VILLAGES STAR

Newsletter of The Villages Astronomy Club

Volume 7, Number 2
February 2026

Club Website:
http://vlgastroclub.org/

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

UPCOMING EVENTS

Starry Starry Night, Feb 7th, 6pm

Everglades Rec Center, Basketball Court & Multi-Use Field area.

Our 1st Starry Starry Night of 2026 will feature stunning views of Jupiter near opposition, when it's at its brightest and closest. Saturn will also be in the sky, with the rings starting to open far enough to see the center gap.

Winter's cosmic wonders will stand above us in the sky, including the Great Orion Nebula, the Seven Sisters, the Hyades, the Double Cluster, and the Little Dumbbell Nebula.

Attendance is open to anyone with a Villages ID, including guest IDs.

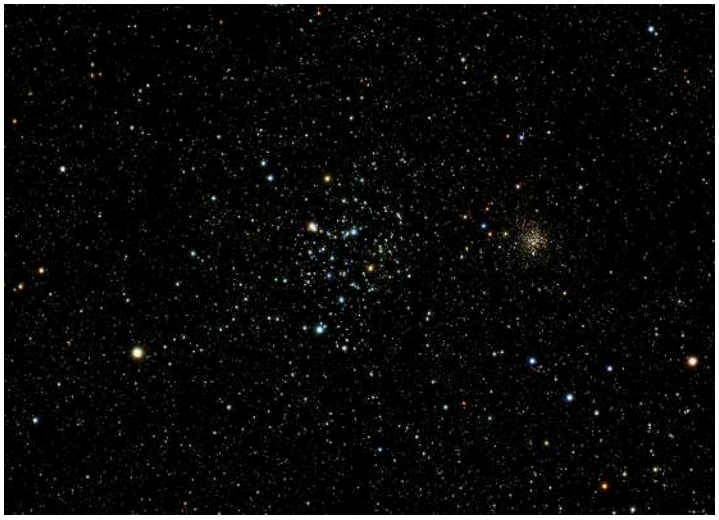
The public program will start at 6pm. Setup for astronomers and volunteers will start at 5pm. See additional information below.

Observers Workshop, February 2nd, 6:30pm, Truman Rec Ctr Pavilion, 2705 Canal St.

Join us at our monthly workshop for observers to get assistance with their instruments, learn their way around the sky, and share tips and tricks with their fellow observers.

This month we will be preparing our astronomers for Starry Starry Night. Astronomers, bring your scopes to practice on the objects on the Starry Starry Night list (at end of newsletter), add new objects to your repertoire of objects that you show, and practice showing the sky to the public.

Location & time: Truman Recreation Center Picnic Pavilion, 2705 Canal Street, 6pm-8:30pm. The picnic pavilion is behind the recreation center, behind the pool.



The Shoe Buckle Cluster, M35, by member Craig Henry. The smaller second cluster, NGC 2185, shares the field with M35. This is one of the stellar wonders we will be viewing at Starry Starry Night.

Space Academy, Feb 2nd, 6:30pm Truman Rec Ctr, 2705 Canal St.

This month's space academy we will be discussing pre-telescopic astronomy in a presentation by our own Frank Ancona. This will be the first of two parts on the subject, from ancient times to the early Renaissance.

Executive Directors' Meeting, Feb 6th, 11am-12pm, Fishhawk Rec Center, 2318 Buttonwood Run

All members welcome to our monthly planning meeting. This month we'll be planning

for our next Starry Starry Night event on February 7th, The Villages Outdoor Expo on the 27th and 28th, and March's Astronomy Day.

Fruitland Park Astronomy Group, Feb 21st, 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!

General Meeting, Feb 17h, 6:30pm: Toni Graybill, "The High Energy Physics of Our Sun"

Join us at Laurel Manor Rec Center, 1985 Laurel Manor Drive, at 6:30pm for a presentation by member Toni Graybill about how we use the Sun as a high energy physics laboratory. Learn about the high energy physics phenomena, and the instruments we use to study them in space around the Sun.

Smart Scope Meeting, Homestead Astronomy Park, Jan 21st, 5pm, 6227 Meggison Road

Our Smart Scope meeting is focused on using smart telescopes, telescopes with smart controllers, and astrophotography both traditional and live-stacking. If you want to know more about how smart controllers can put your astronomy in "easy mode", come and see what current devices can do!

Visual observers are also welcome to come and take advantage of the Astronomy Park while we have it open after hours.

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
	John Roarke

Newsletter Contact: saundby@gmail.com

See Calendar at End of Newsletter, before star chart.

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

NEWS

Artemis II Rollout & Prep for Launch

The Massive SLS booster for Artemis II has rolled out to launch pad LC-39B in preparation for its launch to the Moon sometime in the next few months. Launch could come as early as February 8th, depending on how testing and launch preparations go.

Full Moon Rising Behind Artemis II. NASA image.

To start, the SLS vehicle will undergo a “Wet Dress Rehearsal”, tests of filling and pressurizing the propellant tanks for the core rocket and second stage. This is also a practice for the team operating the vehicle, going through the same procedure as they will follow for an actual launch, except for igniting the engines and solid rocket motors.

