OBSERVER

December 2026

Bringing Stars to the eyes of Tulsa since 1937

Editor – John Land





We enjoyed a great time at our Nov 7th Annual Members and Family Dinner renewing friendships and forming new ones. We also enjoyed great food and service at new location -- Oklahoma Joes on 61st St

Our president Jonathan discussed some goals for the club's 90th birthday next year and looking forward toward the club's future.

He presented "Rising Star" awards to Richard Foster and Aliosha Hand for volunteering at club events.



Download your own 2026 Astronomy Club Group Picture

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Friday Dec 18 – 7:00 PM – doors open at 6:30
TULSA ASTRONOMY CLUB meeting at our NEW location
Tulsa Air and Space Museum's Planetarium
Located on north side of the airport
3624 N 74th East Ave, Tulsa, OK 74115



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

SATURDAY Dec 5 - - 4:30 PM CST Guest & Members Night

SATURDAY Jan 16 - 5:00 PM CST 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.

Saturday Dec 12 - 4:30 PM CST Members Night plus Geminid Meteor Shower

Friday Jan 8 - 5:00 PM CST 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

Check out these and future events on our website Events Section



Surely, you have noticed the EARLY SUNSETS now that we are back on Standard Time. Our Earliest Sunset occurs on Dec 5th at 5:11 PM The shortest daylight hours don't occur until the Winter Solstice on Dec 21 with only 9 hrs 47 mins. Sunset on the 21st is 5:16 PM but the date of the Latest Sunrise doesn't occur until about Jan 4th at 7:35 AM If we had stayed on Daylight time Sunrise would have been at 8:35 AM here in Tulsa and 8:52 in Guymon, OK

This image shows the Sun's position in the sky taken at a fixed time throughout the year. It is highest in the summer and lowest on the winter. But it also shows that the sun is 16 min 33 sec faster than average on Nov 3rd and 14 min 6 sec slower on Feb. 11th This figure 8 pattern is called the Analemma
For a Navigator to determine their longitude accurately by the sun they had to know the Equation of Time that showed how fast or slow the sun transits on any particular day.

Follow Us on Social Media

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



We are pleased to announce Dr. Racine Cleveland as our guest scientist speaker at our Friday Dec. 18th Astronomy Club meeting

Dr. Racine is a native Oklahoman from Prague, OK.
She is a planetary scientist, educator, and science communicator. She is currently a Planetary Science Postdoctoral Research Fellow at Boise State University. She earned her PhD in Space and Planetary Science and MS in Geography from the University of Arkansas and her BS in Geography from Oklahoma State University.

Her research explores the processes that shape planetary surfaces and atmospheres across Mars, Titan, and Earth. On Mars she used high-resolution HiRISE imagery to measure changes on the South Polar Residual Cap. On Saturn's moon Titan she studied radar observations of dune fields and compared them with terrestrial analogs. Her current research focuses on terrestrial and Martian dust devils, combining field observations, environmental sensor networks, and Mars 2020 mission data to investigate surface–atmosphere interactions.



Salutations all,

As we approach the end of another year, I want to take a moment to wish everyone a wonderful holiday season and an early Happy New Year! It's hard to believe that the next time we send out a President's message, we'll officially be welcoming 2027. And with that comes an exciting milestone for the Astronomy Club of Tulsa: our 90th anniversary!

Looking back, November was a wonderful reminder of what makes this organization so special. Our 89th Annual Club Dinner was a great success, bringing members together to celebrate another year of astronomy, friendship, and progress. During the evening, I shared an analogy involving a puzzle. I had assembled part of a puzzle frame and invited members to take the remaining pieces home as a reminder that every person plays a role in building the bigger picture of this club.

I truly believe that. Whether you're volunteering at an outreach event, helping maintain the observatory, sharing your knowledge with a new member, or simply showing up and supporting our activities, every contribution matters. The Astronomy Club of Tulsa wasn't built by any one person, and its future won't be either. It's the collective effort of our membership that makes everything we do possible. Thank you to everyone who continues to give their time, energy, and passion to this organization.

Speaking of building our future, our observatory renovation and telescope project continues to make progress! Donations toward the new telescope and ongoing observatory improvements are still being accepted, and every contribution helps us move closer to our goals.

As of this writing, the large Meade telescope has officially been removed from the dome! With the old equipment out of the way, our team is now taking a closer look at the pier and mounting system to ensure everything is properly evaluated and prepared for the installation of our new PlaneWave telescope.

