VILLAGES STAR

Newsletter of The Villages Astronomy Club

Volume 4, Number 9
September 2023

Club Website (Currently Unavailable):
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

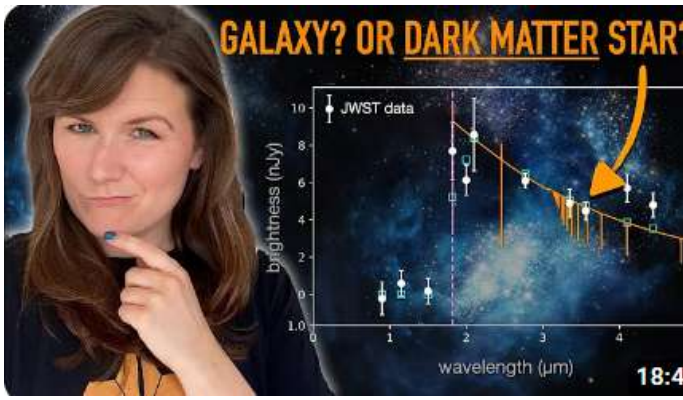
Newsletter Contact
saundby@gmail.com
(please include TVAstro in subject line)

UPCOMING EVENTS

Executive Directors' Meeting, September 1st, 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 will be reviewing this years' Camp Villages activities, and planning our many fall activities, including our Starry Starry Day and Night on October 7th, the Solar Eclipse viewing on October 14th, and our regular meetings and activities.

Join us at Fishhawk Recreation Center, 2318 Buttonwood Run, from 11a to 12p.

September 5th: Space Academy and Telescope Workshop!
Join us on our first Tuesday meeting night, when Space Academy will start at 6:30pm with videos featuring Dr Becky Smethurst with "Has JWST found supermassive DARK MATTER stars?" and Alex Filippenko's "Glorious Total Solar Eclipses." Each video will be followed by open discussion of the subject matter.



The Telescope Workshop will begin at 7:00pm at the picnic pavilion, weather permitting. In the event of inclement weather, the workshop will move inside to the same room as Space Academy after the videos.

The Telescope Workshop is for users of telescopes and binoculars to learn more about how to use their instruments, share tips and tricks, and an opportunity to view the sky with other club members after dark.

Both events are at Truman Recreation Center, 2507 Canal Street.

September 16th, 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.

General Meeting, September 19th, 2023: The James Webb Space Telescope by Ken Katta

This month's general meeting will feature a presentation on the James Webb Space Telescope by our Vice President, Ken Katta. Ken will discuss the construction of the telescope, its instruments, and its orbit around the Earth-Moon system in deep space.

He will also tell us about recent discoveries and how they affect our understanding of the cosmos.

James Webb Space Telescope Mirror Assembly

ERAU Astronomy Open House

Embry Riddle Aeronautical University's Astronomy Department will be having their first open house of the new academic year on Saturday, September 23rd. There will be a public lecture in the Willie Miller Auditorium at 7pm, followed by observations of the sky at the College of Arts and Sciences. For further information, see the website at: https://observatory.db.erau.edu/index.php/astronomy-open-house

We will be arranging carpooling for members who are interested in attending at this month's meetings. Or, you can contact Ken Katta to arrange for giving or getting a ride: (917)620-1081

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

NEWS

Club Website Returns!

After a brief outage caused by our web host service suddenly going out of business, our website is back online!

At present, not all functions of the website have been restored. The site currently features a home page, and has a functioning security certificate so that your browser doesn't issue security warnings when you access the page.

The calendar, newsletter archive, and contact pages will be restored soon. Our photo galleries and other pages will return after that.

The website is undergoing a design overhaul to make it more accessable using current web technologies. This will allow it to look good and be usable on all devices from phone to computer to your TV's web browser. Also, we will be adding cues to support screen readers. The intent is to build a website that is easy to maintain while being useful to all our members.

Hurricane Idalia and Astro Observing

While hurricanes have a negative impact on observers during their approach and passing, spreading clouds and raising humidity levels, after a hurricane passes can often provide 2-3 nights of exceptionally clear and humidity-free skies.

Typically, hurricanes entrain dry air in their wake, making the evenings after a hurricane has passed very good for observing objects that are normally not easy to see through the humidity.

Our normal summer skies make the observation of galaxies, planetary nebulas, and reflection nebulas very difficult.

While Idalia passed us in a way that has left our sky clou8dy and humid immediately after its passing, a patch of dry air that is over the Gulf is headed our way and may grace our skies with the clearest skies we'll see this summer on the evenings of the 31st to the 2nd of September. Observers should keep their eyes out, and keep an eye on Astrospheric or their favorite sky condition tracker for the arrival of this clear air patch.

