ASTRONOMY CLUB 89 Yrs OF TULSA

OBSERVER

July 2026

Bringing Stars to the eyes of Tulsa since 1937

Editor – John Land

NGC 4567 & 4568 (Siamese Twins Galaxies)

by Don Bradford June 16 @ Astronomy Club Observatory

The galaxy twins are part of the Virgo cluster of galaxies. They are about 52 million light-years distant, while their bright cores appear separated by about 20,000 light-years. The elliptical galaxy on the right is NGC 4564

Don Bradford made this image with his Apertura 6" Ritchey-Chretien telescope and ZWO ASI294MM Pro monochrome camera on a ZWO AM5 mount.

Don took a series of twelve 5-minute RAW exposures. Don says the evening started off with good seeing but got progressively worse. On page 6 he illustrates how he managed to make this outstanding images from the individual raw images.

Follow Us on Social Media

Facebook https://www.facebook.com/AstronomyClubofTulsa
Instagram https://www.instagram.com/stories/tulsa.astronomyclub/
Website https://www.astrotulsa.com/

Stargazing Nights and Observatory Nights

Come enjoy an evening of star gazing at our observatory located in dark rural skies SW of Tulsa
Details, Times and Direction Maps are posted on our Website https://www.astrotulsa.com/events

Guest and member Observatory nights

FRIDAY July 10 - 7:45 PM Guest & Members Night

FRIDAY Aug 7 - 7:45 PM Guest & Members Night

Astronomy Club Members Nights

Our members are invited to come work on their observing goals, do some Astro imaging and share ideas.

Friday July 17 - 7:45 PM Members Observatory Night

Friday Aug 14 - 7:30 PM Members Observatory Night

If a Friday event must be cancelled due to weather, we will try on Saturday 30 minutes before sunset -
Always check the website for event updates

Mark your August calendars ! August 12 -- Perseid Meteor Shower
August 27 – Partial Lunar Eclipse

2026 ASTRONOMY CONFERENCES and STAR PARTIES

Are you looking for a way to combine a bit of vacation time and enjoy learning more about astronomy? A regional or national astronomy conference may be just the thing for you. You can make friends with like-minded astronomy enthusiasts and also get to hear some interesting presentations on a variety of topics. The door prize giveaways are also an extra little bonus.

31st Annual Nebraska Star Party - July 12 -17

https://www.nebraskastarparty.org/

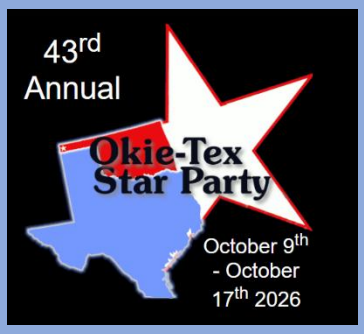
Experience the breathtaking beauty of the night sky at Merritt Reservoir in the Nebraska Sand hills. Merritt Reservoir State Recreation Area (SRA) is certified as an International Dark Sky Park.

Enjoy a variety of recreational activities including swimming, tubing and boating. We also have a beginner field school and astronomy activities for kids

ALCON2026.org

National Astronomical League convention Aug 12 -15

The ALCON 2026 will be located in Cincinnati, OH. Details are still in development but you can save the website https://www.alcon2026.org/ and register for emailed updates. See an Overview starts About 8 mins in to YouTube – AL 80th anniversary https://youtu.be/G2-tzvtob74?t=500



Okie-Tex Star Party Oct 9 – 17 https://www.okie-tex.com/index.php

Several of our Tulsa area astronomers enjoy going to the Okie-Tex Star Party in the autumn. Each year about 500 astronomers arrive from all over the nation for a week-long feast of starlight. Okie-Tex is held on a spacious observing area just west of the Black Mesa State Park at the far western end of the Oklahoma Panhandle. Its bortle 1 dark skies are acclaimed as some of the darkest on the planet. Each time I go I am overwhelmed by the late summer Milky Way flowing overhead like a river of stars engulfing the sky. You need to register and reserve your meal choices BEFORE August 31, 2025

There are other extended Star Party events around the country. So, look for developing news in your Astronomical League quarterly newsletter *The Reflector*, Astronomy Periodicals or search online.