This is a substantial project, and one that requires a great deal of precision, planning, and patience. There are plenty of engineering details to work through before we can safely install and operate the new system. Thankfully, we have an incredible group of volunteers and technical minds who have taken this project head-on. I have every confidence that we're in good hands, and I'll continue keeping everyone updated as we move through each phase. I'm looking forward to the day I can finally share those words we've all been waiting for: Success, we're ready for first light!

Looking ahead to December, we're excited to welcome Dr. Racine Cleveland, a planetary scientist and postdoctoral research fellow at Boise State University. Dr. Cleveland will be sharing her work on Martian dust storms and planetary surface processes, along with insights into NASA's upcoming Dragonfly mission to Saturn's moon, Titan. This is a fantastic opportunity to learn more about current planetary science research and the exciting missions shaping the future of exploration. I hope you'll join us!

Finally, keep an eye out for our upcoming 2027 club calendar. We've got more Astronomy on Tap events, observatory Guest Nights, workshops, outreach opportunities, and ways to get involved than ever before. We're also beginning to look toward our 90th anniversary celebrations, and I couldn't be more excited about what we're planning. As we enter this next chapter, I hope you'll find an opportunity to get involved, meet fellow members, share your interests, and help us continue growing.

The last 90 years built the foundation. The next 90 are ours to build.

- If you would like to help plan our club's 90th Year celebration –
- Contact Jonathan at **astrotulsa.pres@ gmail.com**

On behalf of the Astronomy Club of Tulsa, I wish you and your families a safe, happy, and wonderful holiday season. Thank you for being part of this organization, and here's to an incredible 2027!

Clear Skies ! Keep looking up, keep wondering, and I'll see you under the stars.

President Jonathan Fussell,

Astronomy Club of Tulsa - "Bringing Stars to the Eyes of Tulsa since 1937"

At our November Board meeting we approved this proposed Schedule for 2027

** NOTE: Some dates are awaiting confirmation – so check our events calendar later

January

- January 8 – Members Night
- January 15 – Hunter Park
- January 16 – Guest Night
- January 21 – Astronomy on Tap (confirmed)
- January 22 – TASM Club Meeting

February

- February 5 – Members Night
- February 19 – TASM Club Meeting
- February 27 – TASM Telescope Workshop in AM / Guest Observatory Night – PM

A day for new or Novice telescope owners to get one on one help with their telescope.

Awaiting TASM date confirmation

March

- March 5 – Members Night (see scheduling consideration below)
- March 6 – Messier Marathon – Potluck notification
- March 13 – Guest Night
- March 18 – Astronomy on Tap (confirmed)
- March 19 – TASM Club Meeting

Clickable Hyperlink Images
CHECK OUT OUR NEW SELECTION OF ONLINE SKY LINKS ABOVE

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

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

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

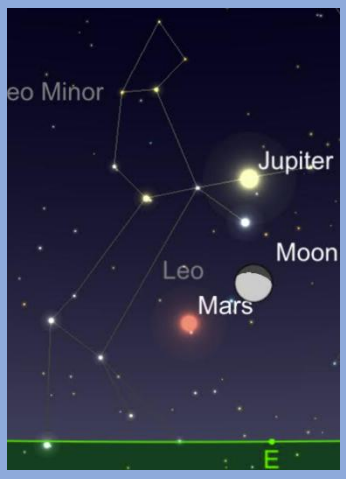
Astronomy for Beginners | Night Sky Facts, FAQs & Resources
https://skyandtelescope.org/astronomy-information/

What to Know Before Buying a Telescope **A collection of Interactive Sky Watching Tools**

Explore Astronomical League has a wide variety of Observing Certificate Programs

DECEMBER - Moon Phases - -
New Tues Dec 8 - 1st Q Weds Dec 16
Full Weds Dec 23 - 3rd Q Weds Dec 30

Lunar conjunctions –
Before Dawn Sat Dec 5 - Venus 8 ^{O} above Moon
Mon Dec 7 Thin Crescent near Mercury
Evening Thurs Dec 17 - both Saturn and Neptune in Pisces.
Sunday Dec 27 look for Jupiter – Waning Gibbous moon & Mars rising in a line by 22:215 rising in the east.



Try in-the-sky.org for finder charts of the planets.



