VILLAGES STAR

Newsletter of The Villages Astronomy Club

Volume 6, Number 8
August 2025

Club Website:
http://vlgastroclub.org/

Facebook:
https://www.facebook.com/groups/vlgastroclub/

UPCOMING EVENTS

Executive Directors' Meeting, August 1st, 11am-12pm, Fishhawk Rec Center, 2318 Buttonwood Run

All members welcome to our monthly planning meeting. This month we'll reviewing 2025's Camp Villages and planning our fall event schedule. Members who are willing to assist our officers should attend so that we can learn about the skills you have to bring to the club and connect you with the tasks where you can assist us in running the club!

Space Academy, August 4th, 6:30pm Truman Rec Ctr, 2705 Canal St.

Vice President Ken Katta will be presenting a video by CalTech astrophysicist & cosmologist Sean Carroll on "Space, Time, & Gravity" this month, plus discussion of current astro news.

Observers' Workshop, August 4th, 8pm Truman Rec Ctr Pavilion, 2705 Canal St.

This month we will meet inside after the Space Academy meeting due to the likelihood of poor weather. If you have a telescope you need help with, we will be available to assist you inside, after Space Academy.

Fruitland Park Astronomy Group, August 16th, 5pm, 300 Shiloh Rd, Fruitland Park

Join us for an evening of observing and astronomy talk with the Fruitland Park Astronomy Group! Come to Cales Soccer Field in Fruitland Park, 300 Shiloh Road (at the corner of Shiloh Road and Dixie Avenue, north of the Fruitland Park water tower.) Enter on Shiloh Road (some GPS's will guide you to the Dixie Avenue entrance.) Gate opens at 5pm. We will stay as late as conditions permit and people are interested in observing. Bring power if required. You can set up off your tailgate.

Public is welcome to this event, no Villages ID required! Bring family and friends to view the evening sky with our astronomers!

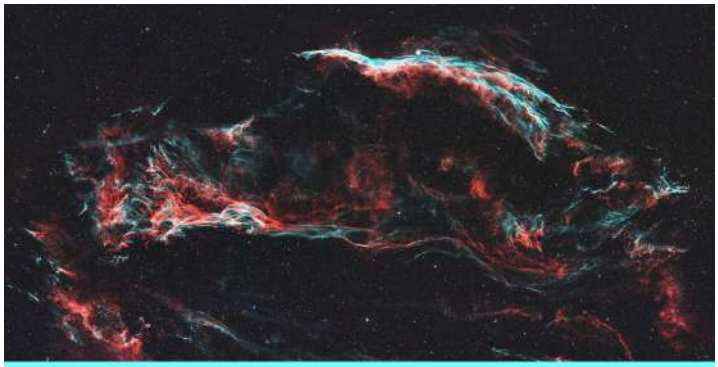


Image by member Craig Henry.
Western Veil Nebula in Cygnus

General Meeting, August 19th, 6:30pm: Round Table: Astronomy Resources

Join us at Laurel Manor Rec Center, 1985 Laurel Manor Drive, at 6:30pm for our fourth annual members' summer round table resources meeting! Come and share your favorite books, YouTube Channels, magazines, retailers, manufacturers, educational outlets, websites, discussion forums, and anything else that you find of value to doing or learning about astronomy!

These will then appear in our annual

Resources Issue of the club newsletter in September. See last September's issue for an idea of what kind of resources our members suggest. Pro Tip: It's OK to repeat things that have been noted before! Each year we get new people, and people who read the newsletter who haven't seen or aren't referring back to our prior Resource Issues.

We look forward to seeing you there, and hearing about what sort of astronomy things you can point us toward!

M71, Arrowhead Nebula, by member John Rourke. SeeStar 50, 64 minutes.

Your Club Officers & Directors

President	Mark Graybill
Vice President	Ken Katta
Secretary	Randy Gilbert
Treasurer	Linda Meng
Space Academy	Toni Graybill
Public Relations	Jeffrey Kahler, Sr.
Directors	Craig Henry
	Burt Salk, Bob Averitt

Newsletter Contact: saundby@gmail.com

July Round Table Meeting Discussion

We had a great "Getting to Know You" roundtable meeting in July, where we discussed members' needs along with our interests.

We will be looking to improve the club's online community tools to allow for members with specific interests to find each other and discuss their specific interests within the broad hobby of astronomy. In particular, we had several members say that they would like to find more members to exchange information on astrophotography and image processing, and to organize citizen science efforts. These are both endeavours that are central to the club's mission, so we will be upgrading our website to add discussion forums over the next few months.

While we currently have a Facebook group, social media sites tend to hide anything that is not very recent, and we need a place where valuable information and contact people are not lost in a continuous wash of unrelated content--a search feature is not enough.

