Volume 6, Number 5
May 2025

Club Website:
http://vlgastroclub.org/

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

UPCOMING EVENTS

Executive Directors' Meeting, May 2nd, 11am
Fishhawk Rec Center, 2318 Buttonwood Run

All members welcome to our monthly planning meeting. This month we'll be making preparations for May's Astronomy Day, and our summer program.

Astronomy Day, Saturday, May 3rd 12-3pm, Homestead Rec Center

Our annual daytime astronomy event where we present the Sun and a guided tour of our solar system will be held in the grass area east of the Rec Center building on May 3rd this year. If you've attended our prior eclipse events, this will be much the same, but the Moon will not be in front of the Sun this time!

We will have solar scopes giving a view of our Sun and its activity, and information at our booth on the Sun and how it works. We will have our Solar Walk set up with guides to give you a walking tour of our solar system with information about each of the planets and other features that make up our local region of space.

Join us as we celebrate our nearest star and its companions!

The Sun in Hydrogen Alpha Light, April 14th
By member Steve Maiaroto, testing his new ZWO AM5 mount in equatorial mode.

Space Academy, May 5th, 6:30pm
Truman Rec Ctr, 2705 Canal St.

Join us for Space Academy, where we have talks on the basics of astronomy and news about current research topics.

Observers' Workshop, May 5th, 8pm
Truman Rec Ctr Pavilion, 2705 Canal St.

Learn to use your binoculars or telescope to see the sky! Get advice and guidance from experienced astronomers. Learn how to show the sky to the public, take advantage of accessories and techniques to make your observing more fun and more effective.

Camp Geneva Star Party, May 14th, 7:30pm

Astronomers, come help us show the sky to students ranging from 4th to 11th grade. Contact Mark Graybill if you would like to help!

Fruitland Park Astronomy Group, May 17th, 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 group of friendly astronomers!

Solar Observing at Fruitland Park Astronomical Group Monthly Meeting. Dave Scruggs, President of FPAG with SeeStar S50, Toni Graybill with Coronado II H-alpha Scope.

General Meeting, May 20th, 6:30pm: Seeking The Theory of Everything by Pauline Schwartz, Ph/D.

Humans are an exceedingly curious species and since ancient times have sought to understand the nature of our world. Atoms were thought to be the indivisible pieces of everything. As science evolved, we asked about the nature of atoms. We devised a Periodic Table of Elements describing all matter as we knew it. We sought consistent theories in physics and chemistry to explain the nature of atoms, energy, and fundamental forces. Classical models gave way to the quantum model of the atom described by the theories of quantum mechanics. This was okay until further science found evidence of constituents beyond electrons, protons,
and neutrons. A more comprehensive model of matter is the Standard Model of Particle Physics. The theory underlying this most comprehensive model of matter is quantum field theory. But, questions remain. What about gravity and relativity? What about dark matter and dark energy? In astronomy and cosmology, how can we understand the moment of the Big Bang and the presence of black holes, which are small regions of space with extremely large masses; in these circumstances, how can we merge the currently incompatible ideas of quantum science and general relativity. I hope to present a big picture of efforts to answer these questions as we seek a theory of everything.

EAA Meeting, May 28th, Homestead Astronomy Park, 7:45 pm

Join us at Homestead Astronomy Park for an evening of observing with smart telescopes! Owners of smart scopes or scopes with smart controllers are welcome as are those who are interested in learning more about Electronically Assisted Astronomy (EAA).

Additional Calendar Items Listed at End of Newsletter, before star chart.
Club Calendar Online:
https://vlgastroclub.org/calendar/

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.