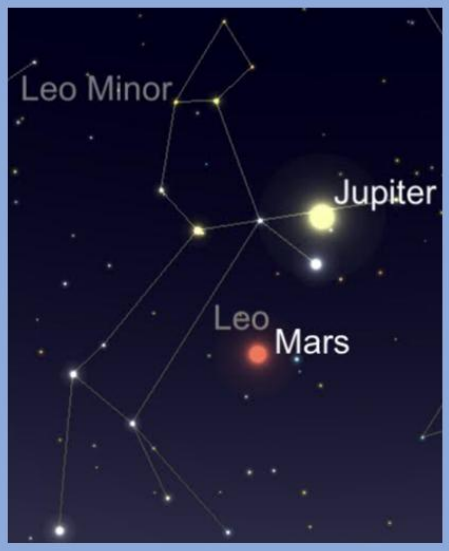
This will be a good year for the Geminid Meteor Shower will peak on the night of Dec 13–14. The shower actually extends for several days so the hardy observers coming to our Dec. 12 Members Night should enjoy several bright meteors. The Geminid shower is one to the best of the year for those willing to bundle up on a cold winter night.
The 3.5 day old moon sets in the SW at 20:25 and the radiant of the shower in Gemini rises in the NE at 19:00 and transits at 02:46. Unlike most other meteor showers, the Geminids are not associated with a comet but with an asteroid: 3200 Phaethon. The asteroid takes about 1.4 years to orbit the Sun. Learn more about the shower and a table of positions for Tulsa.
https://www.timeanddate.com/astronomy/meteor-shower/geminids.html

December Evening planets – SATURN is still the jewel of the evening sky. As December begins it is already 40 degs up in the SE at dusk and transits in the south at 8:00 PM. The moon skims by on the 17th and by Christmas. NEPTUNE stays close by about 6 1/2 degs west of Saturn. Both are in the western edge of Pisces. URANUS reached opposition Nov. 30 at magnitude +5.6 It is a fairly easy binocular sight and even naked eye in dark sky. It is located between the Pleiades and Hyades clusters in Taurus. Jupiter and Mars make their debut in the late evening sky.

Astro Photographer Wioleta Gorecka of Reykjavik, Iceland of took a wonderfully composed image of their November 16 conjunction ! JUPITER rises in the ENE at 11:00 PM in early December and 9:15 PM by Christmas. MARS is finely getting large enough at 8 arcsec to show a bit of detail at higher magnifications. As December begins It rises about 11:30 at mag +0.5 by months end it rises at 10:00 PM with a disc of 10.1 arcsecs at mag -0.1 Both Jupiter and Mars reach opposition in February - Jupiter on Feb 10th and Mars on Feb 19th So, we can look forward to many more opportunities to observe them. Try in-the-sky.org for finder charts of the planets.







OBSERVING JUPITER SHADOW TRANSITS & MUTUAL MOON EVENTS !

Every 6 years the Sun and Earth pass through Jupiter's equatorial plane. This Jupiter Equinox occurs December 16th. Since the four Galilean satellites orbit within a fraction of a degree (0.04° to 0.25°) of the planet's equator, we see their orbits nearly edge-on. In the next few months we will have many opportunities to see Jupiter's moons and their dark shadows passing across the disk of Jupiter. Even the possibility of seeing two shadow transits at the same time. Even a small aperture telescope at 80 to 100x will reveal the dark dot of a moon shadow crossing its disk. What you are seeing is a Solar Eclipse taking place on another planet. Search your phone's app store for an app that shows Jupiter's moons events.
Here is a web base tool. ExoSky Planetarium



It is also possible to witness one moon passing in front of another moon – Eclipsing a moon with its shadow or occulting it as it passes in front. You likely will not be able to image these events, but you can certainly watch as the two moons draw close together over several minutes – merge – and then draw apart. Maybe even detect a subtle change in magnitude.



This partial occultation of Europa passing in front of Ganymede can be observed from Tulsa on Dec 6th – from 10:57 pm to 11:50 PM
Start observing at least 10 to 15 mins before the event.

Sky & Telescope has a great article with a table of events. Times are in UT – so subtract SIX hours also determine if Jupiter has risen high enough to observe the event.

Mercury gets new visitors from Earth

On Saturday Nov. 21st the European-Japanese BepiColombo mission fired its thrusters to enter orbit around Mercury and begin to uncover its secrets. If all goes according to plan, BepiColombo will become only the second spacecraft to orbit the solar system's innermost planet, after NASA's Messenger mission orbited it between 2011 and 2015. Launched Oct 20, 2018, BepiColombo has taken Eight Years and multiple flybys of Earth, Venus and Mercury to finally be in position to match the speed and orbit of Mercury so that it could begin to orbit the planet.

