

VILLAGES STAR

Newsletter of The Villages Astronomy Club

Volume 4, Number 6

June 2023

Club Website:

<http://vlgastroclub.org/>

Facebook:

<https://www.facebook.com/groups/vlgastroclub/>

Club Officers & Directors

President Mark Graybill

Vice President Ken Katta

Secretary/Historian Burt Salk

Treasurer Linda Meng

Education Coord. Randy Gilbert

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UPCOMING EVENTS

Executive Directors' Meeting, June 2nd, 11am

All members are welcome to join our officers and directors at our monthly meeting to plan future events and activities for the club. We have a number of educational activities that we will be holding for Camp Villages and local summer school programs, as well as advance planning for next fall.

Meetings are at Fishhawk Recreation Center, 2318 Buttonwood Run, from 11a to 12p.

June 6th, 6:30pm: Space Academy

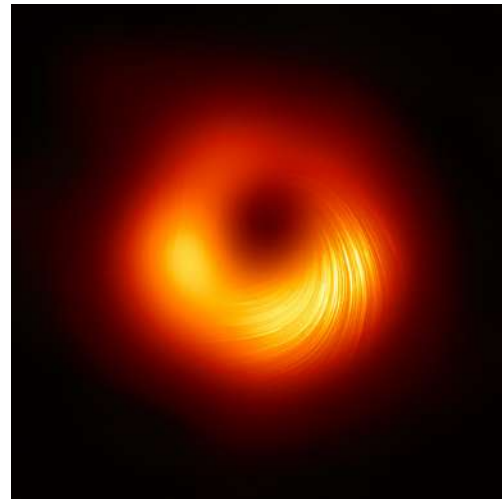
Studebaker Room, Truman Rec Center, 2705 Canal Street.

Space Academy focuses on popular subjects of basic astronomy and astrophysics in an approachable way. This session will be hosted by Toni Graybill, and will include two features, plus discussion on each.

The first will be Bright Objects of the Night

Sky, by Dr Alex Filippenko. It will last about 30 minutes, to be followed by discussion.

Next will be current news on the Supermassive Black Hole at the center of galaxy M87, in a video by Anton Petrov.



Supermassive Black Hole in M87: EHT Polarized Light Image

June 6th, 8pm: Telescope Workshop

Our monthly telescope workshop will be held at Truman Recreation Center, near the pavilions (behind the pool from the parking area.) Address is 2705 Canal St. in The Villages (just north of 466A.)

Bring your questions, your telescopes or binoculars, and share information with other observers on observing instruments and techniques, accessories, locations, and upcoming events. Those who are just interested in getting a look through a telescope are welcome to attend, and if you're up for more astronomy after Space Academy, this may be the perfect way to get it!

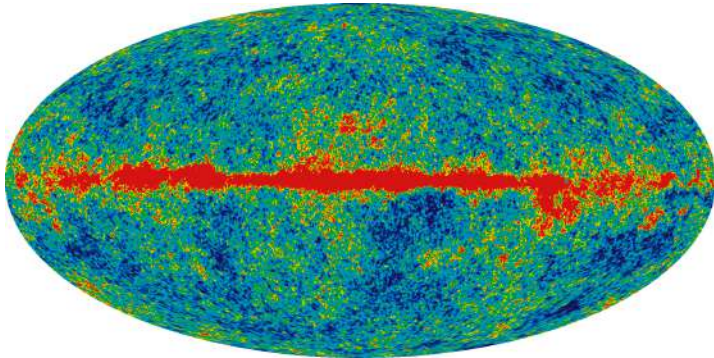
In the event of inclement weather, we will move inside the Truman Rec Center's Studebaker room from 7:30 to 8:20pm.

General Meeting, May 16th, 2023:

Cosmology of the Universe Pt 1, by J.B. Smith

Join us on the 54th anniversary of the Apollo 11 lunar landing to learn about how our universe came into existence and the formation and function of the objects within it. This will be the first part of a presentation that will be continued at a fall meeting this year.