As with any weather phenomenon in Florida, there's a chance the patch will miss us entirely, but if we don't watch for it we stand a chance to miss a great night to get out and observe summer galaxies and nebulae while they are high in our sky in the evening.

If we do get a clear evening or two, have a look at these objects:

Lagoon Nebula (M8)
Trifid Nebula (M20)
Leo Triplet (M66 group of galaxies)
Omega Nebula (M17)
Ring Nebula (M57)
Veil Nebula (NGC 6960, 6995)
North America Nebula (NGC 7000)
Pelican Nebula (IC 5070)

Soviet Satellite Struck by Space Debris

A Soviet Strela-1M satellite was struck by an unidentified space debris object causing it to break up into at least 7 pieces. This satellite was a communications satellite used by the Soviet Union, launched in 1991 and defunct since 1992. This design of satellite had a short design lifetime, only a year or two, and were launched by the Soviet Union from 1971 to 1992 before being replaced by the longer-lived Strela-3 satellites. Including the one that was struck, there are still 360 out of 368 of these satellites still in orbit, decades after their decommissioning.

In service, these satellites were used to facilitate overseas communications of the KGB and GRU secret security services of the USSR by recoding uplinked transmissions and playing back stored recordings on command from ground stations.

SpaceX Starship Flight Test Imminent

The second integrated flight test of SpaceX's new Starship launch vehicle is expected to occur soon, possibly within the next week, based upon preparations observed at SpaceX's Starbase facility in Boca Chica, TX.

Last April, SpaceX conducted the first test launch which managed to depart the launch pad, transition to supersonic flight, and approach the point of staging before problems with the vehicle caused it to fail and self-destruct. That launch caused significant damage to the launch facility as the 17 million pounds of thrust from the rocket broke and undermined the concrete beneath the launch pad, sending concrete hurtling into nearby storage tanks, media vehicles, and buildings (the areas affected were clear of personnel, so there were no injuries.)

Since then, SpaceX has rapidly rebuilt the launch pad, adding a huge steel deluge plate underneath to protect the ground and absorb the energy of Starship's 33 Raptor engines. Multiple tests conducted in August appear to confirm that the plate successfully diminishes the force and protects the concrete from all but minor damage, and eliminates the creation of concrete projectiles.

The Starship's first stage, Booster 9, has undergone a full range of tests including tanking, spin-prime, and static fire tests. Observers believe that the stage is ready to have Starship 25 stacked on it for flight.

For its part, Starship 25 has had its engines installed and tested, and is having final work done on its heat shield as of this writing. Progress by SpaceX has been so rapid that it's necessary to check current live video feeds to see where SpaceX is in their progress.

Static Fire Test of Booster 9, August 28. SpaceX

The Flight

This flight test is expected to follow the same plan as the first flight test in its general trajectory and objectives. The intent is to launch the Starship to orbital velocity, with the booster performing a mock re-entry and return, similar to the first stage of the Falcon 9. For this test, however, the booster will not be recovered, but ditched in the Gulf of Mexico.

The Starship will continue through space for most of a single orbit, then re-enter on an approach north of Hawaii, where a Space Force test range will be able to monitor it on its approach, providing additional data on its re-entry flight. Should the Starship re-enter successfully, it will ditch in the Pacific ocean after performing the same maneuvers as it would for a recovery. Unlike the Falcon 9, the Starship's second stage is designed to be recoverable and reusable. This capability is expected to be used in future flights, but for this test both Starship stages will be expended and not recovered.

Design Changes

While the test plan remains much the same, there have been changes to the Starship since its last flight other than the addition of a deluge plate under the launch mount.

Booster 9 features an upgraded set of Raptor engines, and a new engine gimbaling system. The Raptors on Booster 9 have received many changes to their design, compared to those used by Booster 7 on the first flight test, improving their reliability while also simplifying their design. So far, the results of the spin-prime and static fire tests appear to confirm the value of the changes, but we'll have to see how well the engines perform during the actual flight test, under full power and full flight duration, to be sure.

During the first flight test, Booster 7 steered itself using a pair of hydraulic systems to move the center 13 engines to vector their thrust off-axis. The outer ring of 20 engines are fixed in place, but the two center rings of engines, 3 at the center and a ring of 10 around that, are able to swing approximately 5 degrees in any direction.

