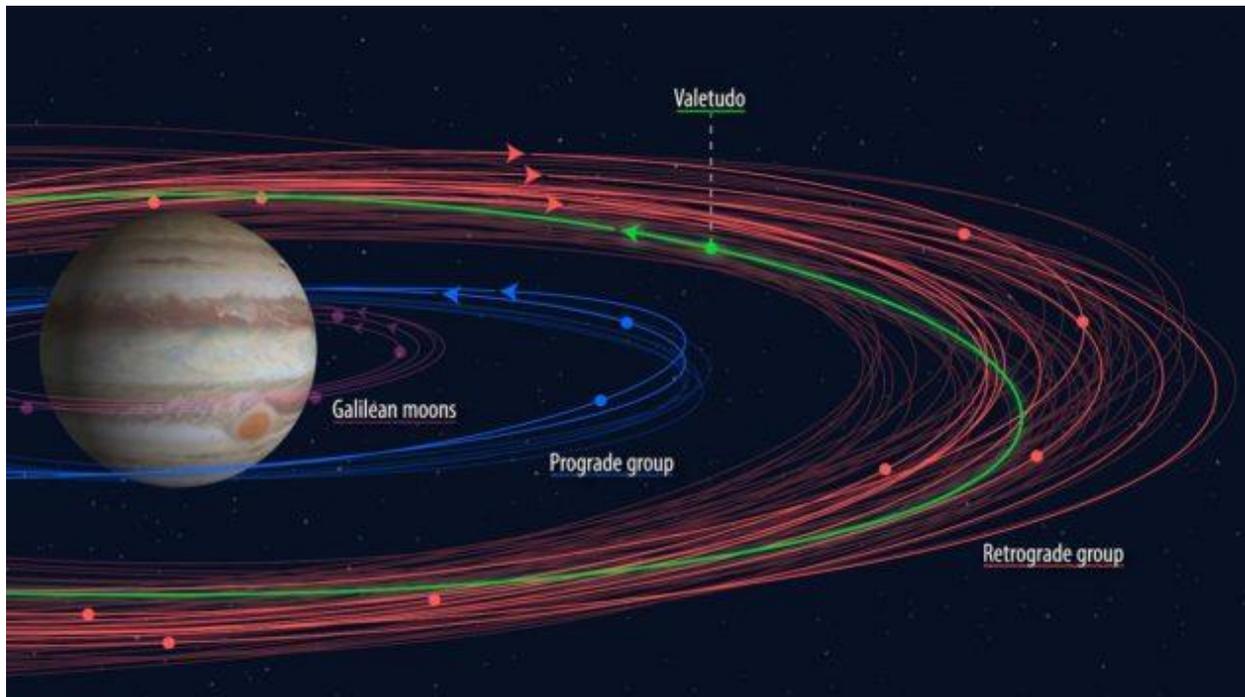
- Saturn – August 2, 2021
- Jupiter – August 19, 2021

## Jupiter's 80<sup>th</sup> Moon?

(from an article at Sky and Telescope Magazine)

Although in today's world it is hard to imagine an amateur astronomer being able to beat the "big boys" in discovering anything in space, it appears that it may still be possible. On June 30, 2021, Kai Ly reported to the IAU's Minor Planet Center a new moon orbiting Jupiter. It is yet to be confirmed and officially designated, but it looks quite optimistic.

This is a sign of the times, and an example of Citizen Science at its best. It is a prograde moon (moving clockwise) but its orbit puts it out among the outer retrograde moons.



Ly was not using his own images through his own telescope but was analyzing images from the 3.6-meter Canada-France-Hawaii Telescope (CFHT). The images are available on-line and are the ones that identified many of the other recent moon discoveries. They were taken in 2003.

## Space Tourism Blasts Off

We are now one step closer to the day when an average Joe (or Jane) can be an astronaut. Well, not yet attainable by most, but we are heading in the right direction.