Matter and antimatter, the Big Bang and the Big Crunch. Learn what they are, how they relate to each other, and how matter forms into stars and releases energy into the universe. Member J.B. Smith will share his voluminous knowledge of the universe with us, or at least as much as can be compressed to two meetings' presentations!



Cosmic Microwave Background
WMAP Image by NASA

June 17th, 5pm: Fruitland Park Astronomy

The Fruitland Park Astronomy Club meets for an evening of observing and talk on the third Saturday of the month every month, conditions allowing, at the Cales Soccer Field in Fruitland Park at 300 Shiloh Road (at the corner of Shiloh Road and Dixie Avenue, north of the Fruitland Park water tower.) Village Astronomy Club members and the public are welcome. Bring your telescopes, binoculars, or just your eyes and your interest. Gate opens at 5pm.

Scopes can be set up directly off of tailgates onto pavement, or taken further into the park along paved walks, away from the road to avoid nearby lights. The front of the park has Bortle 5 skies. Power is available.

In the event of foul weather, the club is now

able to use the pavilion at the Gardenia Park Recreation Complex, at 201 W Berckman St, Fruitland Park (across the street from Furniture Barn.) A talk on astronomy or observation will be given, along with instruction or assistance with telescopes.

Calendar: <https://vlgastroclub.org/calendar/>

NEWS

ULA Vulcan Prepares for First Flight



ULA Vulcan Launch Vehicle Being Prepared for Static Fire Test. ULA Image.

United Launch Alliance continues to prepare for the first launch of the new Vulcan rocket this year. The Vulcan has been designed to replace both the Atlas V and Delta IV launch vehicles at a lower price, with the possibility of future component recovery.

A test of the Centaur V upper stage suffered a mishap on March 29th when hydrogen leaked in a structural test stand at Stennis Space Center, causing an explosion that damaged the Centaur's tanks. It has recently been determined that the leak was on the Centaur itself, not on the test stand or its related equipment..

At present, the first launch of Vulcan may still occur in June, with a static fire test as early as May 25th.

For more information on Vulcan, visit:

<https://www.ulalaunch.com/rockets/vulcan-centaur/countdown-to-vulcan>

For information in Astrobotic's Peregrine Lander:
<https://www.astrobotic.com/lunar-delivery/landers/peregrine-lander/>

SpaceX Starship Progress



SpaceX Raptor Engine Fires Into Water Cooled Steel Plate. SpaceX Image.

Since the Starship Integrated Test Flight of April 20th this year, progress on preparing for the next test flight has been a rapid, multi-pronged effort at SpaceX's Texas facilities.

Launch Pad Water Deluge System

Preparation of the ground for the new steel deluge plate under the Orbital Launch Mount has been rapid. Excavation of the site completed only a few days after the launch, which destroyed the concrete pad and its reinforcement. Since then, many concrete pilings have been drilled and poured to support the new deluge plate system. Also, tankage and piping systems for the water to be used in the deluge system have been installed up to the point of where the lines will enter the piping that encompasses the launch pad and where the steel plates will go.

Flight Termination System

Meanwhile, SpaceX has conducted a test of an updated flight termination explosive using one of their structural test articles for Starship's propellant tanks known as "Serial Number 6". The flight termination system failed to cause an immediate breakup of the Starship and booster

during the April test, and this is probably the most critical upgrade required for the next test. Cameras caught the test, which consisted of a short explosion on the side of the tank at the point where it has a bulkhead between the oxidizer and fuel tanks just as on the Starship vehicle. The tanks were loaded with water at operational pressures for the rocket. The test appeared to go well, with the tank completely collapsing immediately.



Starship 25 Moves to the Test Pad for Static Firing. SpaceX Image.

Next Starship Launch Preparations

Starship 25 has been moved to one of the suborbital test pads at the SpaceX launch site ahead of an announced static test firing of its 6 Raptor engines. This appears to signal that Ship 25 will perform the next attempt to reach orbit by Starship. Ship 25 includes a full heat shield and flap recovery system, which Elon Musk has stated are important items to be tested on an orbital flight.