Club members, both near and far, hello!

I trust that now we're officially past the Summer Solstice; you're all already putting together your fall observing lists... (I'm kidding, of course.) In all seriousness, I do hope the longer days have still allowed you to sneak in some decent observing whenever Oklahoma decides to cooperate. As for this astronomer, I only ever seem to catch the night sky during the brief moments when it isn't trying to flood the entire state.

Even so, the weather hasn't slowed our club down one bit.

As I write this message, I'm coming to you from St. Charles, Missouri, where this year's Mid-States Region Astronomical League (MSRAL) Convention is taking place. The Astronomical Society of Eastern Missouri has done an outstanding job selecting venues, organizing speakers, and making attendees feel right at home. It's been a wonderful opportunity to connect with fellow amateur and professional astronomers from across the region while representing the Astronomy Club of Tulsa on a broader stage.

This year's convention welcomed well over 100 attendees, making it a fantastic gathering of curious minds, experienced observers, educators, and lifelong learners. One of my favorite aspects of events like these is the reminder that, regardless of where we call home, we're all united by the same simple desire: to better understand the universe above us. I'm already looking forward to seeing what next year's convention has in store.

Back here at home, we've continued making steady progress on restoring our observatory dome. Over the past month, volunteers have spent several workdays scrubbing away years of flaking paint, removing old dirt-dauber nests, and testing different cleaning methods on the interior surfaces in preparation for repainting. While the work may seem small in the grand scheme of things, the transformation is already noticeable. With each workday, our observatory feels a little brighter, a little cleaner, and a little more ready for the next generation of astronomers who will walk through its doors.

I want to extend a sincere thank you to everyone who has volunteered their time, energy, and elbow grease to help breathe new life into one of our club's most treasured resources. Your efforts are making a real difference.

As always, be sure to keep an eye on our website and social media pages for upcoming meetings, outreach opportunities, guest nights, and special events. Summer may be hot, but it's also one of our busiest and most rewarding seasons as we continue sharing the night sky with the Tulsa community.

Until next time, this is Jonathan Fussell, currently somewhere between a fresh coat of paint and a fresh cup of coffee, reminding you that the universe is always worth looking up for.

Clear skies, everyone

President Jonathan Fussell,

Astronomy Club of Tulsa -

"Bringing Stars to the Eyes of Tulsa since 1937"

Click on these images to links on the Internet

Tulsa National Weather Service

*** The NEW **CLEAR OUTSIDE** icon above is a link to an extensive site showing cloud cover %, Seeing, Transparency, Moon Phase, Temp in ^{O} C and many other useful tools

GOT A NEW TELESCOPE? Here are some sites to help you get started with you telescope.

Getting Started with Your New Telescope
https://skyandtelescope.org/astronomy-news/getting-started-with-your-new-telescope-2/

Astronomy for Beginners | Night Sky Facts, FAQs & Resources
https://skyandtelescope.org/astronomy-information/

What to Know Before Buying a Telescope
https://skyandtelescope.org/astronomy-news/what-to-know-before-buying-a-telescope/

See Website Observation Station for a collection of Interactive Sky Watching Tools
Moon phases - Sun rise & Set - Make your own custom interactive sky chart and more
Great website for printable Finder Charts of Solar System objects https://in-the-sky.org/

Astronomy Calendar 2026: All Major Celestial Events of the Year

Explore a Month-by-Month listing of Celestial Events – Many have links to Details or Videos

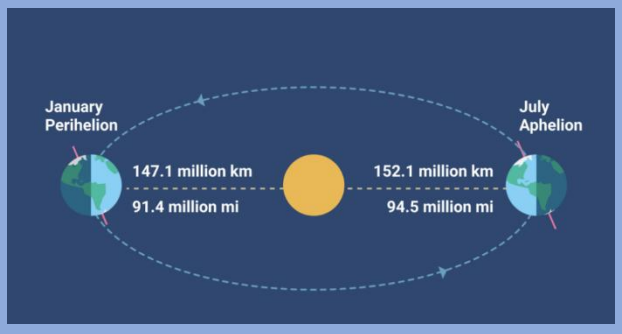
Daily Moon Guide | Observe – Moon: NASA Science