Citizen Science and Astrophotography are central to the mission of The Villages Astronomy Club. We will be adding online Forums as a way for our members to hold focused discussions on these and other subjects.

We also have our email list, but it is only used for a relatively small number of announcements from the club's officers. We don't want to flood everybody's inboxes with content that they aren't interested in.

So we will be setting up an online forum for our club tied to our website. It will be similar to Talk of The Villages from a technical standpoint, but of course it will be run by our friendly club members and we'll be discussing astronomy rather than all the topics at ToTV.

Membership will be open to non-Villagers, as with all our electronic sites, but the focus will be on The Villages and residents. But we can include nearby people such as our friends in Fruitland Park, Summerfield, and perhaps even the Moonstruck Club in Top of the World in our online conversations to find common interests and projects to share with others nearby.

See Calendar at End of Newsletter, before star chart.

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

Launch of rocket Bumper 8 at Cape Canaveral , July 24th, 1950. NASA/US Army photo.

Cape Canaveral Celebrates 75th Anniversary of Space Launches

The first launch of a rocket from Cape Canaveral occurred 75 years ago on July 24th, 1950, when General Electric launched Bumper 8. The Bumper program was created by U.S. Army Colonel Holger N. Toftoy to expand the U.S. capability in long range and high altitude rocketry. Responsibility for the program was assined to General Electric and CalTech's Jet Propulsion Laboratory with special component design performed by the Douglas Aircraft Company. No German engineers were directly involved in the program, it was staffed by U.S. personnel.

After problems with V-2 rockets going outside the test range at White Sands Proving Grounds in New Mexico, the land of the Naval Air Station Banana River was transferred to the new U.S. Air Force for use as a missile launch site. Named the Joint Long Range Proving Ground in 1949, it was chosen as the site for the final two Bumper program launches, which would be seeking to set new records in both altitude and range of missile flight.

Six of the eight Bumper flights were conducted at White Sands, and the final two at the Long Range Proving Ground. Bumper 8 was launched first on July 24th, and Bumper 7 was launched 5 days later on July 29th, marking the first launches from the new missile launch base. (The order of flights ended up reversed due to hardware readiness for the flights.)

The Bumper 8 Rocket is Prepared for Launch. Cape Canaveral, July 1950. The V-2 at right is being prepared to receive the WAC Corporal rocket on the cart at left. NOAA image.

Bumper Rocket

The Bumper program was charged with developing techniques for getting greater range and altitude from rockets using "step rockets", what today we call staging. It joined V-2s that had been captured during WWII with the proven U.S. WAC-Corporal rocket as a second stage.

While the program was publicly known, elements of the program were secret at the time, specifically the way the two rockets were connected together, how the second stage was fired and launched, and details of the guidance and control system.

The rocket, to be known as RTV-G-4 Bumper, was a combination of the German V-2s, which were mostly assembled from captured components of the rockets, with some parts of new manufacture in the U.S. The "RTV" designation stands for "Rocket Test Vehicle". The "G" signifies that the rocket was developed by

General Electric, which had overall responsibility for the Hermes project of which Bumper was a part. “4” signified that this was General Electric’s 4th rocket test vehicle developed. The name “Bumper” came from the purpose of the program, which was to bump, or advance, U.S. rocket technology to a new level.

The WAC Corporal rocket was selected as the second stage for Bumper because of its light weight and high reliability. As a liquid-fueled rocket, its mass could be reduced for early flights testing the structural integrity of the vehicle by reducing its propellant load.

The solid rocket booster element of the WAC Corporal was dispensed with.

GE and Douglas developed the technique for attaching the WAC Corporal to the V-2 in a way that would both hold it securely against the mechanical and aerodynamic forces of launch, while also allowing it to detach when desired when the WAC Corporal fired to begin its second stage flight.

The WAC Corporal used “hot staging”, that is, its rocket engine was fired before the V-2’s rocket burned out. This was done to make sure that the WAC Corporal was launching from a stable platform with active guidance. The V-2 was guided by deflecting its rocket exhaust using vanes in the plume of the rocket, so it was only fully stable while its rocket was firing.