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

NEWS

Webb Sees Planetary Nebula Forming

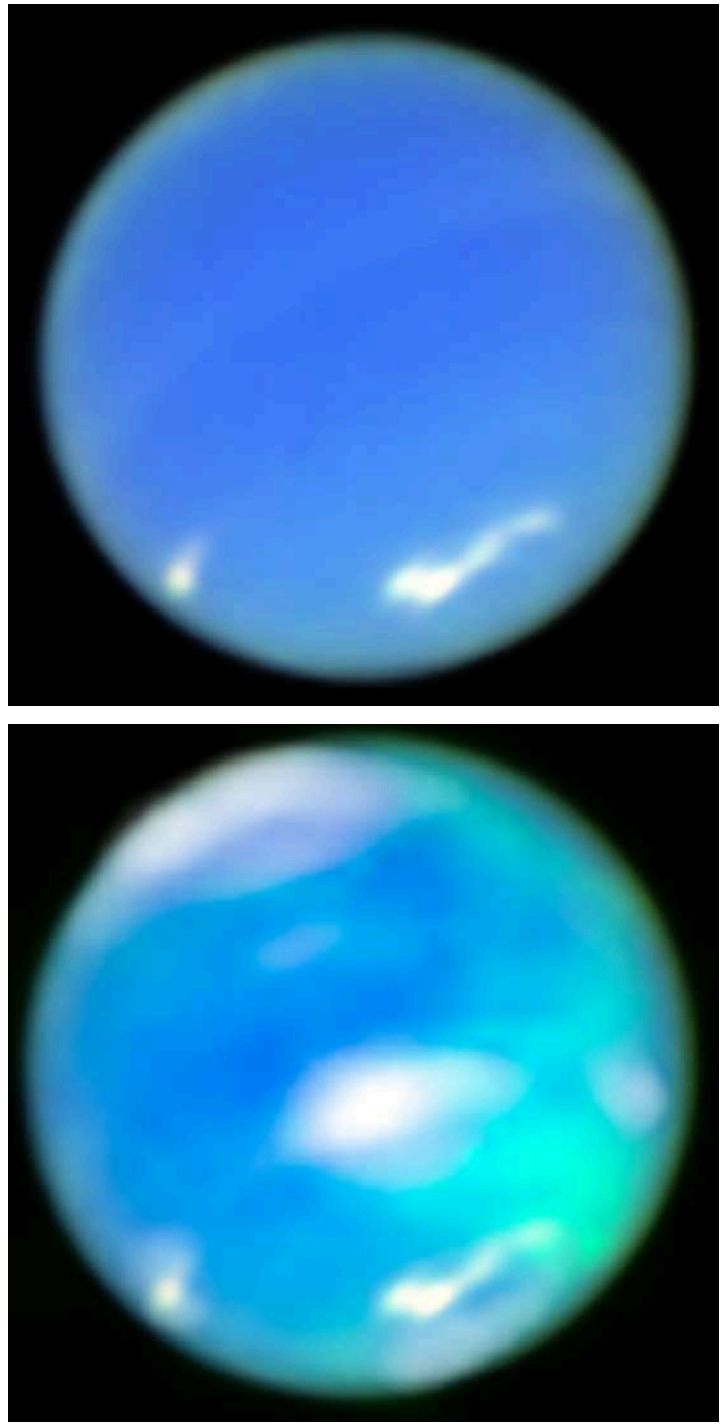
NGC 1514 viewed in mid-IR frequencies shows a star's atmosphere being cast off into a complex hourglass formation. NASA image.

NGC 1514 is a cloud of dust and gas being released in the solar wind of a dying star. The star, seen at the center of the above image with diffraction spikes, is slightly larger than our Sun and is in the process of shifting from its Red Giant phase of life to being a White Dwarf. This means the core is collapsing due to the cessation of nuclear fusion, and the atmosphere of the star is being wafted off into the space around it.

Unseen in this image is a companion star, which is helping shape the gas into this hourglass form (seen at about a 30 degree angle.) The companion is so close to the main star that it can't be seen. The stars orbit each other over 9 years.

Many planetary nebulas take dramatic forms due to secondary stars orbiting the main star, or due to the magnetic field of the main star as it collapses. Planetary nebulas are so called because hey have many of the visual attributes of planets in small telescopes--many look like disks with varying brightness, named by William Herschel, discoverer of planet Uranus.