July - Moon Phases - -
3rd Q - - Tues July 07 - - New Tue July 14 -- 1st Q Tues July 21 Full Weds July 29

Lunar conjunctions – Before Dawn Saturn - Neptune Tues Tues July 7
Mars Sat July 11 , Evening Jupiter July 14 Venus Fri July 17

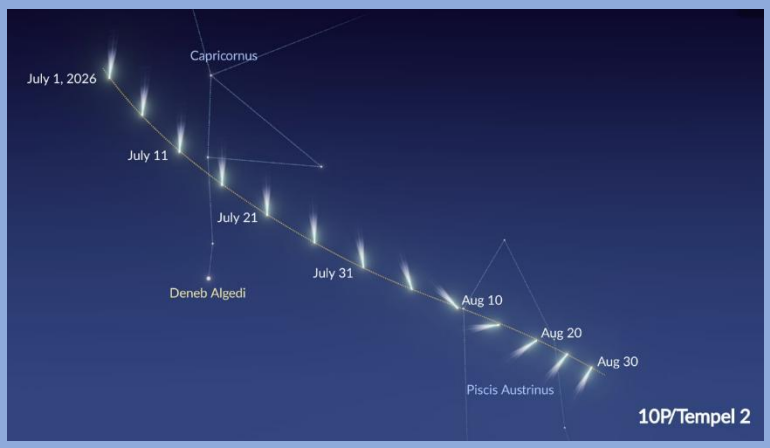
During June we enjoyed a close conjunction of Venus and Jupiter in the constellation of Gemini. In July Venus will be passing through Leo. Venus passes within 2 degrees of Regulus on July 8th. Jupiter will soon be swallowed up in the evening twilight. It reaches superior conjunction with the sun on July 29.

Weds July 29th's Full Moon is called the BUCK MOON. The Full Buck Moon takes its name from the time of year when antlers start to appear on male deer (bucks).



Summer officially began with the Summer Solstice on June 21st. Temperatures are regularly hitting 90's and soon to be 100's. Ironically the Earth is farthest from the Sun (Aphelion) on July 6th at 94,502,962 miles. – 1,547,155 miles farther than average. Earth was actually closest to the Sun on January 3rd. In July the Northern Hemisphere is tilted toward the sun resulting in more hours of daylight thus more solar heating. The opposite is true in the Southern Hemisphere where they are enjoying winter. Learn more at Perihelion vs Aphelion.

Explore Astronomical League has a wide variety of Observing Certificate Programs



Periodic Comet 10P/Tempel 2 reaches perihelion on Aug 2 and is closest to earth on Aug 3. During the new moon period of mid-July it rises in Capricornus in the SE about 22:08 hrs and transits at 03:23. Current observations place it at about 10.5 mag. Its orbit carries in further south so plan to observe it while we can. For more up to date observations and details go to.
https://astro.vanbuitenen.nl/comet/10

Don Bradford – Gives details about his image of NCG 4568n on the cover. He took a total of 12 frames, each at 5 min exposure. The night which started out with good transparency but ended with almost overcast thin clouds. These two raw, unprocessed images demonstrate the deterioration in conditions from the #3 image (best) to the #11 image (worst). Image #12 was so bad it had to be discarded.
However, by processing with PixInsight using its Weighted Batch PreProcessing script, the images could be stacked with the better images given the highest weight while taking some advantage of all the images' contributions to the target subject. Using other PixInsight post processing scripts (BlurXterminator, NoiseXterminator, and Multiscale Adaptive Stretch), Don obtained a reasonable processed image in spite of the relatively poor raw images.

Image 3 Good **Raw Images** **Image 11 Poor**

Final Processed Image – See cover for full scale image

June Astronomy Club Activities

On Saturday June 20 about 30 members gathered for a Summer Solstice Ice Cream and Cookies Celebration at Case Community Center in Sand Springs. We enjoyed a good time visiting and getting better acquainted.