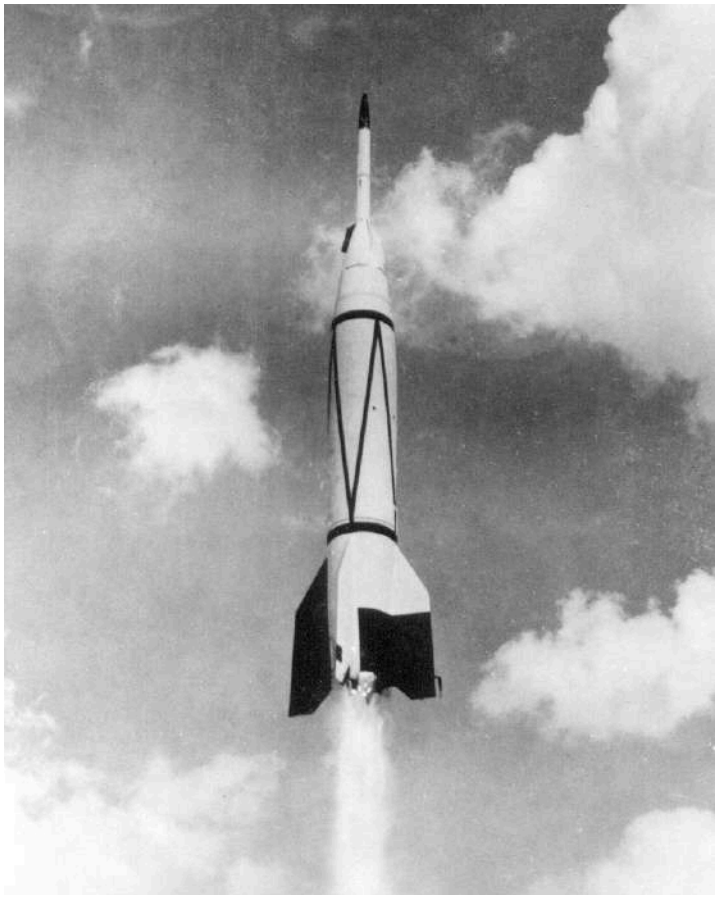
White Sands Flights

Bumper 1, the first flight from White Sands on May 13th, 1948, was the first flight of a two stage rocket. Its second stage was only partially fueled to limit its range and stresses on the connection between the two rocket stages.

Bumper 5 in February 1949 was the first successful flight with a fully fueled second stage. Bumper 2 through 4 all experienced problems with either the V-2 or the WAC Corporal that prevented them from completing their tests.

Bumper 5 achieved an altitude of 250 miles, the greatest altitude ever achieved by a rocket at the time. The first stage fell 20 miles north of the launch site about 5 minutes after launch.

The second stage struck the ground about 80 miles away from the launch site, and struck at such a high velocity, higher than any other rocket so far, that it was almost a year before its wreck was not found for analysis until 11 months later.



Bumper 5 Flies From White Sands N.M., Feb 24, 1949 NASA/US Army Photo.

Move to the Cape

Because of space limitations at White Sands, the six flights there were limited to high angles of launch, so that returning parts would fall within the safe area of the Proving Grounds. But to demonstrate the range increases that staged rockets provided, the Bumper Program held its final two launches at the new Long Range Proving Ground at Cape Canaveral in Florida.

There, they could launch at lower angles to obtain greater distance of travel across the Earth’s surface. The range included offshore sea

area for the rockets to fall to Earth safely through the use of NOTAMs (Notices To Airmen and Mariners) about the hazards when flights occurred.

Bumper 7 was prepared for launch in June 1950, but then experienced the first pad abort of any rocket launch. As a result it was removed from the launch stand for corrective work, and Bumper 8 was prepared for launch the following month.

Bumper 8 in its gantry during launch preparations in July 1950. Note the "B8" designation on its fins. NASA photo.

Bumper vehicles 7 and 8 were modified with thermal protection materials applied to the nose cone and body of the WAC Corporal to protect it from the heating effects of high speed flight through the atmosphere due to the low angles of flight used to get maximum range for the rocket. Its nose cone was coated in Teflon, and its body in Perlite, to protect them from heat.

Bumper 8 was intended to fly at an angle of 22 degrees above the horizon, but after launch a guidance failure caused the V2 to fly at about half that angle, placing far greater heating and stress on the rocket than had been planned.

The tracking ship *Sarsfield* observed the flight, and saw the WAC Corporal fail to fire when it detached from the V-2. Regardless, it reached a range of 200 miles, a record for range at the time. All the Cape's control and tracking systems worked well and had now been demonstrated with an actual flight. Publicly, the flight was declared a complete success.