- A. The first space tourists would be between 2001 and 2009. These were passengers who paid between 20 and 25 million dollars for a ride on a Soyuz spacecraft to the International Space Station. Axion plans to continue this activity beginning in January 2022.
- B. Virgin Galactic launched its first trip from Spaceport America (near Las Cruces, NM) on July 11, 2021.



Spaceport America

Unlike a typical spacecraft which is launched on a rocket, Virgin Galactic's spacecraft resembles an airplane and is take aloft connected to a larger aircraft (Eve). So this makes it tough to think of a launch time. Is it the liftoff from the ground? Or is it the moment of release from the aircraft?



Eve – The Mothership Connection

The aircraft left the ground at about 9:40 CDT. The release from Eve took place about 10:20 CDT.



Return to Earth

SpaceShip Two  
Unity - Go for Space



With touchdown (the landing) at about 10:35 AM CDT.

With only one real tourist aboard, and he being the President of the company that owns the spacecraft, this is not quite tourism, yet. But, quite an accomplishment, and a very real milestone.



#### Flight Details:

- 4 passengers, 2 crew
- 15-minute flight
- Max. Altitude: 55 miles

Price expected to be about \$ 250,000 for a seat.

C. Blue Origin launches first passenger flight on July 20, 2021.



New Shepard rocket on launch pad in West Texas.

The passengers



#### Flight Details:

- 4 passengers
- 11-minute flight
- Max. Altitude: 66 miles

#### Notable Highlights:

- Oldest astronaut: Wally Funk, 82, former NASA astronaut (one of the Mercury 13 - never went to space)
- Youngest astronaut: Oliver Daeman, 18
- Largest windows...

Still a bit pricey for most of us at \$ 25 million.

#### **So where does the atmosphere end and space begin?**

Well, it depends on who you ask. Here are some options for you to consider:

- The limit of the Exosphere: the outermost layer of the Earth's atmosphere. This is around 6,200 miles. So for the purists out there... Only 27 people have been beyond this limit. (3-man crews on Apollos: 8 and 10 through 17.)

- The National Oceanic and Atmospheric Administration (NOAA) says it is 600 miles. This is the point where most experts would agree that you are free of the atmosphere.
- For reference, Hubble Telescope is located at about 340 miles.
- For reference, the International Space Station is located at about 227 miles.
- The Federal Aviation Administration (FAA) says the limit is 82 miles. This is the point where an object can be put into orbit but will quickly decay and return to Earth.
- In 2009, the University of Calgary sent aloft a detector to help answer this question. Their answer? 73 miles (118 kilometers).
- Fédération Aéronautique Internationale (FAI) defines the limit as the Kármán line. This is roughly 62 miles (100 kilometers) up and Blue Origin uses this definition. This is the limit where the National Oceanic and Atmospheric Administration (NOAA) says that a conventional aircraft could not get enough lift to maintain flight.
- NASA, the US Air Force, and Virgin Galactic use 50 miles as the limit. This is somewhat arbitrary but is considered the point where the atmosphere blends into space. And hey, we are talking NASA here.

**Side Note:** The Kármán line is named after Theodore von Kármán (1881–1963), a Hungarian American engineer and physicist. His original calculation was 84 kilometers

## Astronomical League Observing Program Highlights

- A. No new Observing Programs were adopted this year at the Astronomical League's annual Council Meeting in July. This is the first time in a decade when no member of the Astronomical League has submitted a proposal for a new Observing Program. If you have any ideas, check out the list on the AL Website:

<https://www.astroleague.org/al/obsclubs/AlphabeticObservingClubs.html>

There are many to choose from, but they are always looking for new opportunities.

