

VILLAGES STAR

Newsletter of The Villages Astronomy Club

Volume 4, Number 4

April 2023

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

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(please include TVAstro in subject line)

UPCOMING EVENTS

April 7th, 11am: Directors' Meeting

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

April 4th, 7:30pm: Telescope Workshop

Our monthly telescope workshop will be held at Truman Recreation Center, near the pavilions (behind the pool from the parking area.) Address is 2705 Canal St. in The Villages (just north of 466A.)

Bring your questions, your telescopes or binoculars, and share information with other observers on observing instruments and techniques, accessories, locations, and upcoming events. Those who are just interested in getting a look through a telescope are welcome to attend.

General Meeting, April 16th, 2023:

Henrietta Leavitt, by Linda Meng

This month club member Linda Meng will be telling us about the life and work of Henrietta Leavitt, a woman who was a cataloguer at the Harvard University Observatory who went on to make one of the key discoveries in the nascent field of astrophysics, revolutionizing our understanding of the universe and our place in it. Her discovery still affects astrophysics and is part of how the universe is studied to this day.



Henrietta Leavitt, revolutionary astrophysicist

April 15th, 2022: Fruitland Park Astronomy

The Fruitland Park Astronomy Club meets for an evening of observing and talk on the third Saturday of the month every month, conditions allowing, at the Cales Soccer Field in Fruitland Park at 500 Shiloh Road (at the corner of Shiloh Road and Dixie Avenue, north of the Fruitland Park water tower.) Village Astronomy Club members and the public are welcome. Bring your telescopes, binoculars, or just your eyes and your interest. Gate opens at 5pm.

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.

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

NEWS

Space Academy

As reported in last month's Villages Star, the club is sponsoring a new activity called "Space Academy." This is, if you will, "Astronomy Lite", presentations of basic astronomy and space exploration information given in an entertaining format. We will be showing videos, hosting speakers, and otherwise bringing the basics of astronomy to our members in this venue. Each session will include discussion of the evening's presentation among the attendees.

We are planning to hold Space Academy on the first Tuesday of the month at Truman Recreation Center's Studebaker room, on the same night as the Telescope Workshop. This will give an alternate activity in the event that weather precludes the Telescope Workshop (very likely in the summer), as well as being an event for those who have no interest in running a telescope of their own. However, timing of the events will allow for those at Space Academy to have a look through a telescope when they leave, and conditions allow.

As you read this, we will either be having our New Club Survey for the Space Academy, or will just have finished it. We will be sending notices out about the survey through our email list and Facebook soliciting your response when the survey period starts. Watch Page 40 of Recreation News each week to see the listing and contact information there! Watch your email!

When the time comes, our president will be collecting contacts to demonstrate an interest in the Space Academy to allow Recreation to justify providing us with a regularly scheduled room for our meetings.

For those of you who attended our

Astronomy 101 classes by Ken Katta last year, this is an extension of that sort of activity. The excellent attendance and interest in those classes showed that our club can easily support a regular activity of this nature.

Stay tuned for news!

Relativity Space's 3D Printed Rocket

Last month, Relativity Space scrubbed two launch attempts of their 3D printed Terran 1 rocket from the space coast here in Florida. The first launch was cancelled by propellant temperatures being too high--the Terran 1 counts on supercooled propellants to pack more punch into a smaller volume in its tanks. The second launch was cancelled due to pressure being out of tolerance in its second stage fuel tank.

As of this writing, Relativity has backed off on launch attempts until they have made further review of the Terran 1 and its systems. Hopefully news will be forthcoming soon with a new launch date.

SpaceX Launches

So far this year SpaceX has already reached a record launch tempo for their Falcon 9 rocket, including a pair of launches within 4 hours of each other. Their stated goal for the year is 100 launches, including five launches of the Falcon Heavy, their triple booster rocket that is more powerful than Apollo's Saturn IB and is the most powerful rocket currently in operation.

As you read this, SpaceX is likely to beat the Falcon Heavy's power record, and the Saturn V's power record, with the first orbital launch of the Starship rocket from Boca Chica, Texas within just a few weeks. As of late March, final updates to the launch pad in Texas are being performed to prepare for the full power static fire test of the Starship Booster, after which the Starship spacecraft, the second stage of the vehicle, will be placed atop the booster for an orbital launch attempt.

ULA Vulcan Prepares for First Flight



ULA's First Vulcan Flight Booster Undergoes Testing at Space Launch Complex 41

United Launch Alliance's new rocket to replace both the Atlas and Delta launch vehicles, the Vulcan-Centaur, is currently at the Cape preparing for its first launch.

In mid-March it successfully completed tests of loading and pressurizing the propellant tanks on the first flight booster. If all goes well, the first launch, carrying a U.S. robotic lunar lander built by Astrobotic, will launch this spring.

Vulcan is a new-generation replacement for the relatively expensive Atlas and Delta vehicles with a heritage going back 65 years across many versions of both vehicles. The Atlas was developed as an early ICBM, coming in just behind the first Titan rocket version in service deployment in the early 1960s.

The Delta's history goes back even further, when excess Thor Intermediate Range Ballistic Missiles were being phased out of service in Europe in the late 1950s. Their booster sections were mated with the Delta upper stage to produce the Thor-Delta rocket, later called Delta. The Delta went through several design iterations, including the replacement of its first stage engine with excess Saturn I H-1 engines as its original IRBM rockets became scarce. Later, Rocketdyne developed a simpler, cheaper version for use on the later Delta launchers.