The Artemis II launch stack stands at LC-39B, the same site that launched Apollo 10 to the Moon in May 1969. NASA image.

Artemis II will carry a crew of 4 astronauts around the Moon in a mission similar to that of Apollo 8. This will be the first time that humans have gone into deep space, and to the Moon, since Apollo 17, in December, 1972.

This mission will go into space farther beyond the Moon than any of the Apollo missions, marking a new record for distance flown from Earth for humanity. It will also carry the first non-American citizen to the Moon, Jeremy Hansen, Mission Specialist, is Canadian.

Artemis II Crew, from left: Jeremy Hansen, Mission Specialist. Victor Glover, Pilot. Reid Wiseman, Commander. Christina Koch, Mission Specialist.

This flight will be the first flight of SLS and the Orion capsule system with crew on board. It will also be the first complete Orion capsule--prior test capsules have not included the full environmental control and life support system on board. It also marks another first: this will be the first spacecraft to the Moon with a toilet on board! The Orion is much larger than the Apollo capsule, and includes enough space to provide a small privacy cabin with a toilet that operates in zero gee. It is different than the ones used on the International Space Station, but it was tested and developed aboard the space station.

Mission Timeline

There are a number of possible launch dates over the next three months, though the hope is that the launch will be early in the currently planned time frame. The earliest launch date was February 6th, but delays during testing at the launch pad have pushed the earliest possible launch date back to February 8th.

Once launched, the upper stage of SLS, the Orion capsule and the European Service Module will be placed in a high Earth orbit. The orbit will last for about a day, during which time

the spacecraft and its systems will be checked out prior to departure for the Moon over a period of about two days. Once everything has checked out, the upper stage will be fired to place Orion on a trajectory for the Moon.

On the third day while coasting toward the Moon, a trajectory correction maneuver will be performed, and zero gee CPR demonstrations by the astronauts.

On day 4, another trajectory correction burn will be performed, and the crew will review their lunar surface imaging plan in preparation for their close encounter with the Moon.

On day 5, the astronauts will perform a demonstration of rapid spacesuit donning and pressurization, as they would do in an emergency. On this day, the Orion will enter the Moon's sphere of gravitational influence.

Launch of Artemis I, November 16, 2022. This launch will look very similar, but with a rocket decorated to celebrate America 250. NASA image.

Day 6 is Lunar Flyby day. They will reach both their closest point to the Moon on this day, as well as their farthest point from the Earth. They will have a busy day of lunar imaging, and communications with Earth on the big day.

On Day 7 the Orion will leave the Moon's sphere of gravitational influence, and the astronauts will have most of the day off to rest after the prior days' activities. Initial maneuving burn for the return to Earth will be made.

On Day 8, there will be a radiation shielding demonstration, with the astronauts taking measures as if there had been a coronal mass ejection from the Sun or some other energetic event. They will also take over control of the capsule manually for a while to demonstrate manual flight controls.

On Day 9 preparations for re-entry and landing will occur, including tests of the Orthostatic Intolerance Garments. These are special suits that the crew will wear during re-entry to help their bodies properly manage internal fluids when returning to a high-gee environment (re-entry) after many days in free-fall. The OIG garment is a compression garment that is made to help the body manage fluids in the absence of gravity. The crew will put on and test the garment in two shifts, before taking them off again.

Day 10 is the return to Earth, likely the most dangerous day of the entire voyage after launch. The Orion capsule on Artemis II has the same heat shield as the one that had problems on Artemis I (which landed safely, but experienced more damage during re-entry than expected), but the re-entry trajectory of Artemis II has been changed from that of Artemis I to place less stress on it. Other approaches to dealing with the heat shield were considered, but this was considered the safest approach for now. Artemis III and later will all feature an upgraded heat shield. They had considered using the heat shield from the Artemis III capsule instead, but changing the heat shield could have caused other safety problems with the Orion, and after reviewing all their options (changing capsules, delaying flights, etc.) the

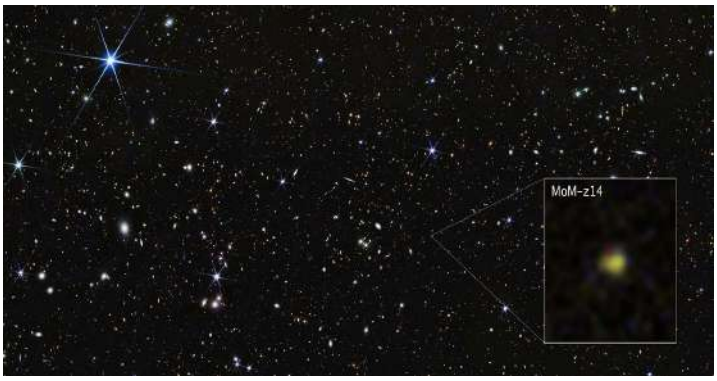
current plan was determined to be the best approach and was approved by everyone involved with the program, including the astronauts, head of the Astronaut Office, and the independent safety officers (one of whom who was very critical of the Artemis I heat shield, and who fully approves of this flight's plan and use of this heat shield.)

Late News: Due to problems with ground support equipment during the wet dress rehearsal in February, launch will be no earlier than March 6th.