- B. Jupiter. As was discussed in the July Novice meeting (July 23, 2021) this is the year to emphasize Jupiter. Some Astronomical League Observing Programs that might be of interest include:
- a. The AL 75<sup>th</sup> Year Observing Challenge
  - b. Galileo's TOES
  - c. Galileo's TOES II
- C. The Moon. Let's focus on the moon in this newsletter. The Astronomical League has three Lunar-based Observing Programs: Lunar, Lunar II, and Lunar Evolution.
- a. Lunar
  - b. Lunar II
  - c. Lunar Evolution
- D. Observing Journals.

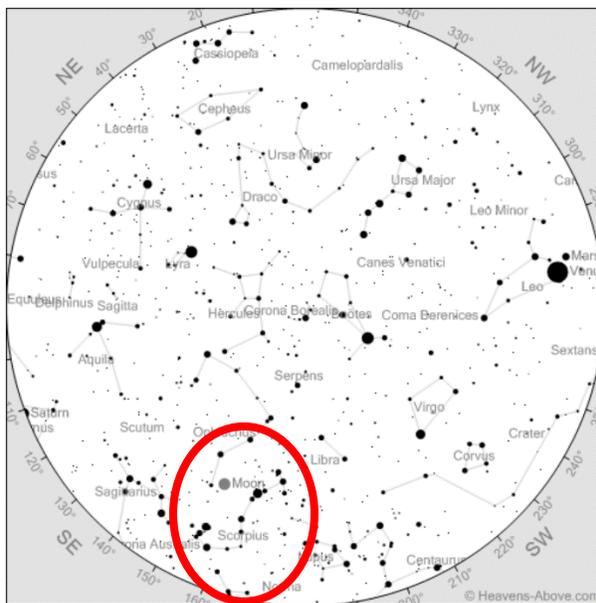
## Happy Anniversary

- July 16, 1969 – Launch of the Apollo 11 spacecraft.
- July 20, 1969 – First Apollo Lunar landing. Man is officially on the Moon.
- July 21, 1969 – Lunar Liftoff.
- July 24, 1969 – Splashdown of Apollo 11.



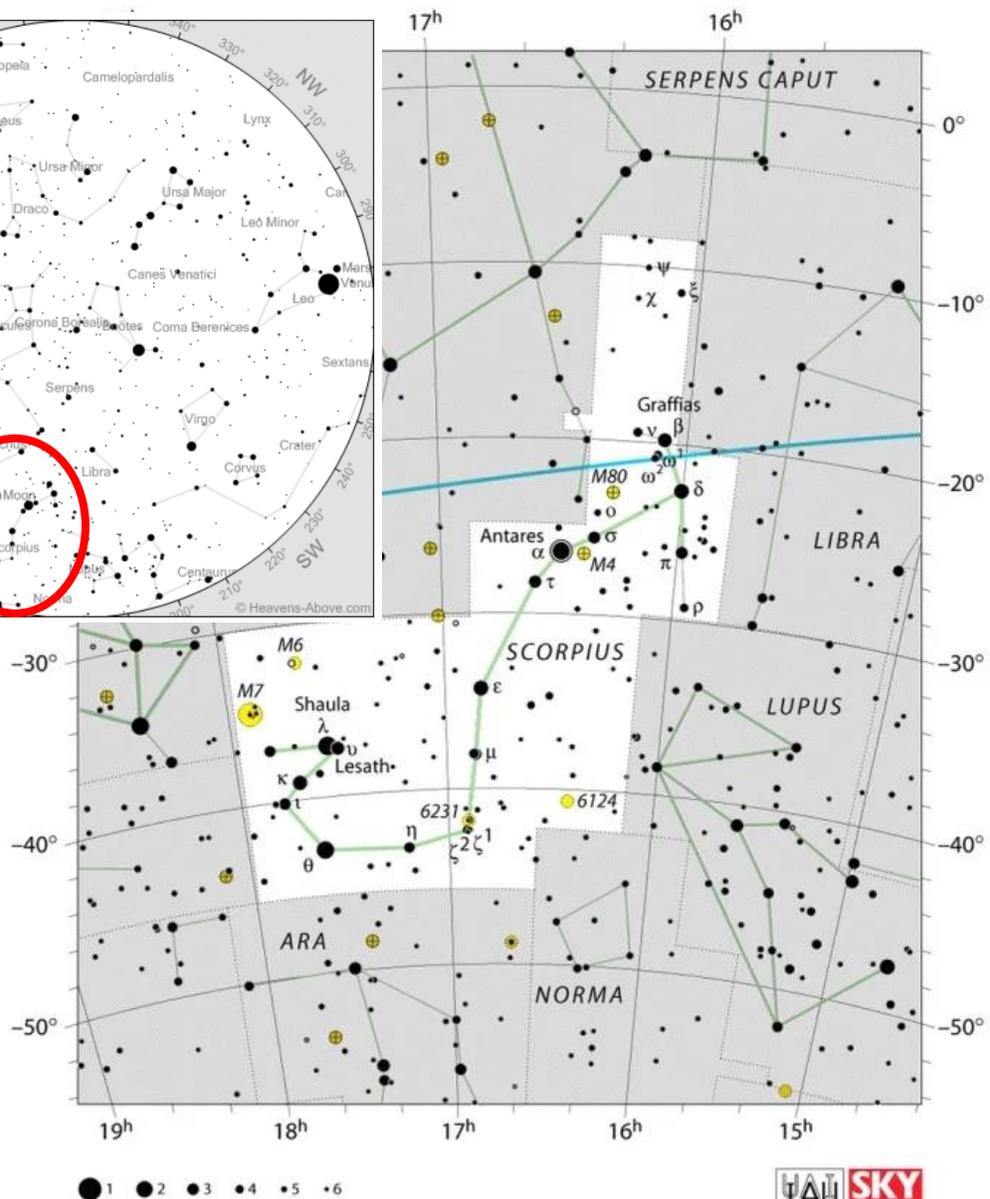
## Constellation of the Month - Scorpius