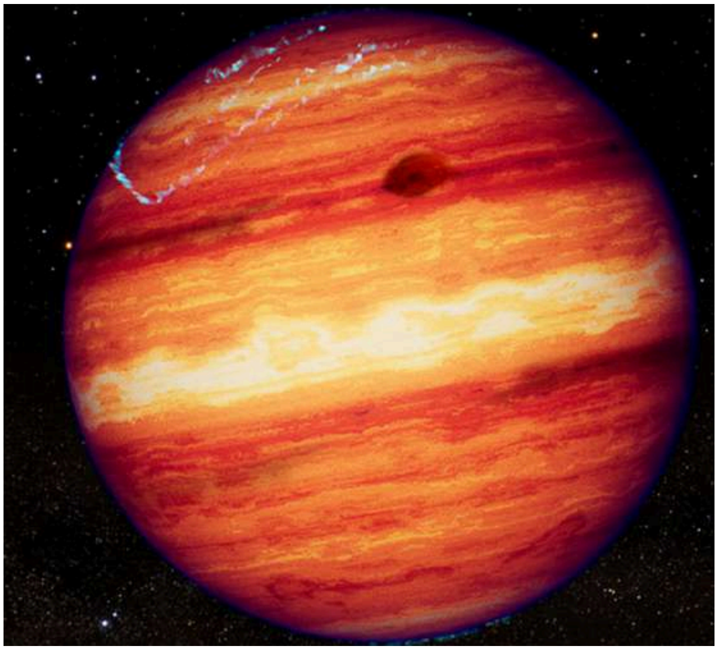
Auroras Seen on Neptune



Images of Auroras on Planet Neptune. NASA

Earth is not the only planet that has had lots of auroras caused by our Sun's very active Solar Maximum this year! While auroras have been seen on Jupiter and Saturn before, this is the first time that auroras have been seen on Neptune. Long suspected, it took the James Webb Space Telescope to capture live images of Neptune's auroras.

Rogue Planet 20 Light Years Away



Artist's Concept of SIMP 0136, a starless super-Jupiter 20 light years from Earth. NASA

A rogue planet, that is, a planet moving through out galaxy without orbiting a star, has been seen to have a complex atmosphere and active chemistry when observed by the James Webb Space Telescope. Though the planet is floating freely through space, it is not frozen and inactive. It has a layered atmosphere with active carbon chemical processes.

About 13 times larger than Jupiter, the planet bounds the line between a super-Jupiter and a Brown Dwarf (a large planetary body that doesn't have enough mass for nuclear fusion.) A multitude of observations at different infrared wavelengths revealed hot spots and atmospheric circulation patterns that reveal a complex world.

SIMP 0136 is the brightest object of its sort known, making it the best target for these studies.

The observations provide information that will be used to study other exoplanets in the future.

Learn more:
[NASA's Webb Exposes Complex Atmosphere of Starless Super-Jupiter]

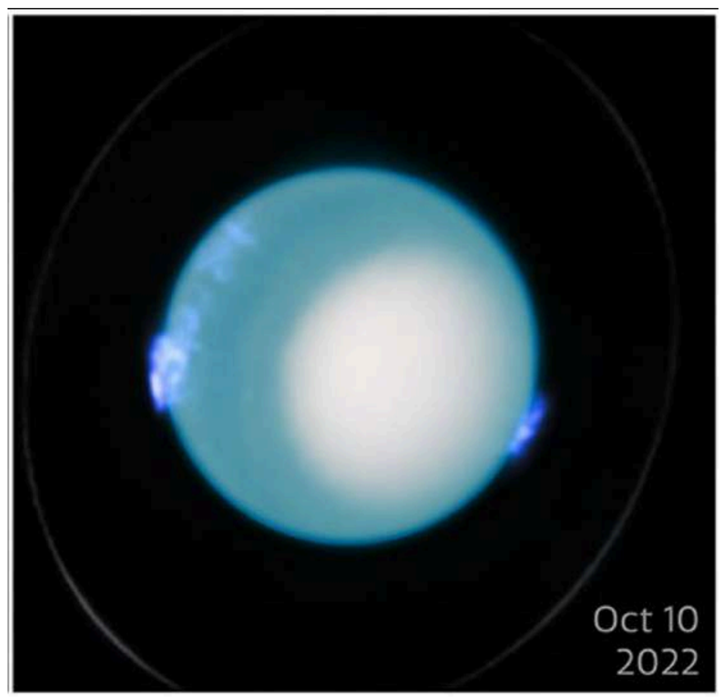
China Launches New Crew to Tiangong

Long March 2F/G Rolls Out to Launch Site. CCTV image

China is slated to launch its 15th crew mission to space on April 24th, destined to be the 9th crew about China's Tiangong (Heavenly Palace) space station.

