

VILLAGES STAR

Newsletter of The Villages Astronomy Club

Volume 4, Number 7

July 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

Newsletter Contact

saundby@gmail.com

(please include TVAstro in subject line)

UPCOMING EVENTS

Happy Birthday America!, July 3rd, 4-10pm

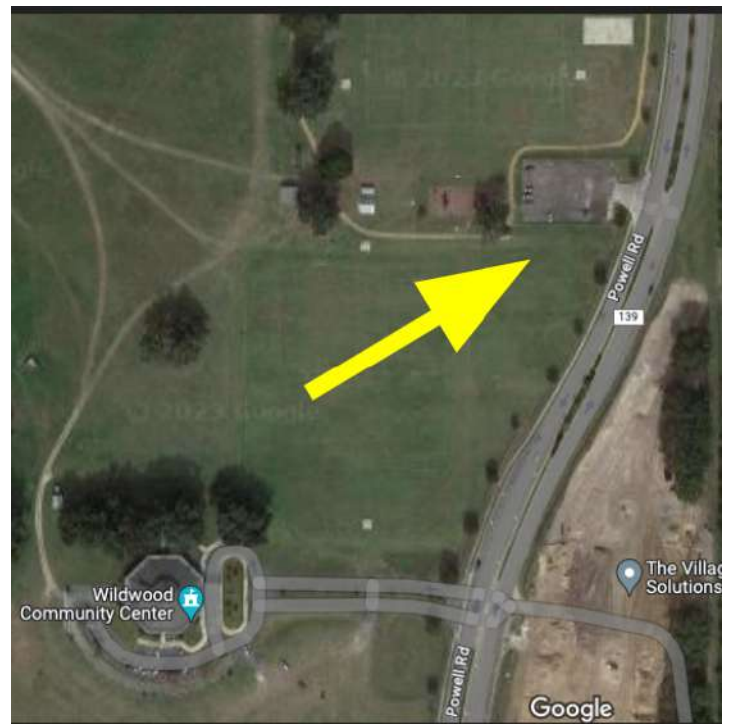
Our astronomers will be showing the sky to the public before and after the fireworks show in Wildwood, at Millenium Park, the location of the Wildwood Community Center at 6500 Powell Road.

We will be setting up our telescopes on the grass between the playground parking lot and the main field (see map). We have requested that a parking area for our astronomers be blocked off for us. Astronomers with equipment should enter the site at the playground entrance north of the main entrance. All others should enter at the main entrance, and park in the general parking area.

The event will include food trucks, a bounce house, live performances on stage, and fireworks at about 9pm. We will be able to show the public the sun with solar scopes until it descends behind the trees, then Venus, Mars, Regulus, and possibly other objects before the

fireworks start. After the fireworks, we should be able to show many other objects in the sky for those not in a hurry to join the traffic jam departing the site.

The event is scheduled from 5pm to 10pm, astronomers should arrive early, at 4pm if possible. We will try to hold parking spaces for any late arrivals.



Astronomers with Telescopes Should Park in Playground Parking Lot (arrow)

Executive Directors' Meeting, July 7th, 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.

July 4th: NO Space Academy or Telescope Workshop!

There will be no Space Academy or Telescope Workshop in July because of the holiday. Please join us on August 1st, when Space Academy will resume at 6:30pm with “New Eye on the Sky”, a documentary on the James Webb Space Telescope, and the Telescope Workshop will begin at 7:30pm.

General Meeting, July 18th, 2023:

Round Table: Your Astronomy Interests

Join us as we get to know each other better and discuss what it is that keeps us interested in astronomy, and what that interest drives us to do! We're also interested in your ideas of how the club can better serve our members, and in describing opportunities our year-round members have to assist the club!

July 15th, 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 Delayed to NET Q4



Payload Fairing for Vulcan First Flight. ULA Image.

The new Vulcan launch vehicle, designed by United Launch Alliance to replace the Delta IV and Atlas V launch vehicles, has successfully completed a test firing of its first stage engines.

This was the first firing of Blue Origin's BE-4 engines as a pair, and while connected to the first stage vehicle. The test marks a significant milestone as Vulcan closes in on its first launch of Astrobotic's Peregrin robotic lander to the Moon.

However, first launch of the Vulcan will now be delayed until the Centaur V upper stage tanks have been reinforced. A structural test version of the Centaur failed on the test stand earlier this year, and engineers have determined that the Centaur requires reinforcement of the fuel tank before flight to avoid a similar failure.