At least one of the hydraulic systems failed in the first flight, and there was in internal fire in the Booster associated with the hydraulics as well. Booster 9, however is of a new design that eliminates the hydraulic systems, using electrical actuators to gimbal the engines instead. The electrical system has included design elements from the Tesla vehicles, incorporating safety and ruggedness elements designed into the Teslas to withstand auto accidents. The design is believed to be far safer and more reliable than the prior hydraulic gimbal design.

Another key design change is the technique the Starship will use to depart the Booster vehicle at staging. The first test flight intended to use a fairly complex technique where the entire vehicle rotates to an attitude crossways to its direction of travel, the two vehicles separate, then each rotate around their individual centers of gravity to separate. Known as the "kick-flip", this maneuver was believed to be one of the riskiest elements of the first test flight. Whether it would have succeeded is unknown, as the vehicle's controller never commanded stage separation

because it departed from the flight envelope it was allowed due to problems with the first stage that mounted up during flight.

However, SpaceX has decided to move away from the kick-flip to what is known as “hot staging”, where the second stage fires its engines to leave the first stage before the first stage’s engines have fully shut down. This simplifies the staging process, and allows the second stage to make sure that its propellants are settled in its tanks before firing its engines (the rotation of the stage during the kick-flip would have performed the function of settling propellants, which is critical to starting the engines without having a bubble in the propellants possibly causing an explosion at engine startup.)

Other launch vehicles, including Titan and Soyuz, have used hot staging successfully in the past, so this is a proven technique.

To accommodate hot staging, SpaceX has added a staging ring to the top of Booster 9 (image at left, note workers for scale). It includes a shield to protect the booster from Starship’s engines, and vents on the side of the ring to allow the hot gasses to escape.

The overall effects of hot staging in reducing the time spent staging, and in maintaining velocity of the craft during this phase of flight are estimated to improve the efficiency of the Starship system significantly, allowing up to 10% more payload capacity than when using the kick-flip maneuver.

Remaining Work

Once Starship 25 has its heat shield fully installed, it will be ready to be moved to the launch pad to be stacked atop Booster 9. While SpaceX has already received clearances for flight space restrictions from the FAA for the first 10 days of September or so, they are still waiting on the confirmation of a launch license from the FAA. This is expected to be granted within about 48 hours of the actual launch time, rather than any farther in advance. SpaceX has a number of issues to address from the last flight, most prominently the failure of the flight termination system to destroy the Starship for over 40 seconds (the termination charges went off, but the vehicle didn’t break up until it entered a lower part of the atmosphere where aerodynamic forces finished the job). SpaceX has already run a test of an improved flight termination system, and site watchers have seen a second test article placed where the first test was performed, perhaps signalling that the FAA wants to see a repeat of the new system’s test, or a test under different conditions than the first. It’s unknown if this is the case, and outsiders will only know when the launch license is granted.

Seeing the Launch

While the launch will not be directly visible from The Villages, there are several outlets that will be providing video coverage of the launch live when it occurs, including SpaceX's own livestream:

SpaceX - Starship
LabPadre - YouTube
NASASpaceflight - YouTube
Everyday Astronaut - YouTube

IN THE SKY THIS MONTH

The Moon:

Last Quarter, September 6th
New Moon, September 14th
1st Quarter, September 22nd
Full Moon, September 29th
Last Quarter, October 6th

Saturn was at opposition on August 27th, and will remain very bright and large throughout this month. It is 19 arcseconds across at its disk, and twice that for its rings, making the rings almost as large in view as Jupiter's disk. At magnitude 0.5 it is a bright star in the east near sunset, rising higher as the month procedes until it reaches its highest point at about 9:30pm in the evening at month end.

Saturn is visible in both binoculars and telescopes of any size. It requires at least 40x magnification to make out the rings. At 75x and greater, bands within the atmosphere will be visible, as well as the Cassini Division within the rings.

Saturn's brightness, even in small telescopes, can wash out its features. If you can't see Saturn's features in your instrument, try the trick of blocking part of your aperture to reduce Saturn's overall brightness and bring out low contrast details. Vary how much of the aperture you block to see if it brings out different details in the rings and atmosphere.

Yellow, blue, and green color filters can bring out details in Saturn's atmosphere as well. Blue will tend to bring out the light methane ice in the upper atmosphere, green will bring out darker atmospheric bands, and yellow will tend to act as a dimming filter to help improve contrast.