Looking south this time of year reveals one of the better constellations of the Zodiac (constellations along the ecliptic), Scorpius, the scorpion.



(from Heavens-Above.com)

(from Sky & Telescope)



● 1 ● 2 ● 3 ● 4 ● 5 ● 6

Messier objects M4, M6 (butterfly cluster), M7 (Ptolemy cluster), and M80 are all located within the boundaries of Scorpius. There are also two nice NGC objects in Scorpius as well: NGC 6124 and NGC 6231.

According to Greek and Roman mythology, this is the Scorpion that stung Orion. The Greeks viewed the constellation Libra as the claws of the scorpion.

Scorpius is quite close to the direction of the center of the Milky Way Galaxy. It is located just to the east of the scorpion's stinger at the end of its tail.

## **Insperty Observatory**

The Observatory is open for business! Public Night is the first Friday each month, from sunset to 10 PM. For more information check out the Observatory's website at:

[www.humbleisd.net/observatory](http://www.humbleisd.net/observatory)

Sadly, recent history has shown that the weather is always in charge. We have had sun of cloudy nights...

We would love to have you join us as a member of the public or join us as a volunteer. No experience or knowledge is required to volunteer. Come join us and learn as you go. We will let you do anything that you are comfortable doing. Contact the Observatory Director, Aaron Clevenson, at [aaron@clevenson.org](mailto:aaron@clevenson.org) to volunteer.

The Foundation for the Sun on our 400-foot long Solar System Model has been poured, as has the center telescope pier. The 16-inch telescope is still being repaired.

Progress continues on the design for our Radio Jove radio telescope. It is currently out for construction bids.

## **Contributions Encouraged**

If you are bored by listening to news from the perspective of the editor... If you have a story to share... Or if you hear some astronomy news... we would like to include it here. We will also include images.

Please send contributions to Aaron Clevenson at [aaron@clevenson.org](mailto:aaron@clevenson.org)

## **North Houston Astronomy Club website**

[www.astronomyclub.org](http://www.astronomyclub.org)