VILLAGES STAR

Newsletter of The Villages Astronomy Club

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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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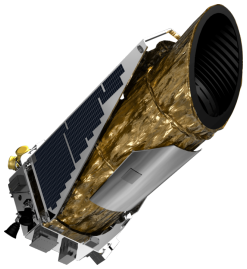
UPCOMING EVENTS

February 21st, 2023: Finding Other Worlds
For our February general meeting, Drake Shepard give another excitinng presentation. Many of us remember him for his talk *as* Albert Einstein last year (image, left).

In *Finding Other Worlds*, Drake will tell us about 14 unique exoplanets and 12 fascinating solar systems that the Kepler Space Telescope has found. Included with each exoplanet will be its location, size, distance from host star, temperature, atmospheric make up and special circumstances. Newly found exosolar systems will be compared and contrasted with our own solar system.



Kepler Space Telescope

Feb 18th, 2022: 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 500 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, observing begins as soon as dusk begins.

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

Feb 24th, 2023: Starry Starry Day and Night
Our next Starry Starry Day and Night will be held Saturday, Feb 25th at the Wildwood Community Center, 6500 Powell Road in Wildwood, FL.

During the day we will have a talk by Dr Terry Oswalt of Embry Riddle Aeronautical University's Astronomy Department, "Searching for Life in the Universe". Meanwhile our solar system guides will be giving tours of the solar system on our Solar Walk outside.

During the evening, we will share views of the sky with the public through our astronomers' telescopes.

Feb 24th & 25th: The Villages Outdoor Expo

From 10am to 3pm at Everglades Recrreation Center, we will be presenting our club at this year's Outdoor Expo. We will be oudoors, near the rec center's pool. We will be talking to Villagers about our club and what we do, and telling them about the Starry Starry Day & Night event at Wildwood Recreation Center.

March 3rd, 11am: Directors' Meeting
We will be holding our monthly Director's Meeting at Fishhawk Recreation Center, 2318 Buttonwood Run. The meeting lasts about 1 hour, and we discuss planning for upcoming events and meeting, club finances and other business. All members are welcome.

March 7th, 5:30pm: 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.)

At this month's meeting, we should have a period of darkness between dusk and moonrise to view Comet ZTF. It will be in the constellation of Auriga that night. Sky conditions permitting, we will show it in telescopes there. Feel free to come to see the comet that night, and to bring friends!

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 conditions permitting those with telescopes should be able to share views through them.

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

NEWS

Comet C/2022 E3 ZTF

Comet ZTF has been an elusive target for those of us here in The Villages. At the start of January, seeing it required looking shortly before sunrise. As the month went on, it rose earlier and earlier. However, the Moon also became bright late in January, which hid the comet from view with our typical sky haze.

Dave Scruggs sends us this report:

I took my parents out to Michael's dark area on Monday night way behind the Lake Square Mall on the edge of Lake Griffin. The nearest street light was a mile away. And we were able to see it with Michael's binoculars. It looked like a baby's baby pinky finger print. There was a slight coming and going haze, along with the brightness of the moon. But we got to see it while being serenaded by the frogs.

But we had fun, and we hope everyone gets a chance to see this once in a lifetime event.

Dave Scruggs
The Fruitland Park Astronomy Group

President Mark Graybill was able to see it near New Moon, when it was located near the constellation Bootes:

It was very dim and diffuse, but I was finally able to identify the comet because it was the cloud that wasn't moving. I used 7x35 binoculars. It had a well described outline, but other than being very oblong it didn't show any color or other signs of being a comet. The sky

closed in before I could get a telescope out.

From Harry Orlind, Village of Citrus Grove, comes this report from Jan. 26th:
I got out to look for the comet after midnight last night and once a got my sky directions straight, It was easy to find in my 15x70mm binoculars and then in my 8X42mm binos. Visually not much more than an slightly elongated fuzzy spot but at least I saw it.
Kinda looked like a dimmer, smaller M31. Try to wait till moonset when skies will be darker.

Bill Pappas replied (via our Facebook group): I saw the smudge last night as well with bino. Going to bring scope out tonight if it remains clear.

Comet C/2022 E3 ZTF as imaged by member Frank Masciulli on the morning of January 27th, posted in our Facebook group.

Others have reported mostly frustration in trying to see the faint, diffuse comet. Our cloudy and hazy skies, coupled with bright moonlight, make dim diffuse objects very difficult to observe.