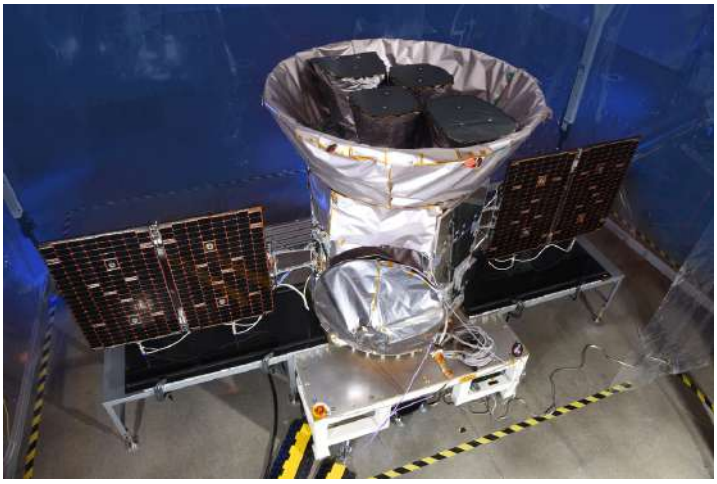
Five days later, Bumper 7 was launched from the same location (Pad 3). The V-2's rocket lost thrust at only 8.5 miles altitude, rather than the intended 20-22 miles, and 16 miles downrange. Per programming, the WAC Corporal fired its rocket, successfully staging and reaching a range of over 200 miles, despite only reaching about half the intended velocity and altitude.

Bumper was declared a success, in large part more because of proving out the launch facilities and support operations at Cape Canaveral than because of the actual flight performance of the experimental, and still highly secret, missiles (the WAC Corporal had not even been fired atop its solid rocket booster designed for the purpose, yet!)

Learn more at:

[75 Years Ago: First Launch of a Two-Stage Rocket - NASA]

[Space Florida Celebrates the 70th Anniversary of the Bumper 8 Launch Florida's Cape Canaveral Spaceport Remains a Global Leader]



The Transiting Exoplanet Survey Satellite prior to launch in 2018. NASA image.

Some Exoplanets May Be Larger Than Originally Thought

Planets found by the Transiting Exoplanet Survey Satellite (TESS) in the Earth size range may actually be larger than initial calculations made them out to be, according to a new paper published by Te Han and collaborators on June 14th, 2025.

Since the size of the planets cannot be determined by direct observation--the angular resolution of our space telescopes is far too low to do that--their size is estimated using the fraction of starlight blocked when the planets are in front of their host star. While most of the large space telescopes that have been used for exoplanet detection have a very high angular resolution, which can be used to exclude light from other sources near the star, the relatively small TESS telescope has a low angular resolution. This means that a calculation of the light changes caused by orbiting planets has to be corrected using a mathematical technique known as the TGLC, the Tess-Gaia Light Curve, developed to correct size estimate with low angular resolution instruments.

Te Han and collaborators have called into question the TGLC, particularly for smaller planet sizes in the Earth-sized range, a size of planet that was of particular interest for the TESS mission. Overall, they found that planet sizes were likely underestimated by about 6%, with planets in the Earth and sub-Neptune size often being larger than estimated, elevating Earth sized finds to the next larger size category.

They reviewed over 200 planets in the TESS catalog that had independent measurements performed by other space telescopes using data in the Mikulski Archive for Space Telescopes (MAST.)

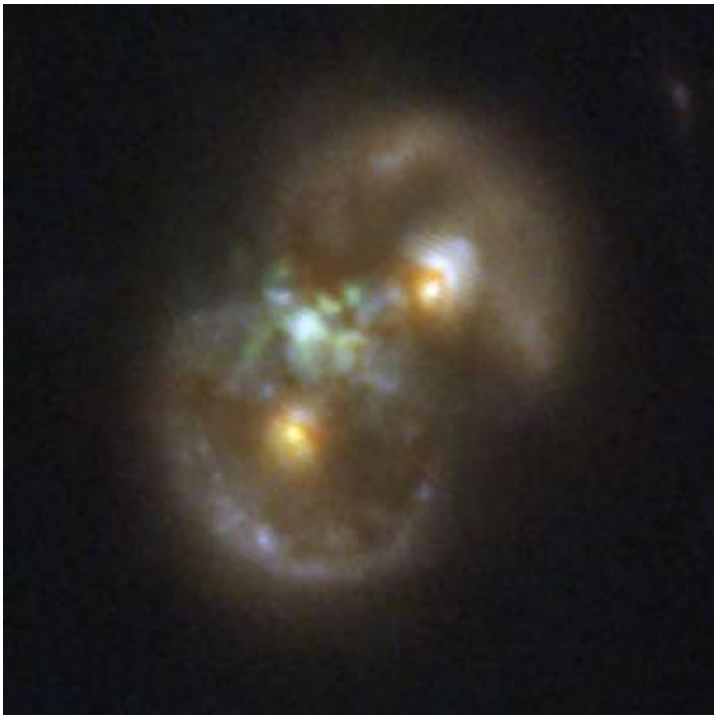
LP 791-18d, shown here in an artist's rendition, is an exoplanet discovered by TESS that was posited to be an Earth-sized world. New data shows that it may, in fact, be either a super-Earth or sub-Neptunian sized planet. NASA image.