Afterwards we set up several telescopes outside for a well-attended public telescope viewing evening. Guests enjoyed seeing the first quarter moon, Venus, Jupiter as well as other sights. Scott Bratt reports the pictures he posted on the club Facebook had 13,000 views and picked up 50 new followers.

Aliosha Hand **Kacy Luker** **Don Hamilton**

Astronomy Outreach at Camp Strong

On Weds 6/10 the BA Sidewalk Astronomers and Astronomy Club of Tulsa were invited to Shepherds Fold Ranch at the Camp Strong event near Avant, OK . Peggy and Rick Walker from BA Sidewalk Astronomers were joined by Astronomy Club of Tulsa members Tim Gilliland, Kacy Luker and Matt Sloan to set up telescopes. Peggy enjoyed showing the youth how to use binoculars for viewing Venus and Jupiter and explaining about those planets. Tim had long lines eager to look through his big telescope at sights like the globular cluster M 13. Kacy and Matt also shared views through their telescopes. The roughly 75 young people and councilors seemed to enjoy the views very much giving very positive feedback.

Camp STRONG St Francis is an annual specialized summer camp for children with oncology and cardiac medical histories, along with their siblings. The 2026 theme was ***'Out of this World'*** space exploration, featuring rocket launches, astronaut training, alien hunts, swimming, archery, canoeing, kayaking, hiking, water games, tie-dye, group skits, flashlight games, a Hopes & Dreams ceremony, and a night swim.

Learn more at **https://www.saintfrancis.com/childrens/child-life/camp-strong**



Workdays on the Observatory Dome

In 2027 we will be celebrating the 90th birthday of the Astronomy Club of Tulsa since its formation in 1937. This month several members of the club have been working on restoring the interior surfaces of the observatory dome. Observatory construction was begun in 1992. The dome is a 20-ft diameter is the top of a modified grain silo. The plan is to remove loose paint and mud-dauber wasp nests then clean and repaint the interior with a fresh coat of durable paint. We will also be doing some other repairs and upgrades to ensure the observatory continues to be an attractive place to continue –

"Bringing Stars to the Eyes of many New Generations of Tulsans"



Rocky Mountain Star Stare 2026 by Scott Bratt

The Rocky Mountain Star Stare star party was held June 10th – 13th this year at the Colorado Springs Astronomical Society's 35-acre club owned facility near Gardner, CO. The site is located at 7,600 feet altitude between the larger mountain ranges to the north and south and provides for some beautiful scenery of the Colorado Rockies.

Kit and I went this year (again) because last year was such an enjoyable and rewarding event. The skies there are much clearer and brighter than we have at home (Bortle 2 vs Bortle 5) and it is a much-welcome retreat from the heat. The trip driving there is about 10.5 to 11 hours each way from Sand Springs pulling a small camper passing through the panhandle of Oklahoma. Coincidentally we pass within about 30 miles of the Okie-TEX site on our way.

We arrived a few days early (membership privileges) and found a nice spot to set up camp with a great view of the night sky in all directions. As a member of the CSAS club I offered to volunteer myself as needed for duties around the event and was asked to work the front gate for a couple of shifts, greeting and guiding guests into the facility for registration and directions around the facility for camping. The weather the first two days there was a bit windy and cloudy early but both subsided after midnight and provided for some clear skies for stargazing. The rest of the week the weather was cloudy during the daytime hours, and by the twilight hours the clouds that were still visible began to magically evaporate into crystal clear skies. Anyone who has been to the Rocky Mountains will recall that during the "monsoon season" that typically the weather during the day starts clear, clouds build, and you might get a passing rain or sprinkles with the more severe weather beginning along the front range. The heating and cooling of the valleys between the mountains creates a predictable pattern of winds mid-morning and again just before sunset where you get a few gusts of wind for a period of a half hour or so. The daytime temps were in the low 80's but one day the temperature only reached 73 degrees, and the low the night before that got down to the mid-40's. Most early morning lows were in the upper 50's to low 60's, very pleasant compared to our Oklahoma weather!