Two other ships, 26 and 27, that were possible contenders for the next test do not include heat shields or flap systems for attitude control during atmospheric re-entry. They are expected to be used in later tests to place payloads in orbit and possibly to transfer propellants in orbit. Also in the lineup are ships 28

and 29, which do include heat shields and flaps, as well as many other design upgrades from the earlier craft. Ship 28 is in the late stages of assembly, while 29 still has more work to be done on it, but it is following ship 28 closely.

Orbital Launch Mount

The primary systems of the OLM, including the “chopsticks” lifting system, all appear to have been tested and functional at this time. Most of the steel cladding that protects elements of the launch tower have been repaired and reinstalled at this time.

The quick disconnects, which provide umbilical connections between the launch pad and the rocket, have been removed for repairs and are expected to be reinstalled within days as SpaceX rapidly reconditions the launch site.

The Next Launch

While much remains to be done, Elon has telegraphed that the next launch could occur as early as mid-June, at least aspirationally. The many systems being installed and repaired are yet to be completed, and will require testing once in place.

Also unknown at this time is the schedule on which changes to the flight termination system will be approved, and the time required for the next launch license to be issued. Overall, a June launch date is not entirely out of the question, but late June or August appear more likely than mid-June based on what can be seen now.

Axiom Space Sends Astronauts to ISS

In their third commercial crewed Dragon mission, SpaceX launched four astronauts to the ISS for Axiom Space on May 21st. SpaceX’s prior commercial crewed launches were Polaris 1 and AX-1. AX-1 was also conducted for Axiom. While SpaceX crew launches for NASA are almost routine now, the business of launching non-space agency astronauts in space is still new.

Axiom has an exclusive agreement with NASA to send their crews to the ISS, as part of a

long-term contract that is expected to culminate in a new commercial space station operated by Axiom. It is expected to replace the ISS as NASA moves even further toward commercial services by contracting for its post-ISS space station.

Currently, NASA has committed to operating the ISS until 2030, but Axiom is expected to produce station modules that will extend the ISS’s capabilities during its continued operation. With time, those modules can be used as the basis of a new commercial space station, potentially employing some of the ISS’s modules that are capable of being saved after ISS decommissioning.



AX-2 Mission Patch. Axiom Space Image.
For more information on Axiom Space, visit:
<https://www.axiomspace.com/>

JWST News

The James Webb Space Telescope continues to make new discoveries almost daily as it gives a view to the universe that is unequalled otherwise.

Among its latest are the discovery of the oldest galaxy yet seen, 12.8 billion years old, combined images taken by JWST and the Chandra X-Ray Observatory to give new views of previously studied objects, and receipt of the AIAA’s Premier Awards for 2023 for its images of

the DART asteroid redirection test, giving critical information about the effects the ejected material had on the movement of the target asteroid.

Read these stories and more at the JWST news page, here:
<https://webb.nasa.gov/content/webbLaunch/news.html>

Supernova Erupts in Pinwheel Galaxy

Amateur supernova hunter Koichi Itagaki discovered a new supernova in Messier 101, the Pinwheel Galaxy, on the night of May 19th. At the time of discovery, it was magnitude 14.9. It has since brightened rapidly, becoming brighter than the entire rest of the galaxy all together.

Now visible in telescopes as small as 3 inches aperture, it has brightened to magnitude 10 and is still gaining brightness.

In the event that you are under dark skies without clouds any time in the next several weeks, be sure to see this very rare event for yourself.

For a finder chart and notes on observation, visit:
<https://skyandtelescope.org/astronomy-news/brigt-supernova-blazes-in-m101-the-pinwheel-galaxy/>

IN THE SKY THIS MONTH

The Moon:

1st Quarter, May 27th
Full Moon, June 3rd
Last Quarter, June 10th
New Moon, June 18th
1st Quarter, June 26th
Full Moon, July 3rd

Venus and **Mars** are our evening planets this month. Mars has become very small and requires high powers (>100x) to see any surface detail.