They will be replacing the current crew, who have served a 6 month mission. After a handover ceremony, the prior crew will return to Earth in their capsule. To date, China has launched 24 Taikonauts into orbit as part of their rapid advancement into spaceflight.

Auroras Reveal Uranus' Rotation Rate



Hubble Spectroscopic Imager Shows Auroras on Uranus. Images over multiple years have allowed scientists to determine Uranus' rotation rate.

A team of scientists has used Hubble images of Uranus' auroras to determine the rotation rate of the planet 1000 times more accurately than ever before. Determining the rotation of a planet's core beneath dense layers of atmosphere is very difficult. Using the movement of the auroras allowed the team to track the movement of the magnetic poles of the planet.

It had become obvious that the timing derived from Voyager 2's flyby in 1986 wasn't quite accurate as anomalies were found in predictions of the movement of the planet's poles and atmosphere, as well as effects on its moons.

It is now known that the exact duration of a rotation on Uranus is 17 hours, 14 minutes, and 52 seconds. This does not equate to a "day" on the planet, however, as its 97.8 degree tilt relative to the Sun means that a "day" lasts roughly half its 84 year orbit.

Rapid Progress on Starship in Florida

Construction of foundations for the "Gigabay" manufacturing facility for SpaceX's Starship is under way on Roberts Road near Cape Kennedy. GeoSat image.

Excavation for a new LC-39A flame trench begins. Airbus image via @Harry__Stranger on X.com.

SpaceX is rapidly working toward its first Starship launch in Florida. Work has resumed on the modifications to Launch Complex 39A, former Apollo and Space Shuttle launch site, and current launch site for Falcon 9 and Falcon Heavy. While the historical launch tower and flame trench are in use for Falcon launches, a new tower has been built for Starship to one side of the existing launch pad. Erected, then left inactive for over a year, work has now started in earnest to prepare it for launch next year.

With over 100 workers on site, the tower itself is being prepared, and excavation for a new flame trench for Starship has begun. Barriers for the sides of the trench have been placed, preparatory to excavation, dewatering, placement of rebar, and concrete pours. While the timing of current work in Florida is running about 6 months later than timing on the similar second launch complex in Texas, work is moving more rapidly, likely because of lessons learned in Texas.

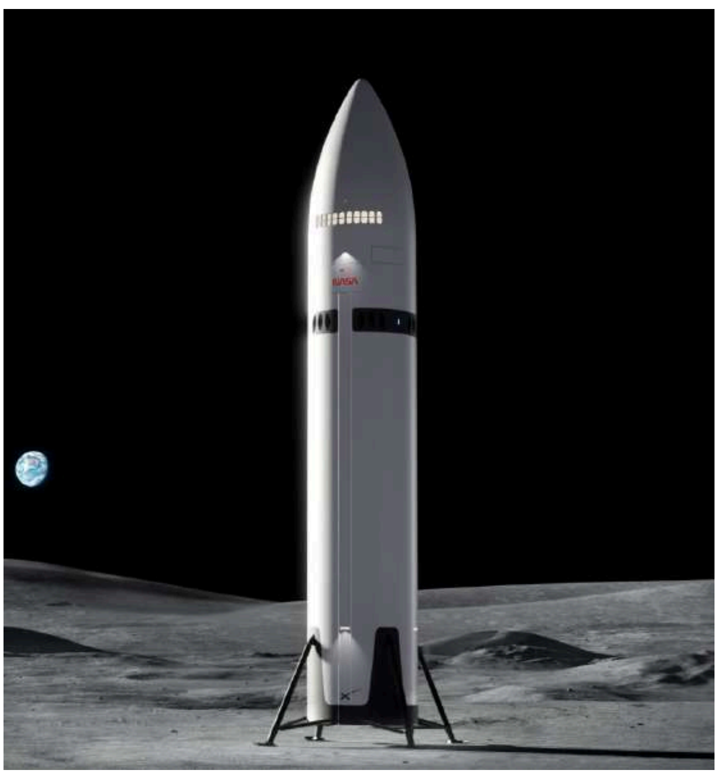
A new launch pad has also been seen under construction at SpaceX's Roberts Road facility in Florida, just outside Kennedy Space Center. The parts of the massive steel stand match those seen for Pad 2 in Texas as well.