As a result, Vulcan will not be ready to fly until the end of 2023 at the earliest, and may be delayed a year or more by the setback and by other work necessary before launch.

In order to be certified for use on government security missions, Vulcan will need to have at least two successful missions flown, so this is likely to cause one or two payloads that the U.S. originally planned to fly on Vulcan to be moved to the approved alternate vehicle, SpaceX's Falcon 9.

ULA also operates the Delta IV Heavy and Atlas V vehicles. However, all of these that remain are already tied to specific missions. Any other missions added to ULA's schedule would have to fly on Vulcan, as the older vehicles are out of production.

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, which has since been completed. Elon Musk has publicly stated that this craft will fly on the next test aboard Booster 9.

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/bright-supernova-blazes-in-m101-the-pinwheel-galaxy/>

Penultimate Launch of Delta IV Heavy



Delta IV Heavy Launch, ULA Image

On June 22nd, United Launch Alliance sent NROL-68, a classified intelligence satellite, into orbit about its next-to-last Delta IV Heavy launch vehicle.

Prior to the introduction of SpaceX's Falcon Heavy launch vehicle, Delta IV Heavy was the U.S. vehicle with the greatest payload capacity, able to launch 63,000 lb into orbit, or half as much into geosynchronous transfer orbit.

The final launch of Delta IV Heavy is currently scheduled for late February 2024, from Cape Canaveral's Space Launch Complex 37, a short way south of Cape Kennedy's historic Launch Complex 39.

The Delta IV Medium variant of the Delta IV has already been retired. ULA's Atlas V launch vehicle has 11 remaining contracted launches before its retirement, which will mark the end of these two historic rocket families.

IN THE SKY THIS MONTH

The Moon:

Full Moon, July 3rd

Last Quarter, July 10th

New Moon, July 17th

1st Quarter, July 25th

Full Moon, August 1st

Venus is this month's bright evening star at magnitude -4.7. It will begin to move closer to the Sun though the later part of the month, as it approaches its conjunction with the Sun on August 13th.

Mars continues to be a dim evening star, reaching a conjunction with the star Regulus in Leo on July 9th and 10th. Though much dimmer than it was at the start of the year, Mars is still magnitude 1.7 and will look very similar to Regulus' slightly brighter magnitude 1.4.

Mercury rises out of the Sun's glare this month, and on the 28th of the month lies less than 1/3 the Moon's width from Regulus, in Leo. Mercury will outshine Regulus, at magnitude -0.1 to Regulus' 1.4 (lower numbers are brighter.)

Saturn rises at about 11:30pm at the start of the month, but rises earlier each night until it is rising at about 9:30pm by month's end. It will also be getting progressively brighter through the month, starting at mag. 0.7 and brightening to 0.2. Its size will grow from 18 arcsec to 18.7 arcsec through the month as well for the planet itself, with the rings spread across about twice as much sky. It will make a fine sight in small telescopes as well as large ones, at 50-150x of magnification. Its ring tilt is a modest 8 degrees, in two years we will see those rings edge-on.

Jupiter rises at about 2am, moving to shortly after midnight at month end. It starts the month at a very bright mag -2.2 and brightens slightly to -2.4 by month end. It starts the month at 36.5 arcsec, as far across as Saturn's rings and gains a bit of width as the month progresses, ending at just shy of 40 arcsec.

Since summer often gives some clear sky

in the middle of the night between storms, night owls can benefit by getting a look at the two giant planets after midnight.

Uranus rises at about 1:30 am at the start of the month, to before midnight at the end. Its brightness is mag 5.8, which is too dim to be seen directly in our sea-level high humidity skies. It can be seen in binoculars or a telescope, and can be found using a finder chart. One chart is at: <https://in-the-sky.org//data/object.php?id=P7>

Neptune rises shortly after Saturn, following it by about 45 minutes time in the sky. At magnitude 7.9 it takes binoculars at minimum to see it. It can be found using a finder chart from: <https://in-the-sky.org//data/object.php?id=P8>

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/>

Club Calendar

July

3 Wildwood Summer Celebration at Wildwood Community Center, 6500 Powell Road. Our astronomers will be showing the sky before and after fireworks.

4 *Workshop and Space Academy Cancelled*
These activities resume on August 1st.

7 Exec Meeting, Fishhawk Rec Ctr, 11am

15 Fruitland Park Observing, Cales Field, dusk

18 General Meeting: Round Table Meeting on your interests in astronomy and what motivates you in astronomy. 6:30pm Laurel Manor Rec Ctr.

Club Calendar on the web:

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