The spacecraft is actually two satellites in one, the ESA's Mercury Planetary Orbiter (MPO) and Japan's JAXA's Mercury Magnetospheric Orbiter (Mio). If all goes to plan the spacecraft pair will enter their respective scientific orbits and begin their science operations by April.

See [BepiColombo Arrives at Mercury After 8-Year Odyssey]



Yule Tide Super Moon !

The Full Moon on the evening of Dec 23 -24 features the largest Super Moon since Nov. 2016 ! Its angular size wiil be 33'50" at a distance on 221,668 miles. The moon is full at 20:28 and reaches perigee (closest to Earth) at 02:30. Lunar Brilliance will get an addeded boost since Earth closest to the Sun on January 3rd !

Since the Sun is just 2 days passed its winter solstice point in Sagiattarius on Dec. 21 it is sets very low in the sky in the SW at 17:15 - The moon is at the opposite point on the Ecliptic near the summer solstice position in Gemini rising in the NE before sunset at 16:48. It should be an especailly bright moon lite evening with the Moon passing 80 degrees high over head just after Midnight on the 24th. If we have a bit of snow, we should have a super bright Christmas !!

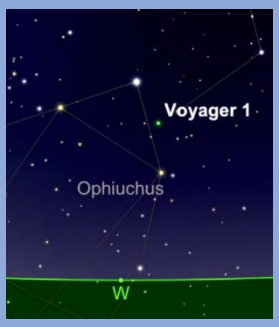
(A few Links for the Inquiring Minds) [Tables of Super moons 2000 to 2100]

[Explanation of Supermoons and Observing tips] (Note – times are from the BBC – CST + 6 hrs)



VOYAGER 1 travels ONE LIGHT DAY distance

The Voyager 1 spacecraft to the outer planets was launched Sept. 5, 1977, outward bound to flyby Jupiter and Saturn. As of the evening of November 17, 2026, it has now traveled ONE LIGHT DAY distance from Earth. Light travels at the incredible speed of 186,282 miles per second ! It takes only 500 seconds to travel from the Sun to the Earth (1 AU) The Distance that Light Travels in ONE LIGHT DAY is 16,094,799,105 miles! 16 Billion ! 173.2 AU's



As of Nov. 17, 2026, Voyager 1 has traveled 173.2 AUs in 17,970 days. Assisted by the gravity from its flybys of Jupiter and Saturn its average journey speed is 37,319 mph

To celebrate, people around the world are encouraged to FLASH its call sign V . . . _ G _ _ . R . _ . in morse code toward its location in the top of the constellation Ophiuchus which is in the west a bit after sunset.

See [https://science.nasa.gov/mission/voyager/voyager-1/] and [APOD image for Nov 20, 2026]

You may also enjoy the Webinar [50 years of Voyager Discoveries] with Dr Jeffery Hayes

While researching the numbers for this section I ran across a **Wonderful Website** with **Conversion Calculators** for all sorts of units. [https://www.kylesconverter.com/calculators]

Categories include – Fitness, Foodie, Geography, Geometry, Money, Math & Numbers, Photography and Videography ! Even Dog age to Equivalent Human Age 😊

Astronomy Club Outreach events

On November 11, Scott & Kit Bratt along with Don Sailing did a presentation to a group of about 30 kids at the Inola Library. Scott did a display of the planets and Don brought along his solar scope to view the sun and event Venus in the daytime.







Our Nov. 13 Public Telescope Viewing night in Hunter Park generated interest.







Observing Chairman Brad Young



The Effect of EAA on Winter Observations

"The long, dark, cold part of the year" – Take What the Night Gives You, author

As December nears, I think back to the many years when it seems like my amateur astronomy would slow down to a crawl in the winter due to the weather. Here in the South, it doesn't get bitterly cold and we often have clear nights, but it would be cold enough to keep me from going out to a dark sky site and doing visual astronomy. So, for most of my life, winter has been a time of astronomy doldrums when I turned my attention to other hobbies, the holidays, etc.

Now, after a year of using a Seestar, I know that this winter will be different because last winter was and so has everything during the year. Often, even in the summer I wouldn't want to go observing because it was too hot, or some other issue such as the very short nights we get then. I didn't matter much - I just set up my Seestar in my yard and did my imaging from downtown. Of course, I would get arguably better imaging at a dark sky site and get it with fewer exposures, using less time to provide the same or better image, but the convenience made up for it. If I wasn't happy with the image I got one night I would just stack that image set on to one another night and keep trying until things look the way I expected them to. And as winter approaches, I don't have to worry about dreading getting up on a ladder to look through my big Dob at deep sky objects. I can do imaging here at home and stay inside, nice and warm, while the telescope does all the work. It's not the same obviously, but for me it's a great expansion of the time during the year that I can use to observe. And of course, if I'm out at the dark sky site I can be doing both visual and imaging observations at the same time.