Original paper by Te Han et al:
Hundreds of TESS exoplanets might be larger than we thought

Sky & Telescope Article:
Some Planets Are Bigger Than We Thought - Sky & Telescope

Mikulski Archive for Space Telescopes (MAST)
Papers defining the TGLC algorithm:
TGLC | MAST

MAST Home Page (check it out!):
Mikulski Archive for Space Telescopes



The Infinity Galaxy, a pair of interacting spiral galaxies imaged by JWST. The yellow areas are the galaxys' nuclei, the green area is ionized hydrogen around an unusual black hole.

JWST Spots Possible Direct Collapse Black Hole in Beautiful Galaxy Collision

Researchers reviewing data from the James Webb Space Telescope discovered an unusual galactic structure of two interacting spiral galaxies. The two galactic nuclei are surrounded by ring structures of the galactic halos, forming a shape that looks like an analemma, the mathematical symbol for infinity.

Further observations revealed that there is a supermassive black hole that is not inside the nuclei of the galaxies. Normally, supermassive black holes are found in galactic nuclei, like first black hole that was imaged directly at the heart of the nucleus of galaxy M87.

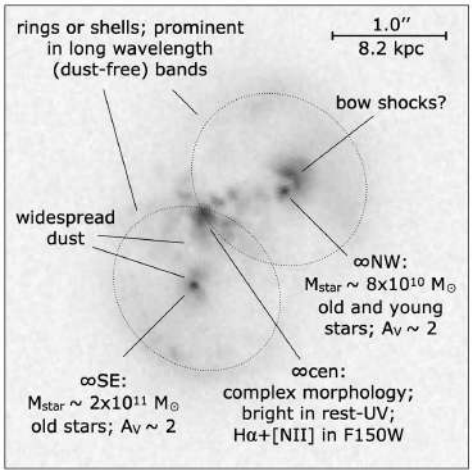
This black hole is located in the green area in the image above, far from either nucleus. Currently, there are two processes known by which black holes can form. The first is by the collapse of the core of a massive star. These black holes can then grow to be up to ~1000 times the mass of the Sun. These are known as "light seeds", because while they can grow larger, they cannot grow fast enough to become supermassive black holes such as are seen at the centers of galaxies, or this black hole which appears to have a mass of about one billion Suns.

The second way that a black hole can form is by the direct collapse of millions of solar masses of gas clouds into a black hole. These are called "heavy seeds" and are believed to be the cause of early galaxy formation in the universe. But in this case, JWST may be observing more recent conditions under which a black hole formed by direct collapse, when massive gas clouds in two galaxies came together as a result of a galactic collision, forming a new supermassive black hole.

Alternative explanations could be that the black hole could have been ejected from another galaxy, or that it was part of a third galaxy involved in the collision. However, follow-up observations showed that its velocity puts it exactly in the middle of the velocities of the two colliding galaxies, suggesting that it formed in place rather than was an independent body involved in the galactic collision.

NASA Science Blog Article:
[NASA's Webb Finds Possible 'Direct Collapse' Black Hole]

Original Paper by Pieter van Dokkum et al.
[2506.15618] The Infinity Galaxy: a Candidate Direct-Collapse Supermassive Black Hole Between Two Massive, Ringed Nuclei



IN THE SKY THIS MONTH

Also refer to the sky map on the last page.

THE MOON

1st Quarter, August 1st
Full Moon, August 9th
Last Quarter, August 16th
New Moon, August 23rd
1st Quarter, August 31st

John Keller's image of M27, the Dumbbell Nebula, taken with a Seestar 50 in equatorial mode.

To date, summer 2025 has had far more clear nights for observing than 2024, but August is still a challenging month with frequent thunderstorms in the afteroon and evening, and cloud cover for over half the month's evenings in an average year.

However, August usually provides 8-10 nights clear enough for observing. So you just need to be ready when they come! You can be sure that most will happen when you've got other commitments that you can't possibly avoid.

Mercury starts the month too close to the Sun for easy observation. It moves further away as the month progresses, and higher in the sky. On August 21st, it is at maximum elongation (distance from the Sun), being 17 degrees above the horizon at sunrise. It shines brightly at magnitude -0.2. It will be best caught in the half hour immediately before sunrise from August 14th to August 28th. It can be seen by eye, but binoculars will show it as a reddish orange spot. Low to mid power telescope views will show it as a colored disk.