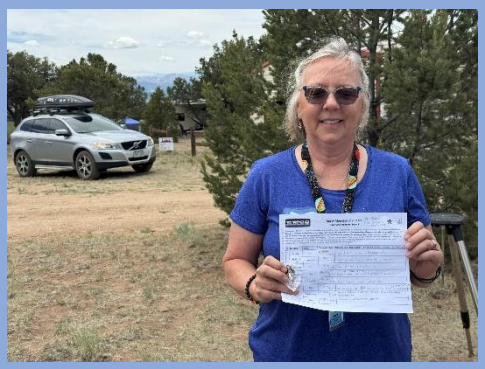
This year the attendance seemed to be a bit off from last but still a very large crowd. There were not quite as many children this time but a good crowd of families with smaller children. This event has been known as a family-friendly event with lots of activities throughout the day geared for the younger kids. There are also several board games set up in the town hall to help the teens stay occupied and entertained.

They also have guest speakers making daily astronomy related presentations. This year's presenters gave programs on a variety of topics including "Catching Astronauts: Recovery of the Crew of Artemis II", "The Science of Amateur Spectroscopy", "The Pleiades: Seven Daughters of Pleione", and "NASA's PUNCH Mission". There was even a young 12-year-old lady who made a great presentation on "Space Toilets". I think it was a science fair project she did at her school. The interesting thing about this club and most of the presenters is that being based in Colorado Springs, there are a large number of members actively serving in or retired from the Air Force. There are also government workers and scientists who work on various aspects of astronomy related fields for the Air Force, NASA, and NOAA (Denver area).

At dusk every evening there is a night sky tour that is popular with new guests and those who are not familiar with the night skies. It is very similar to the program our own John Land puts on at the observatory, describing the first stars that begin to show as darkness arrives, the constellations and asterisms as they

become visible, and other interesting facts and what other cultures throughout history have described what we see today.

Another great feature is the Observer Programs created specifically for the RMSS event by the club Astronomical League coordinator. Level 1 is a very basic list of stars, asterisms, constellations, and some easy naked-eye and binocular targets. You have to make an observation and include the date, time, and a sketch or comments about what you saw. The night sky tour focuses on these objects to give the less experienced the opportunity to easily find the objects. Level 2 is a bit more advanced that requires binoculars or a small telescope to complete and includes many of the brighter Messier objects, galaxies, double stars, and globular clusters, and is not really mentioned much in the night sky tour. Level 3 adds to the difficulty by adding objects that will require a larger aperture telescope to see, such as galaxy clusters, double-double stars, and objects such as Barnard 86 Ink Spot Nebula, and NGC 6826 – The Blinking Nebula, and the complete Veil Nebula system. With each level the participant has to fill out the "log sheet" with the required information then presents it to the AL coordinator and answers a few simple questions about the observing sessions. He then looks over the paperwork and presents you with a corresponding lapel pin and gives you back your log sheet to keep for your records or add to your own logbook. It's a great activity to get you into the searching and logging of your work in astronomy. This program introduces you to the more formal and complex observing programs offered by the Astronomical League on their website.



With skies clear most nights Kit and I both got some pretty good images with the Seestars, along with some great visual work on objects like the Blinking Nebula and the Ink Spot Nebula, and many galaxies and star clusters. A funny note about the Blinking Nebula, I looked and looked at that thing and wondered why it was named that until I changed my focus to another object in the field of view and it blinked! I looked back at it, and it just sat there shining normally and when I glanced over again to the other star it faded out again. Repeat, look away and there it was, blinking out in my averted vision when I looked away! I don't know the reason it does this but it was pretty neat to see for myself. I have looked at it before and never noticed this effect but this time I saw it!!!

All in all, a great week away in the mountains with a great group of people who share the love of the night sky. We are looking forward to Okie-TEX this fall, but I will be going back again to the Rocky Mountain Star Stare next June!

Scott won the Artemis II NASA "Space Medicine Operations Division Patch" from Camp Pendleton Chief Surgeon Matt Bidlack.


Seestar S50
M 101
105° W, 37° N / 2026.06.10 22:57
21min


Seestar S50
NGC 5905
105° W, 37° N / 2026.06.13 01:00
35min


Seestar S50
Sadr
35min


Seestar S50
NGC 4038
66min

What Kind of Star Group Is That?