Full story:
https://www.nasa.gov/mission/artemis-ii/

Artemis II Updates/Current News Blog:
https://www.nasa.gov/blogs/artemis/

NASA Artemis News and Updates on X:
https://x.com/NASAArtemis



JWST has imaged a galaxy formed in the very young universe, earlier than many models say that it is possible for galaxies to form. NASA/ESA/STSci image.

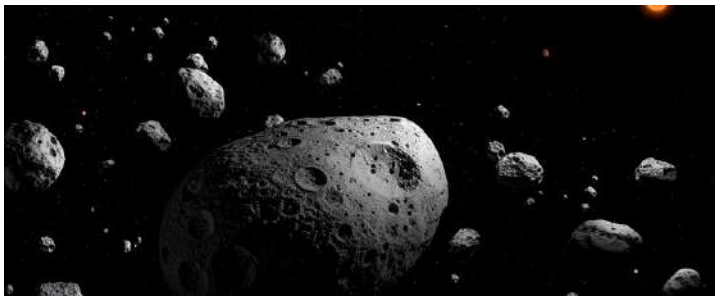
JWST Finds New Earliest Galaxy

NASA's James Webb Space Telescope (JWST) has confirmed the most distant galaxy yet detected: MoM-z14, existing just 280 million years after the Big Bang. Using its NIRSpec instrument, astronomers measured a cosmological redshift of 14.44, meaning its light—stretched by the universe's expansion—has traveled for about 13.5 billion years out of the universe's 13.8-billion-year age.

This bright, compact galaxy appears surprisingly luminous, dense, and chemically enriched (e.g., high nitrogen levels), far exceeding pre-JWST theoretical predictions—part of a growing population 100 times brighter than expected. It shows signs of clearing primordial hydrogen fog, offering clues to early reionization and rapid galaxy formation processes. As lead author Rohan Naidu noted, the early universe "looks nothing like what we predicted," both challenging and exciting models of cosmic dawn.

Full Story: NASA Webb Pushes Boundaries of Observable Universe Closer to Big Bang

Vera Rubin Telescope Early Data Finds Rapidly Turning Asteroids



Early data from the Vera C. Rubin observatory has located the first known asteroid over 500km wide rotating on its axis in about two minutes. The rapid multiple imaging of the sky done by the telescope uniquely allows this type of discovery. NSF-DOE artist's concept image.

Astronomers using early commissioning data from the NSF–DOE Vera C. Rubin Observatory have discovered the fastest-spinning asteroid larger than 500 meters ever found: 2025 MN45. This main-belt asteroid, 710 meters (0.4 miles) in diameter—roughly the size of eight football fields—completes a full rotation every 1.88 minutes (about 113 seconds).

The finding comes from just ~10 hours of observations across seven nights in April & May

2025 with the observatory's LSST Camera, the world's largest digital camera. This marks the first peer-reviewed paper (published January 7, 2026) using LSST Camera data.

The rapid spin implies exceptional internal strength, akin to solid rock, to avoid fragmentation which is surprising for typical "rubble pile" asteroids. It provides new clues about asteroid composition, structure, and evolutionary history, including past collisions.

The same dataset revealed 19 super- and ultra-fast rotators (periods under ~2.2 hours), most in the main belt and previously hard to detect at such distances. Lead researcher Sarah Greenstreet noted this highlights Rubin's power to probe small, rapidly changing Solar System objects even before its full Legacy Survey begins.

Full Article: NSF–DOE Vera C. Rubin Observatory Spots Record-Breaking Asteroid in Pre-Survey Observations | NOIRLab

The Heart Nebula by member Scott Knapp. Dwarf II with SVBony dual-band nebula filter.

IN THE SKY THIS MONTH

Also refer to the sky map on the last page.

THE MOON

Full Moon, Feb 1st
Last Quarter, Feb 9th
New Moon, Feb 17th
1st Quarter, Feb 24th
Full Moon, Mar 3rd

THE PLANETS

February 1, 2026

Planet	Rise	Transit	Set
Mercury	1:47 am	7:50 am	1:53 pm
Venus	1:38 am	7:41 am	1:44 pm
Mars	12:49 am	6:52 am	12:54 pm
Jupiter	11:21 am	5:22 pm	11:28 pm
Saturn	4:06 am	10:08 am	4:09 pm

February 15, 2026

Planet	Rise	Transit	Set
Mercury	6:00 am	11:30 am	5:00 pm
Venus	5:45 am	11:15 am	4:45 pm
Mars	11:30 pm	5:45 am	11:45 am
Jupiter	10:00 am	4:00 pm	10:00 pm
Saturn	3:00 am	9:00 am	3:00 pm

February 28, 2026

Planet	Rise	Transit	Set
Mercury	6:30 am	12:00 pm	5:30 pm
Venus	6:15 am	11:45 am	5:15 pm
Mars	10:30 pm	4:45 am	10:45 am
Jupiter	9:00 am	3:00 pm	9:00 pm
Saturn	2:00 am	8:00 am	2:00 pm

The Planet Parade nonsense will kick back into full gear again this month. It worked on people before, so they're going to pull it out again. It will probably be ongoing for the rest of our lives, thanks to the way media works (or fails to) these days.