Mercury online viewing chart:
https://in-the-sky.org//data/object.php?id=P1

Venus shines as a bright morning star, at magnitude -4.0. Rising around 3:30am, it's high in the eastern sky before dawn, making it stand out in Taurus. On August 12th, Venus has a conjunction with Jupiter, less than 1 degree apart, placing both within a telescope's single field of view at low to mid powers. Venus shows a gibbous phase when magnified at 50x or more, about 75% illuminated.

Venus online finder chart:
https://in-the-sky.org//data/object.php?id=P2

Mars is in Virgo this August, dimming to magnitude 1.6 as it moves farther from Earth. It rises around 7:45pm early in August, setting near midnight by month's end. On August 25th, Mars lies near the waxing crescent moon and Spica, forming a striking trio in the evening sky. A telescope at medium to high powers will show Mars as a disk, but features will be difficult to see because of its small angular size at its current distance.

Observing information for Mars:
https://in-the-sky.org//data/object.php?id=P4

Jupiter is a morning planet, rising around 4:45am in early August, magnitude -2.0 in Gemini. It climbs higher each morning, offering better views by month's end. Throughout August, Jupiter appears near Mars in the pre-dawn sky, with the two planets about 5–6 degrees apart in mid-month. Any telescope reveals Jupiter's cloud

bands and up to four Galilean moons, though low altitude may affect clarity.

Jupiter observing information:
https://in-the-sky.org//data/object.php?id=P5

Saturn remains an evening highlight, rising around 10:30pm in early August, and 9:30pm in late August. It shines in Aquarius, at magnitude 0.7. The rings, still tilted at a low angle, allow good views of the planet's cloud bands. Saturn is best observed at its highest altitude, around 1:00–1:30am. On August 12th, it lies near the nearly full Moon, making it easy to spot though details will tend to be washed out by the Moon's glare. Neptune will be 1-2 degrees from Saturn all month, so telescope at low powers can catch both in the same view, and allow Saturn to be used as a guidepost to find Nepture for higher power observation.

Saturn finder chart:
https://in-the-sky.org//data/object.php?id=P6

Bright Asteroids visible this month include **Ceres**, the largest asteroid, shining at magnitude 7.8 in Sagittarius. It's observable in the early evening, high in the southern sky around 10pm. A 60mm telescope under dark skies will show Ceres as a star-like point; use a star chart to locate it near the Teapot asterism.

Vesta, at magnitude 8.0–8.2, is also visible in Scorpius, moving toward Libra by month's end, best seen early in the month before it sinks lower. Both are within reach of a 60mm scope under good conditions, though binoculars may help locate them.

Ceres finder chart:
https://in-the-sky.org//data/object.php?id=A1

Vesta finder chart:
https://in-the-sky.org//data/object.php?id=A4

Globular Cluster M13 in Hercules. See finder chart, below.

Club Calendar

Special events by The Villages Astronomy Club
Events not hosted by The Villages Astronomy Club
Notable dates with no event planned.

August 2025
1 Exec Meeting, Fishhawk Rec Ctr, 11am
4 Space Academy 6:30pm, Telescope Workshop 8pm
16 Fruitland Park Observing, 5pm, 300 Shiloh St. Fruitland Park
19 General Meeting 6:30pm, Round Table: Resources
27 EAA Meeting Cancelled

September 2025
1 Space Academy, 6:30pm, Truman Rec Ctr, Observing Workshop 8pm
5 Exec Meeting, Fishhawk Rec Center, 11am
16 General Meeting, 6:30pm, Laurel Manor Rec Ctr
20 Fruitland Park Observing, 5pm, 300 Shiloh St. Fruitland Park
24 EAA Meeting, Homestead Rec Center, 7pm

October 2025
3 Exec Meeting, Fishhawk Rec Center, 11am
6 Space Academy, 6:30pm, Truman Rec Ctr, Observing Workshop/Binocular Workshop 7:30pm
18 Fruitland Park Observing, 5pm, 300 Shiloh St. Fruitland Park
21 General Meeting, 6:30pm, Laurel Manor Rec Ctr.
22 EAA Meeting, Homestead Rec Center, 6:15pm