Neptune rises shortly after Saturn, following it by about 45 minutes time in the sky. At magnitude 7.7 it takes binoculars at minimum to see it. Telesciope will see it as a blue non-stellar object. Most telescopes can catch its brightest moons as well. At 2.4 arcseconds in size, it takes about 75-100x magnification to display any sign of a disk, and much higher magnification to have any chance of showing surface detail, from 250-500x, and a suitable sized instrument (at least 6-8 inches, with the smaller size for an unobstructed instrument, larger for an instrument with a secondary mirror in the optical train's field of view.) Atmospheric features on Neptune are generally too subtle to be visible, but occasionally a storm will occur that is far lighter than the rest of the disk.

Neptune will reach opposition on September 18th, but the view will not be significantly different than for the rest of the month.

Online finder chart for Neptune:
https://in-the-sky.org//data/object.php?id=P8

Jupiter rises at a better time for evening observers this month, rising at about 9pm at the begining of the month, getting a little earlier each night until the end of the month when it rises shortly after 7pm.

At about 50 arcseconds of diameter, magnifications of about 40x will show a disk, with magnifications of 75-100x being optimal for observing the disk and general details on it.

The bands will be easily visible at this magnification, as they are higher contrast than those of Saturn. Still, blocking part of your telescope's aperture to dim the view will help bring out subtle details on Jupiter, like the Great Red Spot, which has been difficult to tease out of the Southern Temperate Band for the past decade

or so.

Four of Jupiter's moons are visible in binoculars or small telescopes. If you note the positions in which you see them, and the time of your observation, you can look up which moon is which on one of the online Jupiter Moon trackers, such as this one from Sky and Telescope Magazine:
Jupiter's Moons

Venus is a morning star right now, greeting early risers. It will reach its greatest illuminated extent on September 19th as its elongation (distance from the Sun) increases through the month and into October.

Venus shows a disk at about 40x magnification, but shows no details other than its phase. Seeing details in Venus's clouds requires a variable neutral density filter and lots of patience, and even then only shows some minor variations in brightness.

Mercury has joined Venus in the morning sky, and will only be visible during morning twilight this month. On the 22nd is will display a last quarter phase, and will reach greatest illumination right at the end of this month and the beginning of October. It is visible by eye or in binoculars, and in a telescope about 120x will show a disk with little or no detail other than phase and color. Take care not to accidentally view the Sun by finding it by starting on the Sun side of Mercury and sweeping away from the Sun to find Mercury in your telescope (without ever viewing the Sun, of course.)

Mars sets during twilight this month, only being low in the west throughout the month as sunset becomes earlier each day. At only 3.7 arcseconds of diameter, it is a small object requiring medium powers of magnification (200-300) to view any surface detail. Only the largest features will be visible, and poorly, because of the light in the sky and the continuous low level haze caused by our humidity in this time of year.

Uranus rises about half an hour after Jupiter, and is at magnitude 5.7 which is too dim to be seen by eye under our local conditions. It can be seen in binoculars or a telescope, and can be found using a finder chart. It appears as a greenish or bluish non-stellar object. Chart:
https://in-the-sky.org//data/object.php?id=P7

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

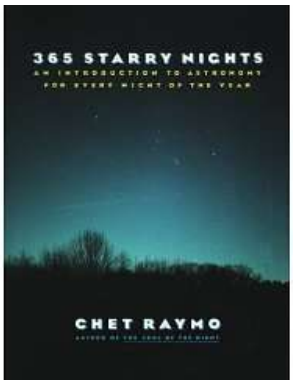
More information on sky events this month:
https://in-the-sky.org/

Resources From Our Members

At our August meeting, we held a Round Table where our members shared some of their favorite astronomy resources. Books, magazines, websites, YouTube channels, phone and tablet apps, software, etc.

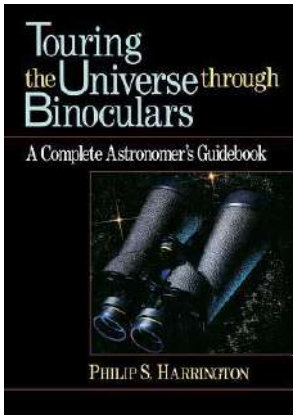
Here are resources that our members shared:

365 Starry Nights, by Chet Raymo (book)



This book gives a gentle introduction to the stars and constellations through naked-eye astronomy by having an entry for each night of the year. With copious drawings to guide the user and illustrate the text, it's an easy read that can be picked up and laid aside at any time while being read in snippets.
https://www.goodreads.com/book/show/1589836.365_Starry_Nights

Touring the Univese Through Binoculars by Philip S. Harrington (book)



An introductory book to the sky and objects that can be observed with binoculars or any telescope. Includes directions on locating objects, what to expect to see, and tips for successful binocular astronomy.
https://www.goodreads.com/book/show/1006191.Touring_the_Universe_through_Binoculars

The Night Sky Observer's Guide by Kepple & Sanner (books, 3 vol.)