We will have some very nice planet showings this year, but it won't look anything like the "magical" graphics you'll see on the internet or TV with bright glowing planets all lined up like they're queued for a movie.

First, the planets are ***always*** in a line. The planets we can see (even with binoculars or amateur telescopes) all orbit the sun in the *ecliptic*, a line in the sky that marks where the plane of the solar system lies. A couple of planets wander further than the others, notably Pluto and far outer planets like Sedna, but you won't see these in the sky. (You can see Pluto with a telescope of large aperture, but it only looks like a

very dim star.)

Second, the planets will be spread across a very large area of the sky. They won't be close enough to appear to be in a row. Saturn will be way off to the west, Jupiter in the high southeast.

Third, only 4 planets are easily visible: Venus, Jupiter,Saturn, and Mars. Mercury is visible to the eye, but is usually hard to make out and difficult to identify as a planet.

Mars will not be part of the "planet parade" that will be touted this month. Mercury is, it will be low in the west nearly lost in the Sun's glare.

Uranus and Neptune will be counted in as well, though they are invisible to the eye.

Fourth, the planets will be spread over a wide arc of over 100 degrees in the sky. They won't look close.

Nevertheless, enjoy the planets this month. News and media will claim there are specific times and dates where the planet parade will be 'best' or when it will happen. The planets already look great, any night is a good night, so don't wait for something special (that'll almost certainly happen behind a thick layer of clouds).

Get out when weather permits, enjoy the sky, and have a good laugh at the ridiculous memes with glowing rows of planets and extra sparkles.

Jupiter reached opposition in January, and it will remain large and bright this month. Jupiter will be magnitude -2.6, and will look like a very bright star in Gemini. At 46 arcseconds wide, the surface details will be as large and clear as they get. Magnifications of 100-150x will bring out bands for all scopes, on scopes with tracking mounts you can go to higher powers, up to 50x per inch of aperture. 250x to 350x will bring out details in the bands, spots (Great Red Spot and others at the edges of the bands), and other small or low contrast details.

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

Mercury will make a brief appearance in the evening sky low on the western horizon this month. From about the 6th on, it will be visible with a clear western view at magnitude -1. It will set before full dark. You can see it by eye, and binoculars will bring out the color and a hint of a disk (though no detail.)

It will be at greatest elongation (farthest from the Sun) on Feb 19th, meaning it will also be highest above the horizon and easiest to see near that date. After the 22nd it will get much lower in the sky every day, until it leaves the evening sky in the first week of March, reappearing as a morning star next month.

A telescope will show the planet as a ruddy disk at 50-75x after the 15th. The planet starts the month at only 5 arcsec, but gets larger as the month goes on, ending the month at 9 arcsec, nearly double the size it started.

Mercury doesn't have any significant surface detail when viewed by eye. However, imaging at high powers and careful image processing can bring out the largest features of Mercury. Its appearance low in the sky hampers seeing anything more.

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

Venus reappears in our evening sky this month, setting inside the Sun's glare. While it is difficult to observe this month, it will rise higher over the next few months.

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

Mars has entered the early morning sky, and will rise a little higher each morning. It will remain dim and low in the sky throughout the month. It won't pass into the evening sky until this fall.

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

Saturn is in the western sky at sunset, descending lower with each passing day. In early March it will leave the evening sky, so enjoy it while you can. At magnitude 1.0 it is still bright, and the rings are open enough to see them as rings again. Saturn will go behind the Sun in March, then return to our early morning sky in April.

This month, catch your final early morning views until this fall. See if you can see the shadow of the rings on the surface of Saturn!

Saturn Moon and Ring finder tool:
https://theskylive.com/saturn-rings-and-moons

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

Uranus is visible in the evening sky in Taurus southwest of the Pleiades (The Seven Sisters). At mag 5.6, it's too dim to see by eye in our skies, but it can be seen in binoculars or a telescope. At 3.6 arcsec in size, it is small, and will appear as a green or blue colored fuzzy "star". It will appear as a faint disk at about 100x magnification, go to 150x if your scope is 3" (75mm) aperture or more to clearly see a planetary disk. Its color varies by atmospheric conditions and your telescope's aperture, smaller scopes show a stronger color, but the color can vary from green to soft blue.

Uranus finder chart:
https://in-the-sky.org//data/object.php?id=P7

Neptune lies near Saturn in Pisces. Look for a bluish or greenish non-stellar object when using binoculars or a telescope. Colors may be muted by sky conditions, but even with small apertures it should stand out as clearly not a star, and show a slight disk at over 100x magnification. It is at mag. 7.9 now, so while 35mm or 50mm binoculars can catch it, it will show better in large aperture binoculars (75-120mm) or in a telescope.

If you seek it with a telescope, it's a good object to see in small apertures, it will look like a bright colored star, usually a rich blue. If you have a scope on a tracking mount, go to the highest practical magnification for your telescope (50x per inch of aperture, or 2x per mm) to see the disk more clearly as a disk, rather than a bright star.