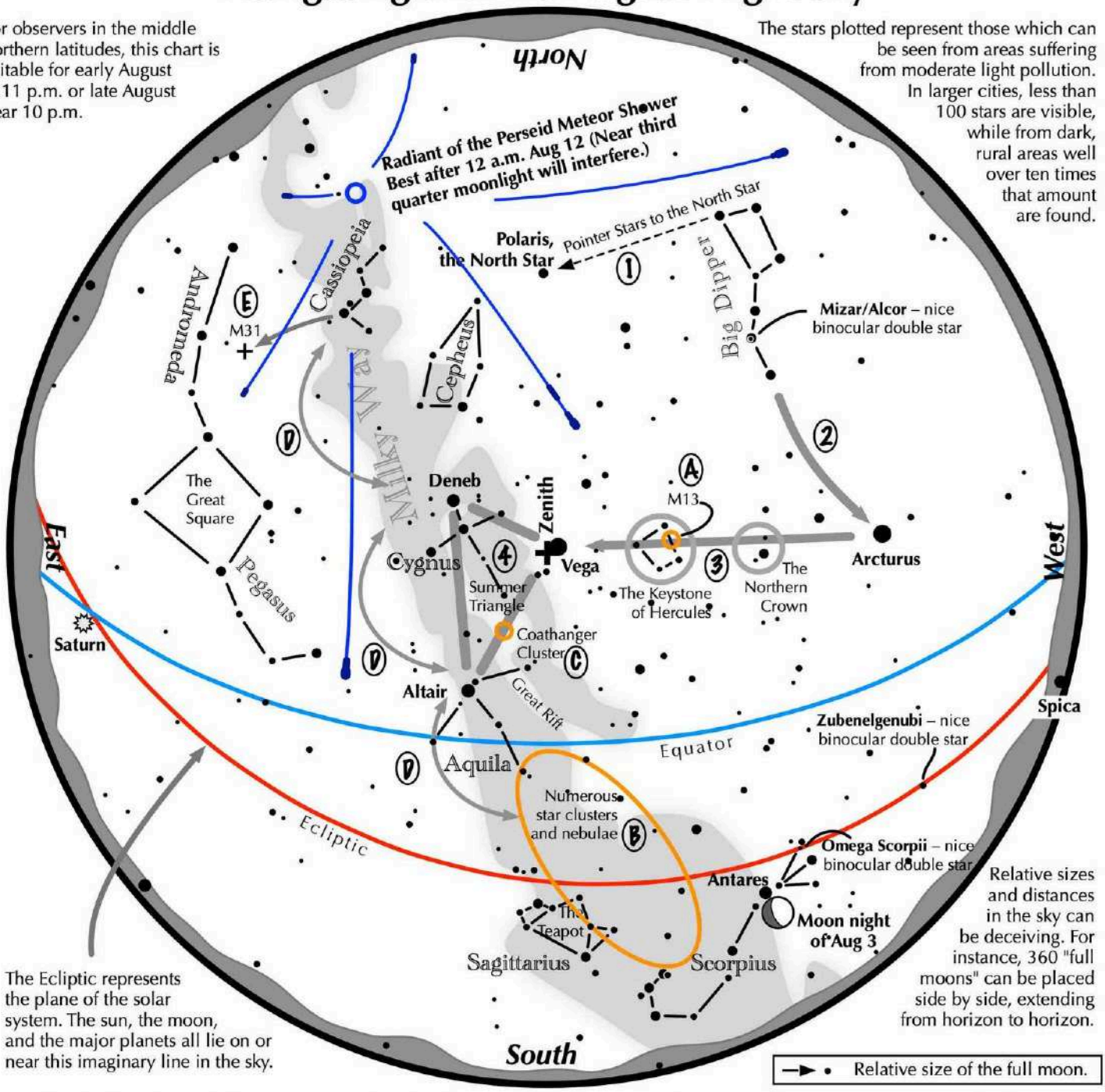
Club Calendar on the web:
https://vlgastroclub.org/calendar/

See star chart & special observing graphics on following pages:

Navigating the mid August Night Sky

For observers in the middle northern latitudes, this chart is suitable for early August at 11 p.m. or late August near 10 p.m.

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

→• Relative size of the full moon.

Navigating the mid August night sky: Simply start with what you know or with what you can easily find.

1. Extend a line north from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
2. Follow the arc of the Dipper's handle. It intersects Arcturus, the brightest star in the June evening sky.
3. To the northeast of Arcturus shines another star of the same brightness, Vega. Draw a line from Arcturus to Vega. It first meets "The Northern Crown," then the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.
4. High in the East lies the summer triangle stars of Vega, Altair, and Deneb.