A very detailed list of the double stars and deep sky objects in each constellation. The set includes 3 volumes covering the entire sky. A key element is that the descriptions provide descriptions of the objects in different sized telescopes, so the reader will have an idea of what they will see when they view the object through their own instrument.
https://www.goodreads.com/book/show/1006423.The_Night_Sky_Observer_s_Guide

The Observing Handbook and Catalogue of Deep Sky Objects by Luginbuhl and Skiff (book)

A more brief listing of deep sky objects that also gives reports of views through different sized telescopes for each object. More limited in scope than The Night Sky Observer's Guide, and it requires the use of a separate sky atlas as no finder charts or illustrations are provided, but this makes the book more compact than The Night Sky Observers Guide.
https://books.google.com/books/about/Observing_Handbook_and_Catalogue_of_Deep.html?id=MwCyjQpGU7UC

Dr Becky Smethurst (online video)

Dr Becky is a working astrophysicist specializing in black holes in the U.K. who also does YouTube videos on various subjects in astronomy.
https://www.youtube.com/@DrBecky

Anton Petrov (online video)

Anton Petrov is a YouTube personality who does videos on astronomy and astrophysics subjects as well as math and occasional fringe science topics.
https://www.youtube.com/@whatdamath

Space.com (website)

Website covering space news and events, including astronomy and space exploration. This site tends to be heavy on ads and pop-ups, but carries many good articles.
https://www.space.com/

Stellarium (computer software/app)

Stellarium is a planetarium program that is free and open source software for all of the major computer platforms, and is available as a commercial app for mobile devices (with a free basic vesion.) The mobile version includes the ability to point your device at the sky to get a live astro-map.
https://stellarium.org/

An online web version of Stellarium is available as well:
https://stellarium-web.org/

Sky & Telescope (magazine/website)

Sky & Telescope is one of the two leading astronomy magazines worldwide. With news on research and events, a monthly observing section, and industry-leading reviews of astronomy products they continue to be the premier astronomy magazine after over 100 years of publication. Their website features many free resources including current finder charts for the outer planets and asteroids, guides to observe specific objects, and a live star chart:
https://skyandtelescope.org/

Astronomy (magazine/website)

Astronomy Magazineis similar to their venerable competitor Sky & Telescope, but has always managed to distinguish themselves. Often more beginner-friendly, many find their writing and content layout more approachable than S&T. [Mark: I subscribe to and read both magazines!]

Their website also includes current news, observing aids, and articles on astronomy and space research:
https://www.astronomy.com/

Observer's Handbook by The Royal Astronomical Society of Canada (book)

The Observer's Handbook comes out each year with information about the year's events and observing opportunities for different objects organized by date through the year:
https://www.rasc.ca/handbook

SkyPortal App

SkyPortal is a free app provided by Celestron that allows you to navigate through the sky with your Android or iOS device, including virtual reality overlays for iOS devices. It includes both a Compass Mode, following the location of the device to identify items in the sky, and a Planetarium Mode, allowing the user to explore the sky in the future and past up to 100 years.

Owners of Celestron telescopes with compatible wi-fi control systems can also use the app to control their telescopes.
https://www.celestron.com/pages/skyportal-mobile-app

Abebooks (book search website)

Abebooks is a used book search site, with independent bookstores around the world listing their wares for sale. Owned by Amazon, some Abebook listings appear on Amazon's site, but many do not. The search options and listing information on condition and availability are superior on the Abebooks site. It is a great resource to find affordable copies of out of print astronomy books:
https://www.abebooks.com/

Science Book Club (organization)

The Science Book Club chooses a science book to read and discuss at regular Zoom meetings. Emphasis is on new theories and conceptual frameworks of science. To join, please contact Pauline Schwartz or our Vice President Ken Katta:
PSchwartz@newhaven.edu kkatta@aol.com

Moon Globe HD App for iOS

The Moon Globe HD app provides iOS users with detailed data about the current Moon phase, rise and set times, and detailed maps of the lunar surface and craters. Useful for both naked-eye and telescopic observation, the app can give information on what you're seeing even at high powers at the eyepiece.
Moon Globe HD on the App Store

Daff Moon Phase App for Android

Daff Moon Phase is a similar app for Android, providing lunar observing information, position, illumination, and it includes information on the planets as well.
Daff Moon Phase - Apps on Google Play

Lunar Map HD App for Android

Lunar Map HD provides a similar mapping function for Android to that of Moon Globe HD on iOS. It gives detailed maps of the lunar surface and craters suitable for use at the eyepiece during observation.
LunarMap HD - Apps on Google Play