An immense factory for manufacturing Starships in Florida is also getting its foundations laid, as reported in last month's newsletter. While the first Starships launched from Florida are expected to be built in Texas and moved via barge to Florida, Florida will soon have its own factory capable of producing Starships and Superheavy Boosters by the dozen.

Reported targets for Florida are to have a Starship stacked on the launch pad for testing by the end of 2025, with first launch in 2026. SpaceX's Starship is NASA's Human Landing System for Artemis III and IV, and will launch from LC-39A. The HLS Starship will be a special version for the lunar mission, with no heatshield and with landing legs since there will be no tower on the Moon to catch it (yet.)

The Florida launch complex is also expected to support the high launch rate that will be required for Starship's Mars flights in late 2026, which will require the use of all 3 Starship launch pads to send dozens of refueling flights to the Starships bound for Mars while they are in Earth orbit.

The 2026 Mars flights will test the ability of Starship to land on Mars, and will carry robots and propellant production plants to test on Mars.



Starship Human Landing System on the Moon SpaceX image.

IN THE SKY THIS MONTH

Also refer to the sky map on the last page.

The Moon:

1st Quarter, May 4th
Full Moon, Mayl 12th
Last Quarter, May 20th
New Moon, May 26th
1st Quarter, June 2nd

The Eta Aquarid Meteor Shower spans April 20th to May 21st this year, peaking on May 5th-6th. Any time during this period is a good time to view the meteors, especially nights with no Moon. The radiant point for the shower rises about 2:30am, meaning that it is best viewed in the early morning hours. The Eta Aquarids are very brief transient meteors that move rapidly. By the time someone hears you gasp when you see one, it'll already be gone.

The radiant point for the shower starts near Beta Aquarii (Sadalsud) in April, migrates past Alpha Aquarii (Sadalmelik), then through the main part of Aquarius to be a bit east of Eta Aquarid at peak on May 5-6th. After that, it slowly migrates toward Pisces until it ends.

The Eta Aquarid meteors are dust from Halley's Comet.

Mercury rises briefly before the Sun for most of May, disappearing into its glare at month end to reappear in the evening sky in June with a conjunction with Jupiter on June 8th.

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

Venus is a morning star this month, shining bright at magnitude -4.6. A telescope will show its phase a just over half illuminated at mid month.

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

Saturn starts the month in close proximity to Mercury and Venus, then moves out on its own as it rises earlier and earlier. Shining at magnitude

1.1, and 16.4 arcsec in diameter, it is large enough to show a good disk, especially alongside the still-thin rings with little ring shadow on the planet's cloudtops.

It and Venus start the month near **Neptune**, which requires a telescope or binoculars to see. Start with binoculars, look for a blue or blue-green "star." Use magnification of 70x or more to see it as a disk.

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

Venus, Saturn, and Neptune on May 1st, 5:40 am. Image via Stellarium.

Asteroid Vesta is at opposition on May 2nd. At magnitude 5.7, it is visible in binoculars, though too dim for visible observation in the sky conditions in The Villages. In the constellation Libra, near its boundary with Virgo, it is visible through the month. It was once a small planet, shattered by a collision long ago.

Observing chart and guide: [Asteroid Vesta Now an Easy Catch in Binoculars - Sky & Telescope]()

Binocular Highlight

Mars starts the month in Cancer, high in our evening sky. On the 3rd it and the Moon will be within 2 degrees of each other and near **M44, The Beehive Cluster**. On the 4th, Mars will be about half a degree from the center of the Beehive Cluster! Both nights are excellent opportunities to see the Beehive guided by the presence of Mars! Mars will remain near the Beehive for the next few nights, and will continue to guide you to the nearby Beehive until the 10th or so.