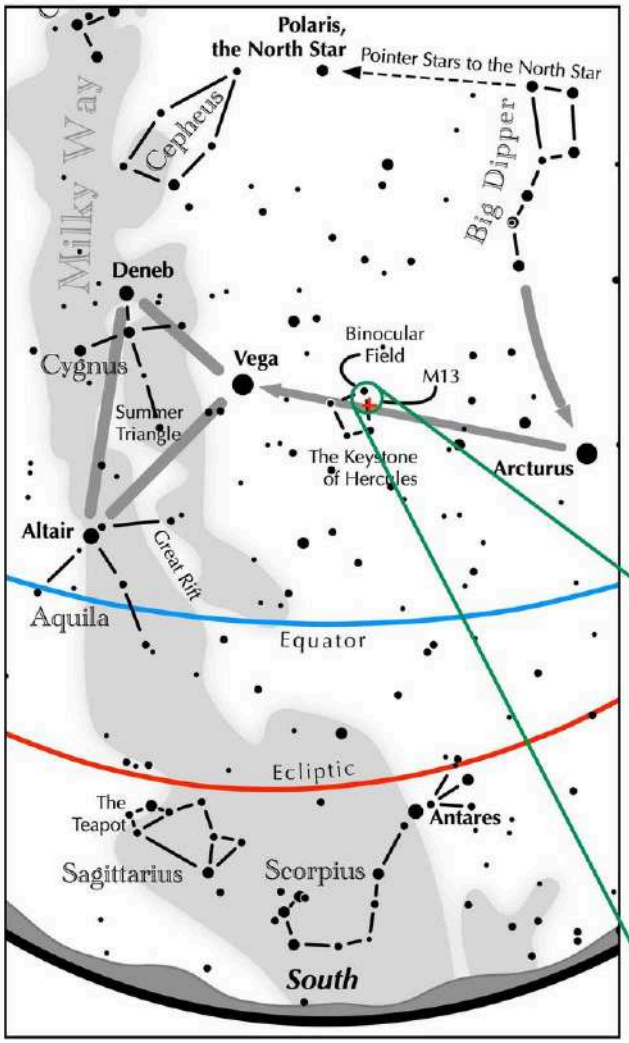
Binocular Highlights

A: On the western side of the Keystone glows the Great Hercules Cluster.
B: Between the bright stars Antares and Altair, hides an area containing many star clusters and nebulae.
C: 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger.
D: Sweep along the Milky Way for an astounding number of faint glows and dark bays, including the Great Rift.
E: The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval.

Visible in the early evening from late Spring through mid Autumn

M13:
A sight no amateur astronomer should miss.

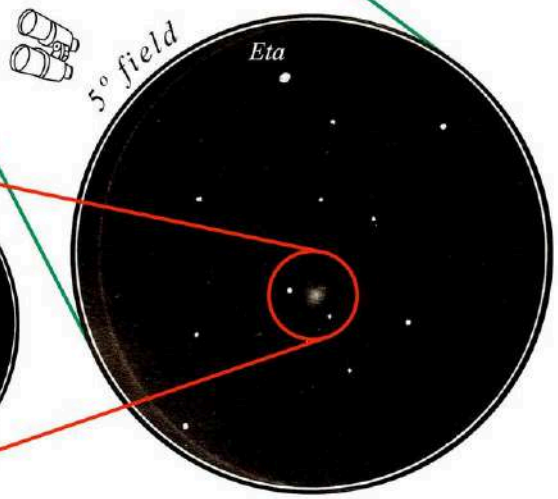
M13 is a *globular cluster*. It contains over 500,000 stars within a spherical volume 140 light-years in diameter and is over 22,000 light-years distant. Hence, in an amateur's telescope, it appears aa a fuzzy, round ball of starlight packed with individual faint points of light.



M13 is not hard to find.

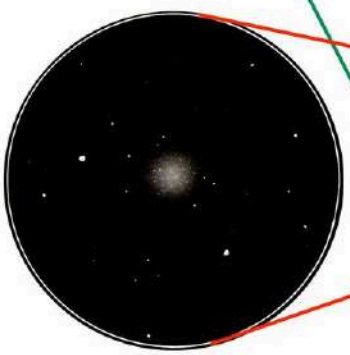
1. Locate Arcturus, the brightest star in the summer sky. Simply extend the curve of the Big Dipper's handle. It lands on Arcturus.
2. Further to the northeast is the second brightest star in the summer sky, Vega.
3. Draw a line from Arcturus to Vega.
4. 2/3 along that line lie four dim stars known as the *Keystone of Hercules*. Folks in a dark suburban site should just be able to spot them.
5. 1/3 of the way between the northwestern and southwestern stars of the *Keystone* hides M13. Aim binoculars at the northwestern star, Eta Herculis, then place it near the northern edge of the field. The globular cluster lies below the field's center.
6. Binoculars should pick M13 out as a faint, small, round smudge.

M13 is well worth the effort to find.
It is an amazing sight, even through a small telescope. The larger the scope, the more incredible the view!



Eyepiece Impression:
View through an 8 inch f/4 reflector giving a field of 1°.
• Many very faint stars at the edge of a glowing ball with a solidly bright center.

What do you see?



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