Today's Delta IV is a further evolution of

that vehicle, which was cheaper than the large Titan III and Titan IV vehicles it replaced, but now is too expensive to operate in a world where SpaceX has set a new low bar in cost to launch to orbit or outer space.

So ULA developed the Vulcan to cover the roles of both the Atlas V and Delta IV at a lower cost in response.

Part of the need for the Vulcan came from the need to eliminate the Russian RD-180 rocket from U.S. military launches. This is the main rocket of the Atlas V, and while its use resulted in a considerable cost saving in the 1990s, today a rocket made by Russian/Ukrainian companies and delivered by Russia represents an unacceptable security risk to U.S. military interests.

The Delta IV uses U.S. rocket engines, but is far more expensive to build and operate than the Atlas V, at about \$300M per launch, compared to about \$120-200M for an Atlas V or \$50-75M for a Falcon 9.

While the Vulcan will not initially be recovered, extended plans call for the ability to recover the engine section of the first stage to reduce costs and allow re-use of the most expensive components on the rocket. Plans to develop this capability have not yet been revealed, with ULA president Tory Bruno stating that all attention is currently focused on achieving safe, routine flight capability of the new rocket. Recovery and re-use plans will be developed once those goals are achieved. This is similar to Falcon 9, which initially had no recovery capability, and went through a series of tests and design changes to lead up to and later enable recovery and re-use years after its first operational flights.

For more information, visit:

<https://www.ulalaunch.com/rockets/vulcan-centaur/countdown-to-vulcan>

IN THE SKY THIS MONTH

The Moon:

Full Moon, April 6th
Last Quarter, April 13th
New Moon, April 20th
1st Quarter, April 27th
Full Moon, May 5th

Venus will continue to rise higher in our evening sky through April. At magnitude -4, it will remain a bright evening star through the month, reaching greatest elongation (distance from the Sun) in May.

Mercury rises away from the Sun in the evening sky in the early part of the month, reaching greatest elongation on the 11th, at 19 degrees away from the Sun. It makes a great binocular object for observation.

Mars remains high in our evening sky, crossing Gemini from the feet toward their chests through the month. It starts the month only 1 degree from M35, the Shoebuckle Cluster, which lies just southwest of Mars. Use Mars as a visual guidepost to see this nice cluster through binoculars or a low power telescope view.

Jupiter sets with the Sun at the beginning of the month, reaching inferior opposition (behind the Sun) on the 11th, then rising just before the Sun in the morning sky starting on April 17th. It will return to the evening sky in July this year.

Saturn rises in the early morning hours, a little earlier each day. In June it will rise before midnight again to become an evening object.

Uranus lays in the west as the Sun sets, at magnitude 5.8. It is visible in binoculars as a colored star, and as a disk in telescopes at magnifications over about 100x. It will disappear in the Sun's glare in early May.

Neptune rises in the early morning hours through this month, and will return to the evening sky in June.

For more information on sky events this month:

<https://in-the-sky.org/>

Calendar

April

4 Telescope Wrkshp 7:30pm Truman Rec Ctr
7 Exec Meeting 11am Fishhawk Rec Ctr
15 Fruitland Park Astronomy 5pm 300 Shiloh Rd
Fruitland Park
18 TVAC General Meeting: Linda Meng, Henrietta Leavitt 6:30pm Laurel Manor Rec Ctr
20 New Moon

May

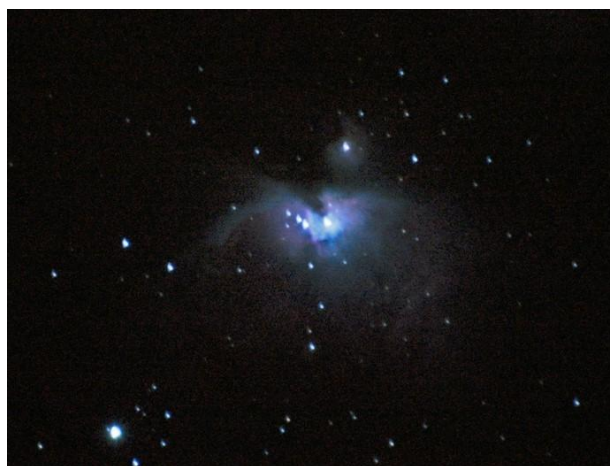
2 Telescope Workshop 7:30pm Truman Rec Ctr
Possible first Space Academy Meeting 6pm
5 Exec Meeting 11am Fishhawk Rec Ctr
15 General Mtg 6:30pm Laurel Manor Rec Ctr
19 New Moon
20 Fruitland Park Astronomy 5pm 300 Shiloh Rd
Fruitland Park

June

2 Exec Meeting 11am Fishhawk Rec Ctr
6 Telescope Workshop 8pm at Truman Recreation Center, possible Space Academy 6pm
17 Fruitland Park Observing 5pm 300 Shiloh Rd
Fruitland Park
18 New Moon
20 General Mtg 6:30pm Laurel Manor Rec Ctr.

Calendar on the web:

<https://vlgastroclub.org/calendar/>



M42, The Great Orion Nebula
Nikon D5600 at 300mm FL on fixed tripod.
60 stacked images of 1.3s each.
By Mark Graybill