Astro Aid App for iOS

Astro Aid provides previews of what you will see in your telescope or through your camera. You can input the particulars of your optics, and it will give you visual and photographic previews of objects in the sky including the area of sky observed, and the brightness and details of the objects observed.
AstroAid on the App Store

Tonight's Sky (website)

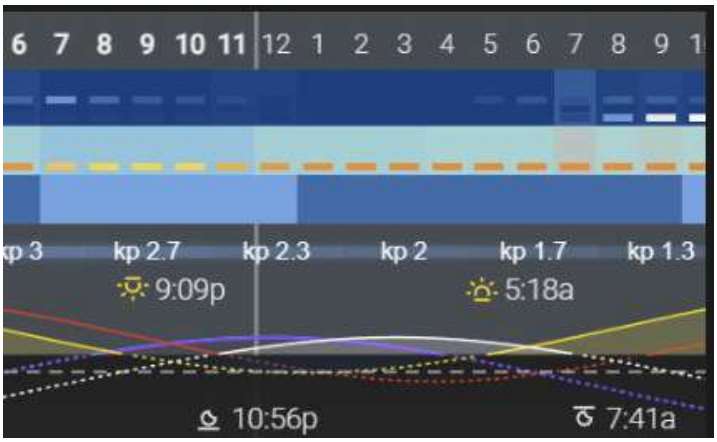
Tonight's Sky is a series of videos provided by the Space Telescope Science Center showing the

constellations that you can expect to see for the current time of year:
Tonight's Sky

Astrospheric (website/app)

Astrospheric is a detailed weather prediction program for astronomy. It provides information on cloud cover and precipitation, transparency of the sky, and seeing conditions (stillness of images based on atmospheric conditions.)

It is available on the web, and as an app for iOS and Android.
Web: https://www.astrospheric.com/
Play Store: Astrospheric - Apps on Google Play
App Store: Astrospheric on the App Store



Clear Sky Charts/Clear Sky Clock (website)

You may have seen the colorful "Clear Sky Clock" on astronomy websites, showing viewing conditions for the website's location--such as observatory websites, park websites, etc.

These individualized sky conditions are based on data from Clear Sky Charts, which uses compiled meteorological data to predict viewing conditions at different locations based on sunlight, light pollution, moonlight, cloud cover, humidity, wind, atmospheric temperatures, etc.

The link below will take you to a map of Florida with different sites pinned that have a Clear Sky Clock generated for their location. Several private observatories near The Villages can be used to get an idea of our optimum local conditions, though they are outside the worst of our local light pollution (note that the map includes a slider to allow you to see the light pollution map overlaid on the general location map.)
Clear Sky Charts in Florida (Map)

NASA (website)

The NASA website provides news and information on current and past space missions, as well as preparations for missions planned for the near future.
https://nasa.gov/

Space Launch Schedule (website/app)

Space Launch Schedule is a website and associated apps for mobile that provides information on upcoming launches. It allows many forms of filtering, including by site, company, rocket type, nation, etc. Links to the mobile apps, Facebook and Instagram, and other means of engagement are included in the website's header:
Space Launch Schedule

Aurora Forecast (app)

To see when and where auroras are visible, the Aurora Forecast app gives maps, alerts, and well displayed graphical information. Note that Astrospheric (above) also provides information on aurora where they are visible, but Aurora forecast will show you where the auroras can be seen without being there.
My Aurora Forecast & Alerts on the App Store
My Aurora Forecast & Alerts - Apps on Google Play

Northern Lights Facebook Group

The public Northern Lights group on Facebook gives alerts and information on viewing and photographing the Aurora Borealis:
https://www.facebook.com/groups/618396774959983

Skyview Virtual Observatory (website)

"The Internet's Virtual Telescope." Created by NASA's High Energy Astrophysics Science Research Center, this site combines archived images of the sky and from sky surveys to produce virtual images of the sky as if seen by a telescope. With a depth of data on the observed objects, different ranges of the spectrum represented from infrared to gamma rays, it is a comprehensive virtual planetarium.
SkyView Virtual Observatory

Starmap App for iOS

The Starmap app provides detailed star charts and information for observing at an advanced level.
Starmap

Planets App for iOS

Planets is an app with detailed atlases and observing information for the planets in our solar system.

