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

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

UPCOMING EVENTS

September 20th: General Meeting
Dr Charles C Vuille of Embry Riddle Aeronautical University's Physical Sciences Department will be speaking to our club. He is currently researching quantum gravity and General Relativity, and has an ongoing interest in the teaching of physics. Please come to what promises to be a great presentation.

October 4th: Telescope Workshop
7pm at Truman Recreation Center Pavilion Area

October 7th: Directors' Meeting
11am Fishhawk Recreation Center

October 18th: General Meeting
6:20pm Laurel Manor Rec Center
"How NOT to Ruin the Holidays" by Mark Graybill. How to purchase optics for youth with an interest in science, including binoculars, microscopes, and telescopes. How to avoid the trash that is marketed to grandparents and other gift-givers in order to avoid killing an interest in science in the young.Also an update on current space projects.

October 29th: Wildwood Fall Festival
Our club will be joining the City of Wildwood at the Wildwood Community Center for their Fall Festival celebration. We will be showing the sky to attendees from dusk into the night.

November 1st: Telescope Workshop
6pm at Truman Recreation Center Pavilion Area. Please note the earlier time this month to accommodate the earlier sunset.

November 4th: Directors' Meeting
11am Fishhawk Recreation Center

November 11: Starry Starry Day and Night
(fallback date Nov 12 for weather.)
Our twce yearly public event where we provide Solar Walk tours during the day and astronomical observation at night will come on November 11th this year. We need volunteers to assist us, whether you have a telescope or not, and no matter your level of technical ability.

Docents for the Solar Walk will guide guests through our scale model of the Solar System, a set of signs that we set up at the relative distances of the planets from the Sun. We share some facts at each stop along the way. We have a script you can use, and you can personalize the tour with your own knowledge and interests.

We will also have astronomers with solar scopes during the day.

Our observational astronomers will be setting up telescopes at night, but during that time we can

use people to help guide our guests to the Astronomy Park from the parking area, as well as do “crowd control” near the telescopes, helping guests find items of interest being shown, or to someone who can answer their questions about space and astronomy.

Nov. 15th: General Meeting
6:20pm Laurel Manor Recreation Center
“Black Holes” by Toni Graybill. What black holes are, how we detect them, new information about them, and their role in the universe.

Feb 24th, 2023: Starry Starry Day and Night
Our next Starry Starry Day and Night will come on Feb 24th, with Feb 25th as a fallback date in the case of inclement weather.

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

NEWS

NASA Night Sky Network

Thanks to our Educational Programs Director Randy Gilbert, our club is now a member of NASA’s Night Sky Network, a service for astronomy clubs that hold public events. NSN will give us broader reach by helping us advertise our public events, provide educational outreach materials that we can use with events such as Camp Villages, and otherwise support us in our work to educate and to reach out to our local communities.

Camp Villages Students Assemble Solar Viewers. Image by member Bob Averitt

Wildwood Fall Festival

Our club has been invited to show the public the evening sky at this year’s Fall Festival at the Wildwood Community Center on October 29th. We were able to establish a great relationship with the Parks & Rec staff during this summer’s program at Wildwood, and our club is looking forward to sharing our talents and knowledge with the City’s families.

Artemis I Launch

There have been two delays to the Artemis I launch to the Moon, resulting in a launch delay to Oct 17th. Both attempts had hydrogen leaks related to the Shuttle-legacy main engines.

NASA will replace damaged seals on the tail service mast of the launch platform. The Flight Termination System batteroes may need to be changed out before the next flight opportunity, requiring a roll back to the Vehicle Assembly Building.But the SLS is only able to perform 2 more rollbacks before it would need to be checked out for mechanical issues caused by the rollback and subsequent rollout. If any other issues arise requiring a rollback arose, such as a hurricane or another repair, then NASA would then have to determine whether the vehicle is still capable of another rollout and flight.

NASA is currently working with Range Safety to determine the best way forward. If the batteries require replacement, there is time before the October launch opportunity to do that.

Artemis I at Launch Complex 39B NASA Image

IN THE SKY THIS MONTH

The Moon:

1st Quarter, September 3rd,
Full Moon, Septemer 10th,
Last Quarter, September 17th,
New Moon, September 25th.
1st Quarter, October 2nd

The Planets:.

Jupiter is the star of the sky this month (so to speak), reaching opposition on the 26th (directly opposite the Sun in the sky, therefore its brightest and largest for the year. That also means that it is highest at midnight that night, making it a good object through the night this month (and October.)

It will be just under one arcminute across during this time, which gives small telescopes with standard quality optics the best opportunity to pick up the details of the bands and zones on Jupiter through our thick Florida air, as well as to catch the Great Red Spot (which is less great and less red now than in decades past.)

The darker stripes across Jupiter are known as Belts ("Belts are Brown"), the whitish stripes between them are called Zones. There is also one Band across Jupiter, the Equatorial Band, a thin belt that divides the two equatorial zones.The top and bottom most dark areas are called the polar Regions.

The light Zones are areas where Jupiter's atmosphere is welling up from below. The color is the result of methane freezing as it rises and cools. In the belts the atmosphere is flowing downward, the methane gas becomes clear again, reveailing the colors of the gasses deeper in Jupiter's atmosphere.