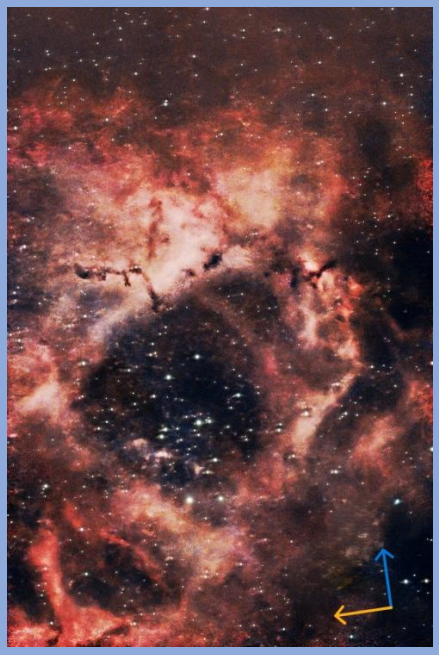
This is truly an exciting time for amateur astronomy. Not only is the technology bringing more people to the hobby, but it's giving people more time and convenience to do the hobby. We see this with the interest in the EAA devices at our public outreach. People love looking through the big Dobs and the normal telescopes, no doubt. But they also find the idea that they can enter the astrophotography market relatively cheaply and do things from home that are, in my opinion, amazing is going to be a true boon to the hobby. It certainly has been for me. At the Okie-Tex Star Party this year, I was doing observations and imaging at the same time as described above, and then when a cold front came through and I needed to

put my big Dob up due to storms, I didn't have to worry about bringing it out for the last two nights because I could sit inside my cabin while the temperature dropped below freezing and image from outside. In the old days that situation would have caused me to go home three or four days early and I would have missed the rest of the star party and all the fun I had.

The other indicator is in the number of these units sold. None of the manufacturers publish sales figures, but the size of Facebook user groups exceeds 20,000. Assuming 5x people are not in these groups, there are 100,000 or more units of all brands out there. During a lifetime of only a few years, this is an amazing amount of new tech, and my estimate may be way too small.

"The glass is half empty, but it's refillable." Super Noob Craft (video game)

It's easy to get down during winter if the weather is rotten, and you seem to never get to see the night sky. As I talked about in an earlier article, knowing what targets may be available if it suddenly clears is a useful way to approach winter. This can be accomplished with plans on some of the EAA units, where you can have a set of targets pre-loaded and, if the hour is still right, simply execute the plan and catch what you can. With visual astronomy, the same idea holds true except you are the planner; if you know what's available each night, you can jump on it when the time comes.



Rosette Nebula by author. Seestar 50 @35 min. Arrows N and E

Either way, whether you use EAA or not, don't let winter pass you by. When you can, go out and look at the brightest stars we have in our sky, as some of the most magnificent galactic nebula and clusters. Then, as spring approaches, the galaxy fields will start to show again and they are well worth a look too. Many of them are too small and faint for EAA, so I may have to drag out the Dob anyway, but something tells me by then I'll be ready for it and the nights will be warmer.

Enjoy the holiday season and clear skies to all and to all a steady night.

Treasurer Report
Cathy Grounds



As of Nov 18, 2026, we have 181 members with 74 new members this year.
Please welcome our newest members, Tim Vander Kooi, Jack Neeley,
Jeremy Winterscheid, and Tracie Baker

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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Join us for one of our Monthly Friday evening in town club meetings. Our meetings are free and open to both guests as well as our members.

Specific Dates are posted on our website

We will be meeting at the Tulsa Air & Space Museum Planetarium
Located at 3624 N 74th East Ave, Tulsa, OK 74115
On the road a bit east of the entrance to the Tulsa Zoo

The Tulsa Air & Space Museum hosts many indoor and outdoor exhibits and events commemorating Tulsa's rich history in Air and Space.

Check out the schedule for other full dome shows presented in the James E. Bertelsmeyer Planetarium. Use this link for Show Times and Tickets

ASTRONOMY CLUB OFFICERS:

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astrotulsa.pres@gmail.com

TREASURER – CATHY GROUNDS
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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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