"It's funny. All you have to do is say something nobody understands, and they'll do practically anything you want them to."
-J.D. Salinger, Catcher in the Rye"

Many of the stars we see at night appear in groups. The type of group depends on the number of stars involved and how they physically relate to each other. I've noticed questions at outreach events asking us to explain the workings of different star groups. Sometimes, it is difficult to explain this beautiful, but complicated type of object to an audience with a general knowledge of astronomy. The idea for this question came to me from my wife; Harriet asked me to explain the difference between open and globular clusters and thinking of that response led to this article.

Let's look first at multiple stars, i.e., star systems with two or more members as we see it. This is an important point; multiple stars may not be near each other in space but look like they are. Study of their motion will determine if all the stars are gravitationally bound (attracted to each other by gravity) or not. Many stars that seem multiple are in fact chance alignments. The opposite situation exists; all but two of the stars of the Big Dipper move together in space and indicate an old cluster that has slowly dispersed. True multiple stars that are bound can be considered a small open cluster, and in fact, the boundary between a multiple star and a cluster is not rigid.

Another confusing type of star group is an asterism. Many are small and contain many stars, but are not clusters, whereas others are large and are a cluster. The Pleadies and Beehive are a true cluster, but the Head of Hydra is just a chance alignment. The way to determine if what appears to be cluster is to study it in a professional setting and determine how it was formed.

Open Clusters

"Can you bind the chains of the Pleiades? Can you loosen Orion's belt?", Job 38:31

Open clusters are all thought to form approximately the same way. It is highly unlikely that several stars would come together and coagulate so to speak into a star cluster. It is much more likely that a existing dust cloud that is disturbed will collapse into a cluster of young stars. The famous Pillars of Creation in the Eagle Nebula are a good example of this stage of star formation. Once most of the cloud has collapsed into stars, the cluster will begin to look like the normal version of one. There may still be significant wisps of dust and extra material surrounding the stars but for the most part that has been used or has dispersed. We begin to see now the stars formed in the process. The Pleiades and the Hyades near it in Taurus are great examples of open star clusters. The Pleiades are younger and therefore remain close to each other relatively in space. The Hyades have had more time to disperse and have moved away from their origin point.

This is typical behavior of an open star cluster - it begins small, concentrated and with some dust or other nebulosity still detectable - and slowly but surely it begins to move apart look to be entirely stars. One of the determining factors in assigning a group as an Open Cluster, in fact, is that the stars involved formed near each other in space originally, and at about the same time. Another clue is its location in its host

galaxy, with open clusters primarily forming in the main body where dust and nebulosity is more prevalent, i.e. there is more material to build stars with at hand.

Classification of Open Clusters

Robert Julius Trumpler (1886-1956) was a Swiss born, American astronomer. He introduced the term Galactic Clusters in 1925, in the work leading to his classification system, which is the most used means of identifying OCs today. He created, in 1930, a table of 37 Open Clusters that are now known as the Trumpler Catalog, providing examples of his system.

The Trumpler system requires the observer to specify three features of the open cluster:

- degree of concentration
- the range of brightness (magnitude) of the stars in the cluster
- number of stars in the cluster.

Degree of Concentration

I. Detached clusters with strong central concentration
II. Detached clusters with little central concentration
III. Detached cluster with no noticeable concentration
IV. Clusters not well detached, but have a strong field concentration

Range of Brightness

1. Most of the cluster stars have nearly the same apparent brightness
2. A medium range of brightness between the stars in the cluster
3. Cluster is composed of bright and faint stars

Number of Stars in the Cluster

P Poor clusters with less than 50 stars
M Medium rich cluster with 50-100 stars
R Rich clusters with over 100 stars

The Trumpler system denotes open clusters with any type of nebulosity (including light and dark nebula) with an "n" at the end of the classification. For example, a nebula surrounds the open cluster NGC 3293; therefore, the Trumpler classification for NGC 3293 is I3rn.

Globular Star Clusters

"Every passing hour brings the Solar System forty-three thousand miles closer to Globular Cluster M13 in Hercules — and still there are some misfits who insist that there is no such thing as progress.", Kurt Vonnegut, The Sirens of Titan.