Planets on the App Store

Michael van Biezen Lectures (online videos)

Michael van Biezen provides lectures on many subjects in physics, from simple statics and mechanics, to more complex subjects such as engineering, electricity, graphical demonstrations of how mathematical equations work (such as the quadratic equation), and of course astronomy and astrophysics. With a total of over 9,800 videos online, you're sure to find a subject you're interested in presented in a clear and informative way!

Michael's videos appear on ilectureonline:

Physics

And on YouTube:

https://www.youtube.com/@MichelvanBiezen/

Spaceflightnow.com (website)

This website provides current news about spaceflight and rocket launches in clear, well written articles.

https://spaceflightnow.com/

Planisphere (star chart)

A planisphere is a sky map that can be rotated within a holder with a window to show the sky for any date of the year or any time of the night. By aligning your current time marking with a date on the outer ring, you can see what is up at any time, whether now, tonight, or next week.

When purchasing a planisphere, there is one thing you need to look for in particular: the latitude for which the planisphere was made. For our location, a planisphere made for northern latitudes from 20-35 degree are best. If you will be using the planisphere both here and up north, an in-between latitude like 42 degrees north (the most common planisphere latitude) will work while cutting off part of the horizon for the southern location and showing more to the south than you'll actually see from a location north of 42 degrees.

Quality plastic planispheres that won't succumb to dew are produced by Philips, Firefly, and Astronomy magazine, usually only for 42 degrees or more northern latitudes (avoid anything made for 50 degrees or higher for use in The Villages.)

There is also The Night Sky, produced by David Chandler, which includes a version for 30 degrees north, perfect for The Villages (we are at about 29 degrees.)

These planispheres are available through online retailers, science shops, and bookstores. The following are some sample links where they are sold:

The Night Sky 20-30 Degrees North (Amazon):

The Night Sky 20°-30°N (Large) Star Finder: David S. Chandler, David Chandler Company, Milky Way by Don Davis: 9780961320768: Amazon.com: Books

The Night Sky 30-40 Degrees North (Amazon):

The Night Sky 30°-40° (Small) Star Finder: David S. Chandler, David Chandler Company, Milky Way by Don Davis: 9781891938023: Amazon.com: Books

Astronomy Magazine Planisphere 42 Degrees N:

https://myscienceshop.com/product/81108?gad=1&gclid=Cj0KCQjwi7GnBhDXARIsAFLvH4k7MNpm_iTnOiGRrhPOrA6SLr_iRK_aVjBQ2OzBTYkpFUryxQ7YH0caAiKuEALw_wcB

Sky Map App for Android

Google Sky Map app is the mobile version of the Google Sky website for mobile devices:

Sky Map - Apps on Google Play

Google Sky (Web)

Google Sky

In-The-Sky.org (website)

In-The-Sky gives numerous detailed listings of current events in the sky, using your location to give precise information on timing and visibility. Events like eclipses, conjunctions, occultations, rise and set times, etc. are covered in a clear and simple way: In-The-Sky.org

NASASpaceFlight.com (website/online video)

Started by Space Shuttle enthusiasts decades ago, this website has grown into one of the premier space news destinations on the internet. Their YouTube channels include live cameras on the Florida launch complexes, Starbase at Boca Chica, Texas, and daily news updates on many different space projects.

The website features forums known for the participation of both working and retired aerospace engineers, including employees of SpaceX, who give inside tidbits of information that are not allowed to be reproduced elsewhere.

Their members-only archives include extensive image galleries, operations manuals from the Space Shuttle, ISS, and other space programs, and other similarly encyclopedic information on spaceflight.
Website: NASASpaceFlight.com -
YouTube: NASASpaceflight - YouTube