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

Star Cluster Season

February and March are the season for seeing star clusters. Open clusters in particular, though many globular clusters are visible as well, especially if you're willing to stay up late.

The Messier catalog provides a good starting point for star clusters to see, 27 open clusters and 29 globulars. About another 20 we can see are in the Caldwell catalog.

Large clusters, like the Pleiades and Hyades, are best viewed with binoculars. Also, don't forget that many nebulas have star clusters associated with them, like Caldwell 50, the Rosette Nebula.

The Rosette Nebula and its cluster at center, by member John Harper, using a SeeStar S30.

Club Calendar

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

February 2026
2 Space Academy 6:30pm, Observing Workshop 6:30pm, Truman Rec. Ctr. 2705 Canal St.
6 Exec Meeting
7 Starry Starry Night, Saturn, Jupiter, Winter Constellations, observing 6:30-8:30
17 General Meeting, Toni Graybill, *"The High Energy Physics of Our Sun"*
18 EAA Mtg, Homestead Astronomy Park, 6:30pm, New Moon
21 Fruitland Park Observing, 5pm, 300 Shiloh St. Fruitland Park
27-28 The Villages Outdoor Expo, 10a-3pm

March 2026
2 Space Academy 6:30pm, Observing Workshop 7pm, Truman Rec. Ctr. 2705 Canal St.
6 Exec Meeting, 11am Fishhawk Rec Center, 2318 Buttonwood Ln
8 DST BEGINS
17 General Meeting, To Be Announced
18 EAA Mtg, Homestead Astronomy Park, 7:30pm
21 Fruitland Park Observing, 5pm, **300 Shiloh St. Fruitland Park**
21 Dade Battlefield Star Party, 8-10pm.
28 Astronomy Day Homestead Rec Center.

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

Telescope Tips

YOUR MOUNT is the most important part of your telescope. It holds the telescope precisely on target so that you can see things in the sky. It's more important than the optics. A bad scope on a good mount will let you see things in the sky. A good scope on a bad mount is useless.

Your mount has to be able to both hold the telescope steady, but also allow it to move to follow the sky. Even at low powers, with the widest field of view, an object will only stay in view for 2-3 minutes. Some mounts are built to follow the movement in the sky using motors. Less expensive mounts usually do not, or they require an extra cost add-on called a clock drive to do so.

If you have a non-motorized mount, when you put it in position, it needs to stay there, not wobble or drift. When you do move it, it should be able to move easily with a minimum of effort, then stay put when you reposition it. If a mount has to be unlocked to move then relocked to hold it in place, that triples (at least) the effort of viewing something with that mount.

A balanced Dobsonian or German Equatorial mount solves this problem. The Dobsonian mount is the simplest to use, and doesn't have any extra counterweights added to increase the weight or complicate setup. That's why most experienced astronomers recommend it as a beginner's scope. (Though some commercially made scopes use a lockdown system because they don't allow the scope to be moved along its axis to balance it.)

German Equatorial mounts add moveable counterweights to allow the telescope to be balanced on the mount. This allows a slow motion control that turns a worm gear to move the telescope, and if the mount is aligned at least roughly to the north pole, only a single axis needs to be moved to keep an object in view. The cost is that the counterweights double the weight of the whole telescope.

Boy Scout Astronomy Merit Badge Class

Our club's volunteers returned to the Scouting America Sand Hill Scout Reservation to teach Scouts interested in earning their Astronomy Merit Badge.

Viewing weather was poor, and the outside was extremely uncomfortably cold, so we weren't able to engage in either solar or night time viewing. We were able to cover much of the merit badge's requirements with our indoor presentations, however.

We had about 40 scouts come for the

program, and the parents were quite interested, too, asking us questions about space and astronomy.

Ron Collum lectures on telescope types and use. Image by Randy Gilbert.

Toni Graybill describes the inner workings of the Sun. Image by Randy Gilbert.

Another View of Ron's Talk, showing the spacious dining center at the camp. Image by Mark Graybill.

Toni Graybill speakin on the Sun to an interested group of Scouts. Image by Mark Graybill.

Randy will be following up with the Scouts to set up remote observing sessions using his remote observatory scope shared through online meeting software. It's great that we can use technology to make up for poor skies to allow the Scouts to still fulfill the requirements of their merit badge!

Member John Rourke has moved up to a new SeeStar S50, and shares his 'first light' image of NGC 2175 with the club.