Small telescopes will usually show the equatorial zones as one large whitish stripe across the center of the planet, then the northern and southern Equatorial Belts on each side, then the Tropical Zones bracketing those belts, the pairs of Temperate Belts as a single muddy band outside those, a hint of the Temperate Zones then the Polar Regions. It takes a telescope with good contrast and sharp images to show greater detail. Most scopes will pick up the Great Red Spot, though it is very difficult to see compared to the garish giant spot it was back in the 1970s.

Which brings up the variability of Jupiter's appearance. Not only has the Great Red Spot changed over time, the Equatorial Band has become less strongly marked, and there was a period of time when the Southern Equatorial Belt disappears, hidden completely by methane ice in the atmosphere of Jupiter. Its surface has also been marked by astronomical collisions, such as the dark marks left by the collision with Comet Shoemaker-Levy 9 in 1994. It always pays to look at Jupiter and see what has changed since your last look!

As a binocular object, Jupiter shows no significant surface detail, but the 4 brightest moons are visible as they orbit the planet.

Saturn is also a great object in the evening sky this month. Even with its rings, it is smaller than Jupiter, but it is still bright at magnitude 0.3 in Capricornus. The rings can be seen as bumps on the sides of Saturn at about 25x magnification, so they are just barely beyond the visibility of most binoculars. At about 50x in most telescopes they are clearly visible as a separate structure around Saturn.

Neptune is, like Jupiter, at opposition in September (on the 16th.) At magnitude 7.7 it is too dim to see by eye, but is easily seen in binoculars in Aquarius. Depending on the sky conditions and the optics used it will appear blue or blue-green, and even at low magnification will shine in a way that says, "This is not a star." If you have not observed Neptune before, this month is a good time to catch it, especially as out weather begins to clear as we go into fall.

Finding Neptune in binoculars first, then using nearby stars as a guide to finding it in your telescope as seen in the binoculars is a good approach to finding it, especially if you can use the binocular view to pick out Neptune's position

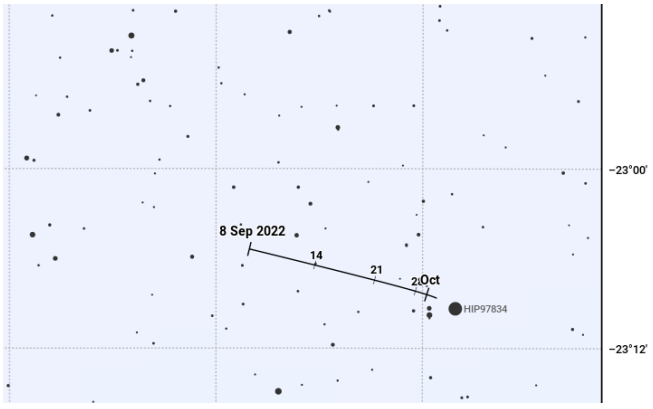
relative to stars visible by eye for guiding your telescope using a Telrad or other reflex finder.

Venus is a morning star this month, moving ever closer to the Sun as the month progresses. **Mercury** is lost in the morning Sun.

Mars rises late, starting the month by rising just before midnight, then getting earlier as the month proceeds, and brightening as it heads closer to opposition.Shortly before dawn it will be about 60 degrees high in the sky, and at over 10 arcseconds of diameter will show good detail for quality telescopes with good resolution. Even modest telescopes should show the small southern polar cap and the large dark mass of Syrtis Major when it is facing the Earth.

Uranus is barely bright enough to be visible by eye under good conditions, but is much more visible in binoculars. It will make a very good warm-up object if you plan to view Neptune this month as well. It is two magnitudes brighter than Neptune, at mag. 5.7, and will show itself as clearly Not a Star in binoculars. It will be a small colored disk in telescopes at around 100x magnification. The color may appear green or blue depending on the instrument used and the sky conditions.

Pluto is a dim magnitude 15.1 starlike object in our sky tonight. A finder chart is the best way to find it with a decent quality telescope, as the finder chart will show you the pattern of stars it is among so that you can pick out the dim star that isn't a star and add Pluto to your list of observed planets. The In-the-Sky.org website maintains a printable finder chart at:
https://in-the-sky.org/findercharts.php?id=A134340



The Artemis Program

As we approach the launch of the first SLS vehicle carrying the Orion spacecraft for the Artemis program, it's a good time to look ahead at the future plans for the program.

Artemis I is a test flight for the SLS vehicle that will send Orion into a high altitude orbit around the Moon for about 2 weeks before it returns to Earth. The heat shield of Orion, and various of its systems will be tested on this test, though it does not yet contain the life support systems it will later need.

The Orion spacecraft launched on the **Artemis II** mission will contain a fill life support system, as well as a crew of two astronauts. The flight will include extensive testing of the spacecraft in Earth orbit, similar to the Apollo 7 mission, before being boosted into an Apollo 8-style loop around the Moon.

Artemis III will send a crew into orbit around the Moon, and will use the SpaceX Human Landing System (HLS) to bring two astronauts to the lunar surface near the south lunar pole. Prior to this mission, the SpaceX HLS will have had a demonstration flight to the Moon, so watch for that!

Artemis IV is planned to fly on the larger SLS 1B launch vehicle, and will connect to the Lunar Gateway, a space station to be constructed in lunar orbit, with Artemis IV delivering the habitation module thanks to SLS 1B's greater power.

Artemis V through VIII will be further lunar landings testing the ability to extend our stays on the Moon, and to garner local resources like water from ice that lays in permanently shadowed areas of the lunar surface. Additional landers may be tested, as well as a permanent habitat for astronauts.