On June 1st and 2nd, Mars will be in the Beehive Cluster (M44) in Cancer. This view can be enjoyed with binoculars or a telescope at low

powers. The Beehive is a cluster of yellow stars to the west of Leo's backward question mark.

Venus starts the evening high in the sky and is at a near half phase early in the month. In the second week of June, Venus approaches the Beehive Cluster as Mars moves toward Leo. On the 12th Venus will be at its closest, just under a degree away from the Beehive. This is too far away to be seen in the view of most telescopes, but a pair of binoculars will catch the sight if the sky is clear.

Saturn starts the month by rising at 1:30am, but rises a few minutes earlier each night, until it is rising at about 10:30pm at month's end. The rings appear at a low angle, about 8 degrees of tilt, and will continue to close over the next two years until they are edge-on in March 2025. To see the rings requires about 35-40 powers of magnification, so they require a telescope to be seen. Our view of Saturn will improve over the next few months as it gets closer to opposition on August 27th, when it will be at its brightest. Saturn is currently in the constellation Aquarius.

Jupiter rises after Saturn, shortly before 3am at the start of the month, moving to about 1am at month end.

Uranus rises at about 3:30 am, as the earliest glow of dawn appears in the sky. At month's end, it will be rising at about 1:30am.

Neptune rises shortly after Saturn, following it by about 45 minutes time in the sky.

The coming of thunderstorm season means that observing opportunities are few and far between. Clouds will usually block out our evening sky, though occasionally they will break during the night to allow observation for a few hours around midnight, or between late night and dawn. This means that observers must stay abreast of current weather conditions to know when these openings will appear, and be ready to get out with telescope, binoculars, or camera when they appear.

The constellations of late spring and summer are visible in the time around midnight, and these late night openings, alongside the occasional clear evening over the next few months, are the only chance to observe the summer objects so familiar to observers across the rest of the nation.

Sagittarius, Scorpius, Ophiuchus, Serpens

In this area there are many of the brightest and most spectacular objects in the sky for small telescopes and binoculars. While winter gives us the Orion Nebula, in summer skies we have the Lagoon and Trifid Nebulas (M-8, M-20), the Eagle Nebula (M-16), and the Swan Nebula (M-17).

This part of the sky also holds many star clusters, including one of the most beautiful globular clusters, the Arkenstone (M-22), the Scutum Star Cloud (best seen in binoculars), and clusters M-6 and M-7 near the tail of the Scorpion.

Without moving too far around in the sky, one stunning sight after another presents itself to the observer. Though summer observing is difficult in Florida, these are among the rewards waiting for the persistent astronomer!

Telrad finder charts for the Messier objects can be found at the following web page:

<https://sherwood-observatory.org.uk/astronomy/finder-charts/messier-finders>

For more information on sky events this month:

<https://in-the-sky.org/>



Globular Cluster M-22



Image of the Lagoon (M-8) and Trifid (M-20) Nebulas. Image by Giuseppe Donatiello.

The Lagoon is the lower red nebula, the Trifid the upper nebula. These colors do not appear to the eye in most telescopes, but the structure does.

Club Calendar

June

- 2** Exec Meeting 11am Fishhawk Rec Ctr
- 6** Telescope Workshop 8pm at Truman Rec Center, Space Academy 6:30pm
- 17** Fruitland Park Observing 5pm 300 Shiloh Rd
- 18** New Moon
- 20** General Mtg 6:30pm Laurel Manor Rec Ctr.
Cosmology of the Universe by JB Smith

July

- 3** Wildwood Summer Celebration?
- 4** *Workshop and Space Academy Cancelled*
- 7** Exec Meeting
- 15** Fruitland Park Observing
- 18** General Meeting: Round Table Meeting

Club Calendar on the web:

<https://vlgastroclub.org/calendar/>