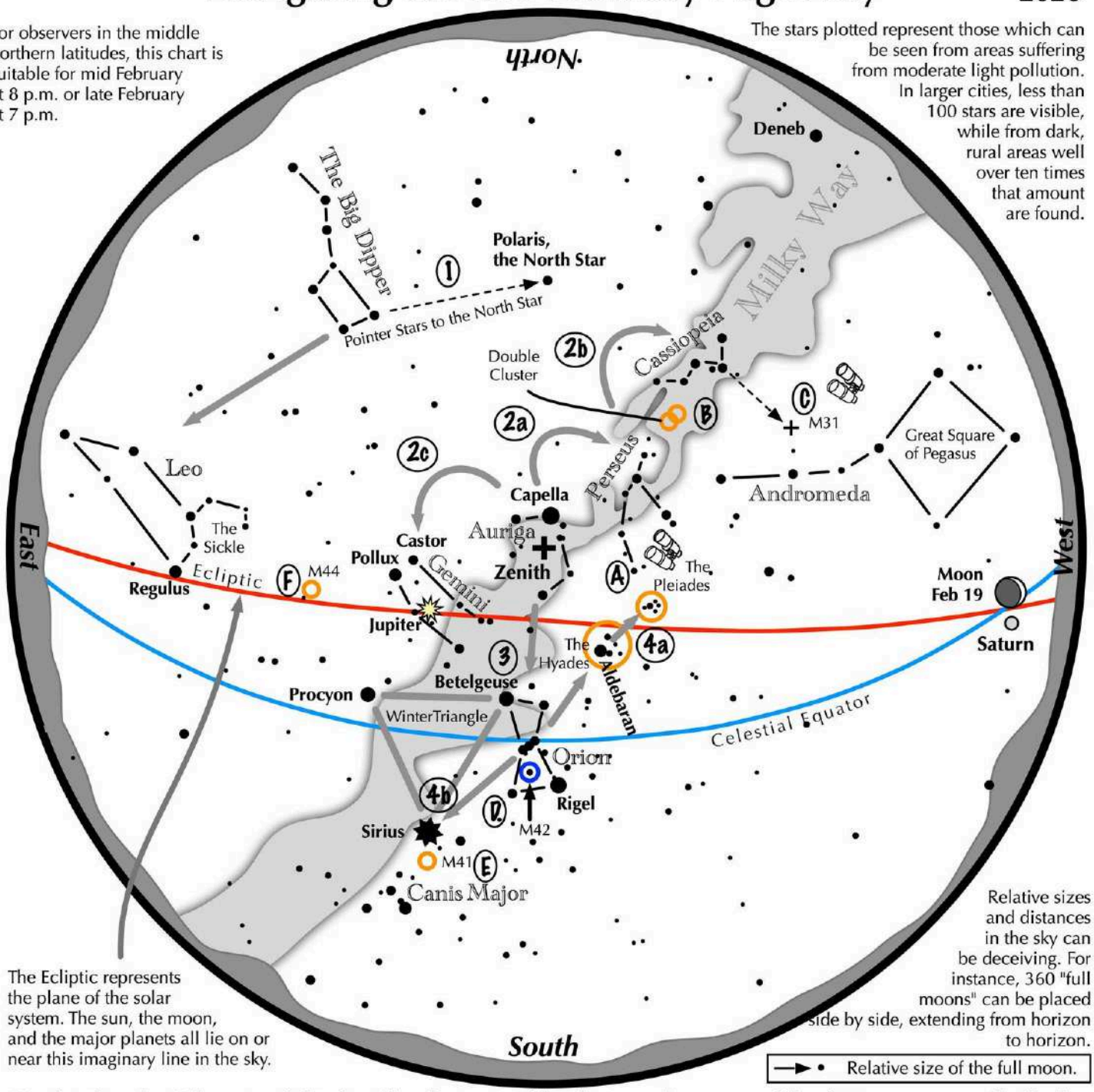
See star charts & special observing notes on following pages:

Navigating the mid February Night Sky

2026

For observers in the middle northern latitudes, this chart is suitable for mid February at 8 p.m. or late February at 7 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 February night sky: Simply start with what you know or with what you can easily find.

1. Above the northeast horizon rises the Big Dipper. Draw a line from its two end bowl stars upwards to the North Star.
2. Face south. Overhead twinkles the bright star Capella in Auriga. Jump northwestward along the Milky Way first to Perseus, then to the "W" of Cassiopeia. Next jump southeastward from Capella to the twin stars of Castor and Pollux in Gemini.
3. Directly south of Capella stands the constellation of Orion with its three Belt stars, its bright red star Betelgeuse, and its bright blue-white star Rigel.
4. Use Orion's three Belt stars to point northwest to the red star Aldebaran and the Hyades star cluster, then to the Pleiades star cluster. Travel southeast from the Belt stars to the brightest star in the night sky, Sirius, a member of the Winter Triangle.

Binocular Highlights

A: Examine the stars of two naked eye star clusters, the Pleiades and the Hyades.
B: Between the "W" of Cassiopeia and Perseus lies the Double Cluster.
C: The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval.
D: M42 in Orion is a star forming nebula. **E:** Look south of Sirius for the star cluster M41. **F:** M44, a star cluster barely visible to the naked eye, lies southeast of Pollux.

Starry Starry Nights February 7th, 2026 Observing List

Planets

Jupiter, mag -2.2, 11x diam of Earth, 10 hour day, 12 yr orbit, 5x as far as the Sun now (45 light minutes.)
Saturn, mag 0.97, 9x diam of Earth, 29.4 year orbit, density 0.7, 11x as far as Sun right now (90 light minutes.)
Uranus, mag 5.7, 98 degree tilt, 4x larger & 14x heavier than Earth, 84Y orbit, 3 light hours from Earth now.
Neptune, mag 8, 4x larger & 17x heavier than Earth, 165Y orbit, 4h40m light time from Earth.