The formation of globular star clusters is not perfectly known but it is a fact that they tend to form a halo around the center of the Galaxy and are not found only in the main plane or disc of the Galaxy. Originally, astronomers thought that this pointed to a different method of formation, a more ancient one, with the globular clusters forming early in the days of their galaxy, and becoming isolated, with old stars, and little interaction with the main galaxy, other than to orbit it over millions of years.

However, globulars have been found to contain stars formed at many different times. They also have some characteristics of dwarf spheroidal galaxies and may have been captured by their host. All known types of galaxies have globulars. Interacting galaxies have stripped away some of the globulars in the smaller one, creating intragalactic globulars that reside between galaxies in deep space. We have much to learn about these fascinating objects.

Classification of Globular Clusters

A globular cluster is a spherical collection of stars that orbits a galactic core much like a satellite. In a globular cluster, gravity tightly binds the stars together, which gives the cluster its spherical shape and relatively high stellar density toward the centers. From 1927 through 1929, Harlow Shapley and Helen Sawyer began categorizing clusters according to the degree of stellar density or concentration the system

exhibits and established the Shapley-Sawyer Globular Cluster Concentration classification system. The basic scheme is the following:

Class	Description
I	High concentration toward the center
II	Dense central condensation
III	Strong inner core of stars
IV	Intermediate rich concentrations
V-VII	Intermediate concentrations
VIII	Rather loosely concentrated towards the center
IX	Loose towards the center
X	Loose
XI	Very loose towards the center
XII	Almost no concentration towards the center

Determining Which You See

Most of the time, it is easy to differentiate between open and globular clusters. Their appearances are usually quite different, with open clusters containing fewer stars, located close to or within the Milky Way, and a looser shape. It gets complicated at the edges of the classifications. For instance, determine whether these are an open or globular cluster.

Answers at end of article…

More Cluster Fun

The Astronomical League has observing program for both types of clusters, and even has programs for observing asterisms, constellations, constellations of other cultures, and three programs dedicated to multiple stars. Most have an imaging version, also. If you have any questions about this article or the observing programs, let me know in person or via hafsnt1@gmail.com

Answer to cluster quiz: NGC 5466 on left is a globular cluster. NGC 2516 on right is an open cluster.

Sources: All images are public domain (Hubble)

J. Ruprecht, "Classification of Open Star Clusters", Astronomical Institute of the Czechoslovak Academy of Sciences, Praha. Aug 25, 1965.

Harlow Shapley, 1930. "Star Clusters". Harvard Observatory Monographs, No. 2. New York, 1930. Ch. II.5, pp. 11-14.

Jeff Burton, "Shapley–Sawyer Globular Cluster Concentration Class". Archive.org retrieved 6/19/2026

Edward Dugan III, "What is the difference between a globular star cluster and an open star cluster?" *Astronomy,* June 2019

Mike A. Hotka, Guide to the Globular Cluster Observing Club, Astronomical League, 2004.

Bejamin Jones, Open Star Clusters: A Selection of 125 Open Star Clusters, Astronomical League, 2005.

What's the Difference Between 'Mostly Sunny' and 'Partly Cloudy' ?

https://commonplacefacts.com/2025/01/05/mostly-sunny-partly-cloudy-difference/

As astronomers looking forward to an evening of observing, we check the local weather forecasts and other resources to estimate our opportunity of success. Unfortunately, the terminology is often confusing. This article details how the meteorologists of the NOAA make their judgments for the forecasts. You'll want to read the whole article but here are the details.

Meteorologists use a unit called an OKTA to describe cloud cover. It represents one-eighth of the sky. The number of opaque oktas are the portions of the sky covered by clouds you can't see through. For nighttime forecasts, "partly cloudy" is used instead of "partly sunny"

Daytime Forecast Term	Cloud Coverage
Sunny	0/8 opaque clouds
Mostly Sunny	1/8 – 2/8 opaque clouds
Partly Sunny	3/8 – 5/8 opaque clouds
Mostly Cloudy	6/8 – 7/8 opaque clouds
Cloudy	8/8 opaque clouds

The probability of precipitation or storms is also based on percentages.