Best Nights to View

While it falls past the comet's closest approach to Earth, the dates of February 6th through the 12th offer time in which to view the comet without obscuring moonlight. On those nights, the Moon will rise late enough after sunset to give time to view the comet, should our evening sky remain clear. On the 7th, there should be about 90 minutes of dark, moonless sky, with the comet high in the constellation of Auriga against a Milky Way backdrop. Keep your Messier chart close to hand so that you don't mistake any of the star clusters in the area for the comet. (Charles Messier originally created his famous catalog of non-stellar objects as a list of things to not mistake for a comet!)

At this month's Telescope Workshop, we hope to be showing the comet to our members and the public. (See announcement above.)

Florida Starship Launches

SpaceX is currently working toward their first orbital flight of the massive new Starship launch vehicle. Since last month's newsletter, additional news on its future have become available.

In Texas, work is currently focused on the static fire of the first stage of the Starship (called the booster.) In this test, all 33 engines of the stage will be started as they would be for an actual launch. The stage will be locked down to its launch stand, and the second stage has been removed for this test to receive its own preparation for launch (removal of lifting lugs and final heat shield work.)

The static fire is planned to occur within the next week if all goes well. If successful, SpaceX will apply for a launch license from the FAA. Once that is received, the first orbital launch will occur

from the Texas test site within a few weeks.

The test flight will attempt to carry the Starship second stage to a single orbit of the Earth. The second stage (called “the ship” or Starship) will re-enter near Hawaii where the Space Force will be able to monitor its flight into the atmosphere for SpaceX. Meanwhile, the first stage booster will have attempted to do a mock recovery into the Gulf of Mexico to test its ability to return from flight for reuse, similar to the first stage of the Falcon 9. No attempt will be made to recover the booster, this will simply be a first attempt to simulate recovery.

The entire flight test is a high risk venture. If the flight reaches the point of stage separation, that by itself would be a dramatic success of the first flight of the booster, which is more powerful than the first stage of the Saturn V. Should the second stage then achieve orbit, this is another major milestone of success. After re-entry, there are many observers who doubt that the Starship’s heat shield will successfully protect the vehicle. It is thought that SpaceX may be designing a new style of heatshield for future Starships now, so a successful re-entry and simulated landing of the Starship’s second stage would be an unexpected technical tour-de-force on top of the prior successes during the launch.

Florida’s Part

Once initial testing is complete, SpaceX states that Florida launches will begin as soon as the vehicle is ready for operational flights. Presently, there is a single Starship launch complex well under way in its construction at historic Launch Complex 39A, the same launch area where Apollo 11 launched to the Moon.

In addition, components for two additional launch complexes have been seen under construction at SpaceX’s facilities near Cape Kennedy. Now it is known that SpaceX has entered into a land use agreement for the area known as Launch Complex 49, north of the current Launch Complex 39B at which Artemis I launched last year. Originally part of the LC-39 complex set aside for notional crewed missions to Mars and Venus in a continuation of Apollo through the 1970s, this land was redesignated as a possible facility for a vertical takeoff/horizontal landing facility in this century. With the vehicle behind those plans cancelled, it again became available.

Now it appears that SpaceX will be building two more massive Starship launch facilities on that land, probably this year.

SpaceX’s Moon Lander Starship

Plans for Starship extend far beyond Earth orbit. While Starship was originally envisioned as a means to carry humans to Mars, at present it has a target closer to home: the Moon. NASA has contracted SpaceX to develop a version of Starship that will land Artemis III astronauts on

the Moon's surface, then return them to lunar orbit.

In order to go beyond Earth orbit, the Starship will need to be refuelled in space. Special tanker versions of the Starship will carry fuel up to an orbiting Starship to allow it to go on from there to the Moon, or Mars, or beyond. It is estimated that about 7 tanker flights will be needed for each lunar Starship to refill it. Only the reusability of the Starship will make this economically possible. If each rocket were disposed of after flight, as in Saturn V, then the costs would be...astronomical. But with re-use, of a vehicle that will be targeting 100 uses before retirement per Elon Musk, the primary cost becomes not the rocket, but the fuels, the propellants, used in the rocket.

In fact, Elon Musk has stated that Starship, because it is fully reusable, will be cheaper to fly than Falcon 9, which expends at least its second stage with each flight.