At the end of the month Mars will move into Leo, near the bright star Regulus (the Heart of the Lion.)

To see what features are visible at any time, you can use the virtual Mars globe at: [MarsMap]()

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

Mars, the Moon, and the Beehive Cluster on May 3rd. Mars will move at a 10 o'clock angleright to left in this image from night to night. Stellarium image.

Jupiter is in the west in the evening sky, and will be best observed at the start of the month before it gets too low in the sky to see well without atmospheric obscuration. It shines at magnitude

-2, and at 33 arcsec across it will show impressive detail in its clouds for any instrument of 50x or higher. By month's end, though, it will start to be too low to see before twilight becomes dark enough to make out details.

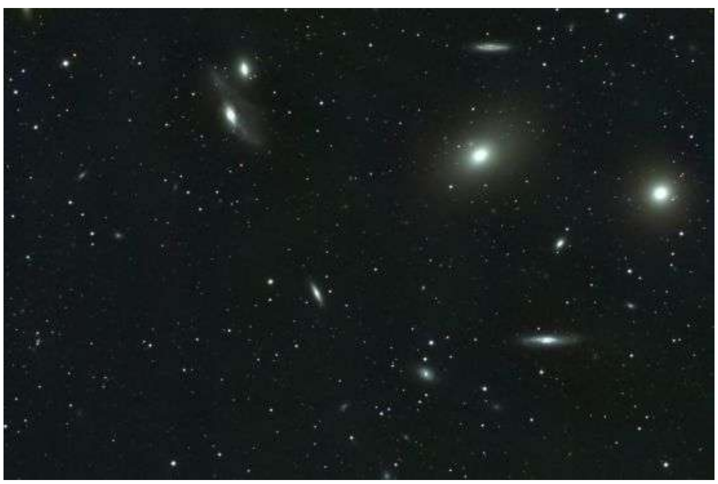
Jupiter observing information: https://in-the-sky.org//data/object.php?id=P5

Astronomical League Jupiter Observing Program: [Jupiter Observing Program - Astronomical League]

Astronomical League Solar System Observing Program: [Solar System Observing Program - Astronomical League]

Deep Sky This Month

We are firmly in galaxy season with Leo, Coma Berenices, and Virgo high in the sky. Views through binoculars or telescopes on clear nights will give multiple galaxies seen in a single view.



The Virgo Cluster of Galaxies. Finder chart below. Many galaxies visible in this area.

Finder Chart for the Coma Cluster.

The Coma Cluster of Galaxies

The Virgo and Coma clusters each contain multiple galaxies in the Messier catalog, that are viewable in small telescopes and binoculars. Messier 88 is on the border between the two clusters.

Leo and Ursa Major also contain bright galaxies in the Messier list. Add Canes Venatici (the Hunting Dogs, a constellation under the curve of the Big Dipper's handle), and you've got 30 galaxies to see! That alone is over half of the objects necessary to get the AL Messier award!

Recommended AL Observing Programs:

[Binocular Messier Observing Program - Astronomical League]

[Messier Observing Program - Astronomical League]

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

Monkey Head Nebula in Orion by member Craig Henry. 4.5 hours of data, carefully processed!