Chance of Precipitation	Expression of Uncertainty	Area Qualifier
0%	None	None
10%	Slight chance	Isolated, few
20%	Slight chance	Widely scattered
30-50%	Chance	Scattered
60-70%	Likely	Numerous
80-100%	None	None

Treasurer Report
Cathy Grounds

As of June 27, 2026, we have 160 members with 32 new members this year.
Please welcome new members Richard Knecht, Ryan Todd, Esther Jones, John Evans, Angelus Brick and are also glad welcome back Peggy and Rick Walker from the BA Sidewalk Astronomers

Since our June newsletter 32 people have sent email contacts via our website about club events, meetings or other topics.

FAQ: How do I know when to pay my dues? You will receive a notice by email when it is time to renew your membership. Look for it on or around the 1st of the month in which your membership expires. If you are not sure just check with the treasurer.

Don't forget these easy methods to Join or Renew your membership:
https://www.astrotulsa.com/join – see the "join" tab at the upper right

1. **PayPal (click "join/renew" on the website) and follow the prompts, there is small fee.**
2. **Mail in a check or money order to Astronomy Club of Tulsa, PO Box 470611, Tulsa, OK 74147.**
3. **Direct your bank's bill pay service to send payment to our PO Box address above.**
4. **Pay cash at any club event or swipe a credit card (there is roughly a 3% service charge).**

As always if you have any questions or concerns or if your email, phone, or mailing address has changed please email me at: AstroTulsa.Tres@gmail.com

Membership rates for 2025-2026 are as follows: All include an Astronomical League Membership and you will receive their magazine *The Reflector* each quarter.
Adults: $50 per year
Sr Adult: $40 per year (65 or older).
Students: $40 per year
Additional Family membership: $30 including voting rights.

The regular membership allows all members in the family to participate in club events but only ONE Voting Membership and one Astronomical League membership.

Magazine Subscriptions- You can see subscription info on the "Join" tab at www.astrotulsa.com.

You can get a discount rate as an Astronomy Club member.
However, you will need to do so directly using their discount rate web links.
Both have options for DIGITAL as well as PRINT subscriptions.

To learn about Sky and Telescope magazine see their home page
Digital $ 37.05 Print & Digital $ 45.75 includes a $ 10 club discount
Use this **Sky & Telescope Subscription Link**

To learn about Astronomy magazine see their home page
Use this **Astronomy Subscription Link** **Digital $ 39.95 Print & Digital $ 49.95** no club discount

You are invited to join us to learn more about Astronomy and view the wonderful sights in the night sky.

Check the EVENTS section at https://www.astrotulsa.com/

ASTRONOMY CLUB OBSERVATORY
Located on a hilltop about 25 miles SW of Tulsa
Features: classroom, restroom, dome with 14-inch telescope and an acre to set up your telescopes.

Weather permitting, we host two types of observing nights.

GUEST OBSERVING NIGHT – RSVP requested
This event is open to our Guests – both individuals and families as well as our regular members. Several of our club members set up telescopes for public viewing.
* Groups need to make separate arrangements.

MEMBERS OBSERVING NIGHT usually on a Friday near new moon
Reserved for club members and their families to allow them to pursue observing projects.
The Observatory is ONLY OPEN for SCHEDULED EVENTS.

Check the EVENTS section at https://www.astrotulsa.com/
Follow our map directions DO NOT USE GPS

Two Options for travel to the observatory

MOSTLY PAVED ROADS – Hwy 75 to 201st St S – through Mounds OK

Most DIRECT ROUTE – Hwy 75 to 241st St S – some coarse gravel & dirt roads

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Our Monthly in town club meetings will resume in the Fall.

Due to the closing of the Jenks Planetarium to public events, we are exploring other options for our meeting location. The New Location and Times will be posted once we have details.

ASTRONOMY CLUB OFFICERS:

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Use the club CONTACT PAGE
To Send a Message to any of the officers or board members or click the CONTACT tab on the top of our website

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GIBSON BRASEL
SCOTT BRATT
JERRY CASSITY
BRYAN KYLE
JOHN LAND
JACK REEDER
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