Bright Stars

Sirius, brightest star, Mag -1.1, only 8.6LY away, Dog Star, 2x size of Sun, 23x brighter
Capella, 6th brightest star, 0.05 mag, 45LY, red giant, 35x brighter than Sun
Aldebaran, Eye of the Bull, 13th brightest star, mag 0.86, red giant, 68LY, 40x larger than Sun, 125x brighter
Betelgeuse, Orion's shoulder, red supergiant, 590LY, 14,000x brighter than Sun, billion miles in diameter.
Would fill the solar system out to the orbit of Jupiter. May go supernova in next century.
Rigel, Orion's foot, 7th brightest star, 0.1 mag, 58,000x brighter than Sun, 900LY away
Procyon, "Nose of the Dog", 8th brightest star, 0.34 mag, 5th nearest visible star, 11.3LY, 6x brighter than Sun.
Castor, (upper twin), 23rd brightest star, 1.6 mag, 45LY, looks like a triple star, actually sextuple.
Pollux, (lower twin) 17th brightest star, 1.16 mag, 35LY, red giant, 35x brighter than Sun.

Interesting Stars (brightness of primary given for multiple stars)
Schedar, Alpha Cass, double star, sep. 0.74", optical double only, 230LY, orange-purple pair.
14 Aurigae, Triple Star, mag 5.1, yellow white and blue, sep. 14.6", 270LY, actually a quadruple star system.
41 Aurigae, Double Star, mag 6.3, white and lilac, sep 7.7", 310LY away.
TX Piscium (19 Psc), mag 4.8-5.2, variable red giant, Carbon Star, deep red to amber, 800LY

Star Clusters
Alpha Persei Moving Group, Open Cluster of yellow stars like Sun, in Perseus the Hero, 510LY
M41, Little Beehive in Canis Major, 1500LY away, ~26LY across.
Pleiades, M45, The Seven Sisters, open cluster of ~70 stars, 6 vis., in Taurus, 444LY
M103, open cluster, near delta Cass, mag 7.4, 15LY across, 9.2KLY away, "Christmas Tree Cluster"
M52, open cluster, follow line from alpha Cass to beta toward Ceph., mag 7, 15LY across, 3.9KLY away
Double Cluster, two open clusters NGC 869, 884, 7.2KLY and 7.5KLY away, formed from same cloud.
M48 Open cluster, ~500 stars, 2500LY away, 63LY across.
M35, Shoebuckle Cluster, 3000LY away, 11LY across, near ecliptic, often is seen with the Moon or planets.
M36, Rocking Chair Cluster, 4000LY away, 7LY across, about 200 members.
M37, 4500LY away, directly opposite the galactic center in sky, in next galactic arm out. 25LY across.
M38, Starfish Cluster, 3500LY away, 13LY across, Brightest star is a yellow star 900x brighter than Sun.
Hyades, second closest star cluster, 150LY away. Aldebaran is about 60LY away, and isn't part of the cluster.
M44, The Beehive Cluster, Cluster of yellow stars like the Sun in Cancer, 600LY away, 23LY across.
C73, NGC 1851 in Columba, mag 7.3, 40KLY away, globular cluster, once a nucleus of a dwarf galaxy.

Nebulas
M76, Little Dumbbell Neb., mag 10.1, 2500LY, Planetary Nebula, 1.2LY across, remains of a red giant star.
M42, Great Orion Nebula, mag 4, 1300LY, closest star formation region, 24LY across. youngest stars <30,000 years old. New stars still shrouded in gas and dust are there, as well as protoplanetary disks.

Galaxies
Andromeda Galaxy, M31, follow line from beta through mu, near nu., M32 and M110 in same low power field nucl.mag 6, 1 trillion stars, 150KLY across, 2.5MLY away, headed toward Milky Way, collides in 3-4BY
Triangulum Galaxy, M33, follow line from alpha Tri toward alpha Andr, about 1/3 of the way. Mag 5.7, 67'across dim nucleus, diffuse faint oval glow. 2.7MLY away, 60KLY across, 40B stars, 0.01 mass of Milky Way
NGC 1499

Objects for Imaging Scopes

These objects are extremely difficult to observe directly through visual scopes, and make unique targets for smart scopes and astrophotography setups.

NGC 6820 and 6823, Emission Nebula and Star Cluster in Vulpecula. Nebula is 40'x30', cluster is 12' in diameter. Use a nebula filter if your setup allows. Fairly bright (~mag. 8.1). 6000LY away.

NGC 2237, 2238, 2239, 2246 The Rosette Nebula, 80'x60', Emission Nebula in Monoceros the Unicorn, Use an H-alpha filter or nebula filter if possible. Customary designation for whole object is NGC 2237. NGC 2244 is a star cluster inside the nebula. 5000LY away, 130LY across.

NGC 281, Pac Man Nebula, Open cluster & Emission Nebula in Cass. 35'x30'. Use nebula filter or none. Bright, comes in rapdily. 9000LY away, 48LY across.

NGC 246, The Skull Nebula (aka Pac Man Nebula, sometimes), Emission Nebula in Cetus. Bright, comes in rapidly without filters. 1600LY away, 2.5LY in diameter.