These tanker flights are expected to launch from the two new launch complexes being built at LC-49 at Cape Kennedy. The pair of launch pads will allow a rapid launch cadence, as well as backup in the event of a problem at one pad. The lunar lander itself will launch from LC-39A's pad.

The current schedule calls for the first lunar lander test flight to go to the Moon in 2023, with the actual landing in 2024. However, the current pace of work makes a test flight in 2024 with the actual crew landing in 2027 appear more likely, as Artemis III is most likely to be ready to fly at that later date.

IN THE SKY THIS MONTH

The Moon:
Full Moon, February 5th
Last Quarter, February 13th
New Moon, February 20th
1st Quarter, February 27th
Full Moon, March 7th

This month we lose **Saturn** from the sky as it heads toward solar conjunction on the 16th of this month. That means that it is directly behind the Sun from Earth's point of view.

Saturn reaches conjunction every 378 days. It disappears in the Sun's glare 18 days before conjunction, then reappears in the dawn sky just ahead of the Sun 18 days after conjunction.

Saturn's Solar Watch Clock:
Solar conjunction: 0 Days
Reappearance at dawn: 18 Days.
Retrograde motion begins: 125 Days.
Opposition: 189 Days
Retrograde motion ends: 253 Days.
Disappearance in solar glare: 360 Days.
Solar Conjunction: 378 Days.

This calendar of events has been known since the days of ancient Sumeria, as well as the cycles of Mars, Jupiter, Venus, and Mercury. While they can't be said to have had a sun-centric view of the solar system, they avoided the issues of epicycles and such of later geocentric views by concentrating their study on each planet's own cycle relative to the Sun.

By this clock, we can see that Saturn will reappear on March 6th.

Jupiter is heading toward its own solar conjunction on April 11th, but for now it is still high in the evening sky providing a beautiful show of its belts and zones. Its four largest moons (of the 79 we currently know about) are visible at low magnifications and even in binoculars.

Mars remains high and bright this month, though it is far smaller than when it was at its closest and largest late last year. Its angular size has come down from 16 arcseconds then to 9 arcseconds now. Large surface features are still visible, though with far less detail than at opposition. We are currently still about 6 months away from the martian summer season that brings dust storms that obscure the surface, so we expect to be able

to continue to view it without losing detail to those. Features can be observed in most amateur telescopes as low as 50-100x magnification even under current conditions. Detailed examination of Mars requires an excellent mount and guidance system to support relaxed long duration viewing at magnifications up to about 450-500x. Either an excellent refractor of 4” aperture or a reflector or catadiaoptric scope (Schmidt-Cassegrain or Maksutov) of 8” aperture or greater is recommended.

While Saturn has left our evening sky, **Mercury** has appeared in our morning sky. It reached its highest altitude on Jan 30th, and is now descending toward the Sun again. See it this month while you can, if you’re an early riser. If you aren’t, then in April we will see Mercury at its highest in the evening sky again.

Venus will remain our evening star this month, continuing to rise higher and higher at sunset. It is at a nearly full phase, being 89% illuminated at mid-month. A variable polarizing filter can sometimes bring out details in Venus’ clouds, but normally there are no details to be seen in white light observation of Venus.

Star Clusters

This season is an excellent one for viewing open star clusters in the Milky Way. The two large star clusters near us in our galaxy in Taurus, **the Pleiades (M-45, aka The Seven Sisters)** and **Hyades** make excellent binocular objects or low power objects in a telescope. Mars sits above the open end of the V formed by the Hyades this month, with the bright star Aldebaran (the Eye of the Bull) marking the one end of the V.

Likewise, the **Alpha Persei Moving Group** is a broad cluster of yellow stars that is nearby within our galaxy. Looking at Alpha Persei (the brightest star in Perseus, at the junction of its Y-shape) will reveal this group.

In the constellation Auriga lie the clusters **M-36, M-37 and M-38**. Visible in binoculars as condensations of stars against the Milky Way background through Auriga, they lie in a row from just outside the lower edge of the “football” shape described by Auriga’s hexagon of bright stars in toward its upper center.

In Gemini, at the feet of Gemini the Twins, lies cluster **M-35**. Nearby clusters **NGC-2128 and NGC-2175** are visible in the same binocular view, or a short hop away in a low power telescope.

In Canis Major below Sirius is bright **M-41.** Left of Canis Major are a number of clusters, making for rewarding scanning with binoculars or a rich telescope field (low power, wide angle.) **Avery’s Island, the Doublemint Clusters**, and others spangle the sky in this region.