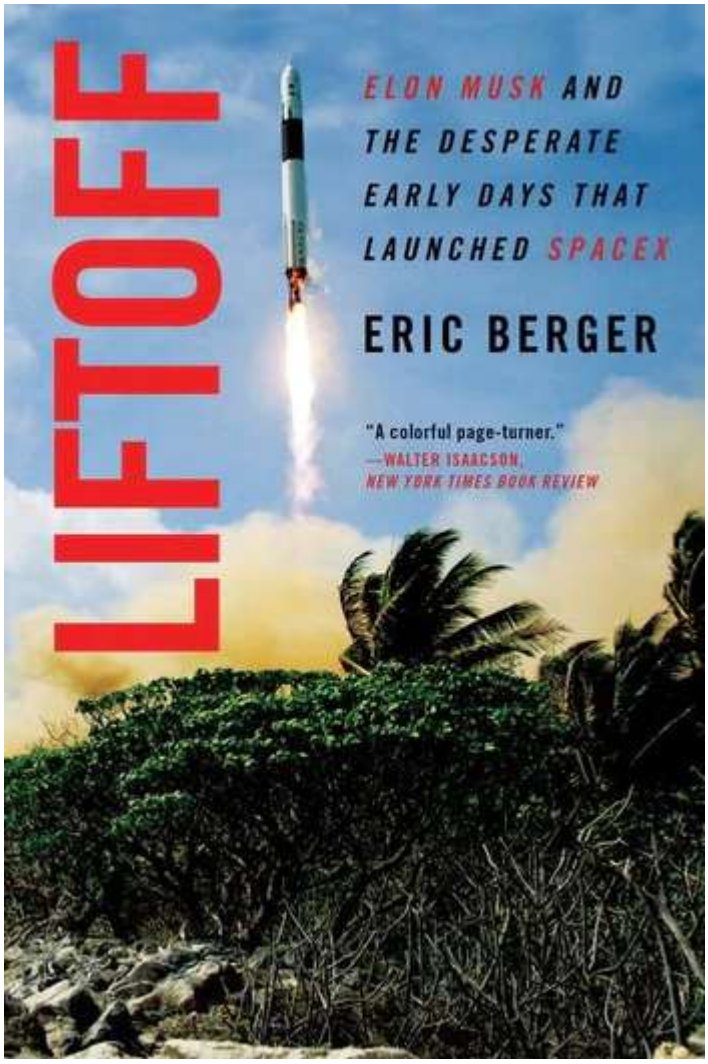
Liftoff!, Elon Musk and the Desperate Early Days that Launched SpaceX by Eric Berger (book)

Liftoff! is a book by Houston Chronicle and Ars Technica space reporter Eric Berger that gives an inside look at SpaceX's early days, from the events that drove Elon Musk to form a new startup before Tesla had even produced its first production vehicle to its domination of the space industry with the Falcon 9. Follow along through their mistakes, missteps, travails, and adventures in getting the company off the ground (literally) and into space.

The book includes many details not published in any other accounts, and is easily readable by non-technical readers while having just enough information to interest the technical reader that wants an inside look at SpaceX's technology.
Publisher's Site: Liftoff – HarperCollins

On Amazon: Amazon.com: Liftoff: Elon Musk and the Desperate Early Days That Launched SpaceX: 9780062979971: Berger, Eric: Books

Goodreads reviews: Liftoff: Elon Musk and the Desperate Early Days That Launched SpaceX by Eric Berger | Goodreads



LabPadre (online video)

The LabPadre channel on YouTube provides 24 hour/365 day live coverage of Starbase, TX, the build and launch site of SpaceX's Starship vehicle from 7 cameras in different positions with different views (for free, channel members have access to additional views.)

They also have a live camera watching Port Canaveral and Florida's launch sites, observing SpaceX's recovery operations as well as their launches from the east coast.

They release daily highlight videos, and weekly news videos, including video and information from other sources keeping tabs on SpaceX's activities.
[LabPadre - YouTube]

Club Calendar

September
1 Exec Meeting, 11am Fishhawk Rec Center
5 Telescope Workshop 7pm/Space Academy 6:30pm, Truman Rec Ctr
16 Fruitland Park Observing gates open 5pm, 300 Shiloh St, Fruitland Park
19 General Meeting: Ken Katta, JWST, 6:30pm, Laurel Manor Rec Center
23 ERAU Open House 7pm

October
3 Telescope Workshop 6:30pm/ *NO Space Academy this month* Truman Rec Center
6 Exec Meeting, 11am Fishhawk Rec Center
14 Partial Solar Eclipse, Homestead Recreation Center, 11am to 5pm, setup at 10am.
17 General Meeting: JB Smith, Cosmology of the Universe, Part 2, 6:30pm Laurel Manor Rec Ctr
21 Fruitland Park Observing, 300 Shiloh St, Fruitland Park, gates open at 5pm
27 ERAU Open House 7pm

November
3 Exec Meeting, 11am Fishhawk Rec Ctr
4 Starry Starry Night, Truman Recreation Center, 6:30-9:30p, Sunset 6:40pm, setup 5:30pm
5 DST Ends
7 Telescope Workshop 5:00pm/Space Academy 6:30p at Truman Rec Ctr
17 ERAU Open House
18 Fruitland Park Observing, 300 Shiloh St. Fruitland Park, gates open at 5pm
21 General Meeting: Toni Graybill, The Black Hole Zoo (Types of black holes), 6:30pm, Laurel Manor Rec Ctr

Club Calendar on the web (once the website calendar pag is restored):
https://vlgastroclub.org/calendar/

SpaceX Launch of Crew-7 to ISS, August 26th