Club Calendar

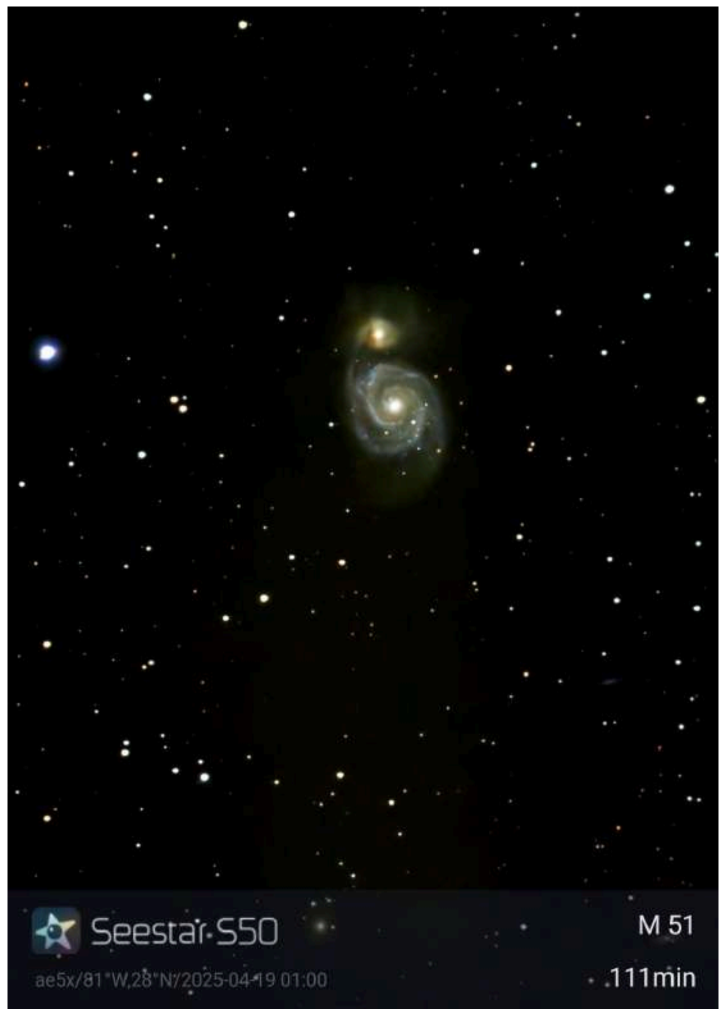
Special events by The Villages Astronomy Club
Events not hosted by The Villages Astronomy Club
Notable dates with no event planned.

May 2025
2 Exec Meeting 11am Fishhawk Rec Center
3 Astronomy Day, Homestead Rec Center, 12-3pm.
5 Space Academy 6:30pm, Telescope Workshop 8pm
6 Saturn Equinox
17 Fruitland Park Observing, 5pm, 300 Shiloh St. Fruitland Park
20 General Meeting 6:30pm, Pauline Schwartz, "Seeking the Theory of Everything"
28 EAA Meeting, Homestead Astronomy Park, 7:45pm

June 2025
2 Space Academy 6:30pm, Observers' Workshop 8pm
6 Exec Meeting 11am Fishhawk Rec Center
17 General Meeting 6:30pm, Anne Holland, NASA Ambassador, "Comets, Asteroids, and Meteors", Laurel Manor 6:30pm
19 Leesburg Library Telescope Check Out Program Kick-off: "Telescopes and Astronomy", Leesburg Library, 4pm
21 Fruitland Park Observing, 5pm, 300 Shiloh St. Fruitland Park
25 CAMP VILLAGES 10am, Homestead Rec Center
25 EAA Meeting, Homestead Astronomy Park, 8pm

July 2025
4 Exec Meeting: Drafting Additional Backup Officers at Round Table Meetings?
7 Space Academy 6:30pm, Telescope Workshop 8pm
15 General Meeting, 6:30pm, Round Table
19 Fruitland Park Observing, 5pm, 300 Shiloh St. Fruitland Park
23 CAMP VILLAGES 10am, Homestead Rec Center
24 EAA Meeting, Homestead Astronomy Park, 7:45pm