NGC 1499, California Nebula, Emission Nebula in Perseus, 160'x40' comes in best with an H-alpha or Nebula filter. 1000LY away, the nebula is part of a shock wave of gas 22LY in diameter.

M78, Casper the Friendly Ghost Nebula, Reflection Nebula in Orion (use no filters.) Bright reflection nebula that begins to show rapidly. 1350LY away, 10LY across. Contains young stars only visible in infrared.

NGC 1333, Reflection Nebula in Perseus, 10'x8', use no filter. 1000LY away, has a Herbig-Haro object HH12 in its center.

B33 The Horsehead Nebula in Orion, one of the showpiece objects for smart telescopes, especially with the **Flame Nebula (NGC2024)** in the field of view for short FL scopes. The Horsehead is a dark nebula seen against the HII region IC 434. No filter, nebula filter, or H-alpha filter all work well here.

IC443, The Jellyfish Nebula, in Gemini, 43' diam. Nebula filters preferable, nebula shows in ~3 min. 5,000LY away, supernova remnant from 30,000 years ago. SN shockwave interacting with interstellar molecular clouds.

NGC 7023, The Iris Nebula, Reflection Nebula in Cepheus. 10'x8'. Use no filters. High surface brightness. 1300LY away, 3LY radius.

NGC 247, Galaxy in Cetus, 19'x6', Spiral with nice dust lanes, mottled core. 11.1 Million LY away. Gravitationally bound to the Sculptor Galaxy (NGC 253, below.)

NGC 253, C65, Sculptor Galaxy, 30'x7', magnificent spiral galaxy similar to ours, 8 Million LY away. Good detail. Shows as a galaxy in ~5 minutes, more detail in outer arms with more time.

M77, NGC 1065, Peculiar Seyfert Galaxy in Cetus. 8'x7', can be caught in the same field as NGC 1055, another spiral galaxy nearby. NGC 1065 is face-on and has a starlike nucleus and distinctive barred spiral arms. It has an active galactic nucleus. If you can position your scope manually, move it north and slightly east to place **NGC 1055**, about 30' away, in the field as well. NGC 1055 is an edge-on spiral with a prominent nucleus and a dark band across its arms.
NGC 1065 is 47 million light years away, and 90,000 light years across (barely smaller than the Milky Way.)
NGC 1055 is 52 million light years away, and 120,000 light years across (just bigger than the Milky Way.)

Binocular Objects

The following list of objects show well in binoculars. In some cases, they cover a wider field than is visible in most telescopes. In other cases, they are well seen with low power, or are things that provide a distinctive view in binoculars vs in other instruments.

Binoculars are also good for showing smaller objects in their broader context. Nearby stars that are parts of the constellation they are in can be seen in the same field as many objects, even if the objects themselves are only small fuzzy spots. This gives the public an idea of how amateur astronomers can find objects in the sky.

Also mention that the views we get from binoculars are very similar to the views from early telescopes like those of Galileo and Cassini. Aperture and magnification are similar. Modern binoculars give brighter images and much wider fields of view than the telescopes of the 15th and 16th centuries.

Jupiter & its moons: Jupiter's moons would be visible by eye, if it weren't for the bright glare of Jupiter hiding them. The modest magnification of binoculars separates them from Jupiter, and improves constrast to let us see them directly.

Saturn & Titan

M31, Andromeda Galaxy: Visible by eye in dark skies (that we don't have), the entire galaxy spans over six times the width of the full Moon in the sky, too wide for nearly all telescopes to see at once.

C41, The Hyades (face of Taurus, The Bull) Star cluster, possibly the closest star cluster to Earth (it's either #1 or #2.) Too wide for most telscope fields. 143 LY away.

M45, The Pleiades (the Seven Sisters), hard to see the full group in visual scopes. Barely fits into some smart scope fields. 444 LY away.

M42, Orion Nebula, the binocular view shows a more condensed, brighter nebula. Star forming region. The stars of the Trapezium are about 3000 years old. Closest star forming region to Earth.

C28, NGC 752, Open Cluster in Andromeda, mag. 5.7. Overlooked widely spread cluster. Best view in the wide field of binoculars.

NGC 2244, C50, Open cluster at the heart of the Rosette Nebula in Monoceros. The Rosette itself is unlikely to be visible under our low contrast skies (unless you have an excellent quality instrument at 20x or so).

Alpha Persei Moving Group (Melotte 20 or Perseus Moving Cluster),Mag ~1.2 (brightest star Mirfak), ~500-600 LY away.

M44, The Beehive Cluster (Praesepe) in Cancer,Mag ~3.7, ~600 LY away, spans ~1.5° (about 3 full Moon widths).

The Double Cluster in Perseus (NGC 869 & NGC 884),Mag ~4 (combined), ~7500 LY away, each ~30' across, fitting beautifully in a wide binocular field.

M35 (Shoebuckle Cluster or Foot of Gemini), Open cluster in Gemini, near Castor's foot (one of the Gemini twins). Mag ~5.1, about 3000 LY away, spans ~20-30' in the sky.

Auriga Clusters: M38 (Starfish Cluster) mag 6.4, M36 (Pinwheel Cluster) mag 6.0 , M37, mag 5.6.