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



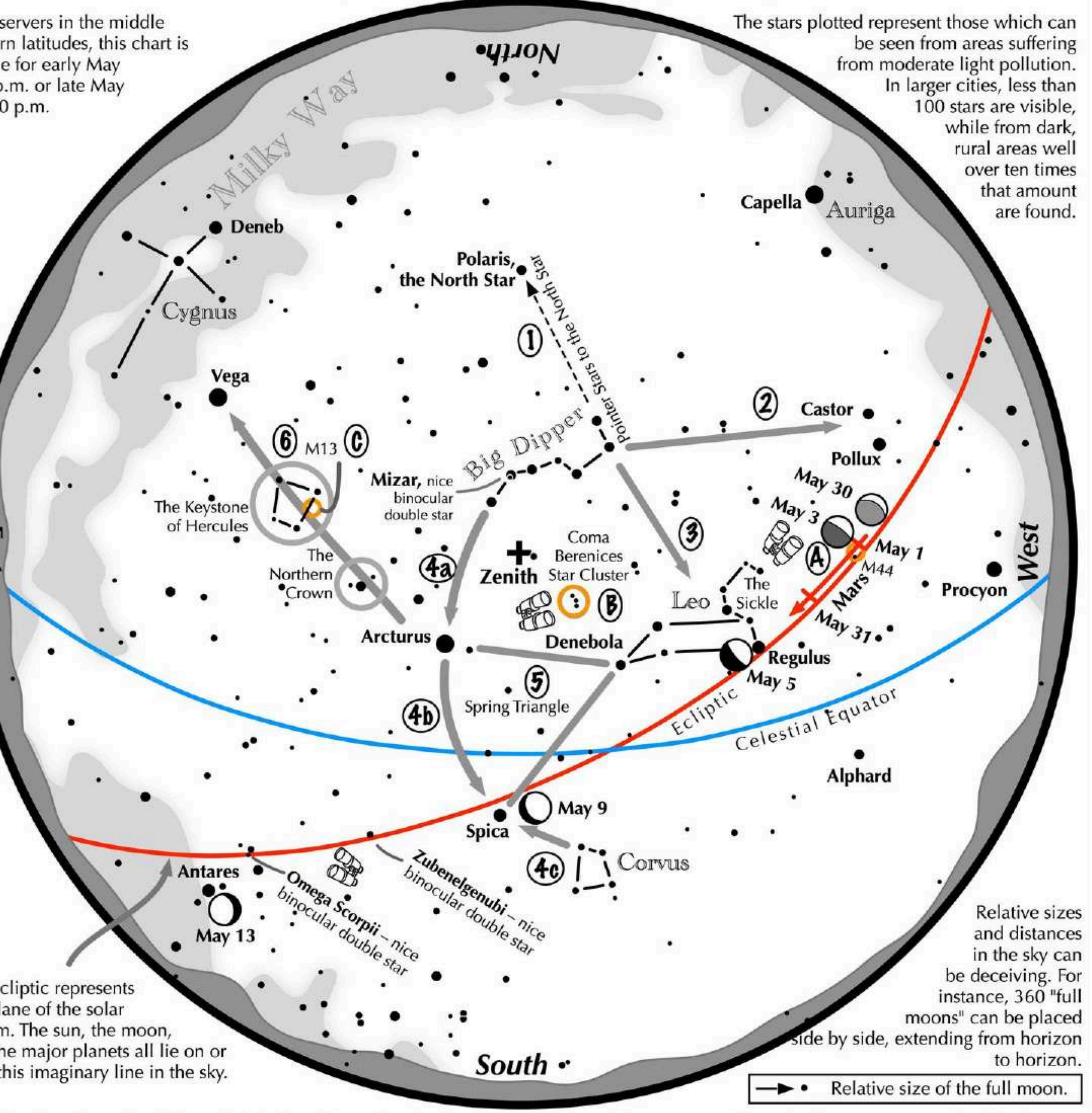
Messier 51, The Whirlpool Galaxy, by member John Harper, using Seestar S50 in equatorial mode!

See Monthly Sky Chart Next Page

Navigating the May Night Sky

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

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

1 Extend a line northward from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.

2 Through the two diagonal stars of the Dipper's bowl, draw a line pointing to the twin stars of Castor and Pollux in Gemini.

3 Directly below the Dipper's bowl reclines the constellation Leo with its primary star, Regulus.

4 Follow the arc of the Dipper's handle. It first intersects Arcturus, then continues to Spica.
Confirm Spica by noting that two moderately bright stars just to its southwest form a straight line with it.

5 Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.

6 Draw a line from Arcturus to Vega. One-third of the way sits "The Northern Crown." Two-thirds of the way hides the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.

Binocular Highlights

A: M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux. **B:** Look near the zenith for the loose star cluster of Coma Berenices. **C:** M13, a round glow from a cluster of over 500,000 stars.