



# OBSERVER

APRIL 2018

*Bringing Stars to the eyes of Tulsa since 1937*



**M13** globular cluster in Hercules contains 300,000 stars - diameter 160 light years and a distance of 22,180 light years. Rises 8:30 PM mid-April in NE – Photo by Frank Newby  
<http://www.messier.seds.org/m/m013.html>

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## Astronomy Club Events

Details at <http://astrotulsa.com/Events.aspx>

<b>APRIL</b>			
<b>EASTER SUNDAY</b>	<b>SUN APR 1</b>		
PUBLIC NIGHT	<b>SAT APR 7</b>	<b>7:30 PM</b>	ACT OBSERVATORY
MEMBERS' NIGHT	<b>FRI APR 13</b>	<b>8:00 PM</b>	ACT OBSERVATORY
<b>MESSIER MARATHON BACKUP</b>	<b>SAT APR 14</b>	<b>TBA</b>	TUVA Observing Grounds
<b>GENERAL MEETING</b>	<b>FRI APR 20</b>	<b>7:00 PM</b>	<b>JENKS PLANETARIUM</b>
<b>OBSERVATORY WORK DAY</b>	<b>SAT APR 21</b>	<b>9:30 AM</b>	ACT OBSERVATORY
SIDEWALK ASTRONOMY	<b>SAT APR 21</b>	<b>7:00 PM</b>	BASS PRO
<b>MAY</b>			
PUBLIC NIGHT	<b>SAT MAY 5</b>	<b>7:45 PM</b>	ACT OBSERVATORY
MEMBERS' NIGHT	<b>FRI MAY 11</b>	<b>8:15 PM</b>	ACT OBSERVATORY
MEMBERS' BACKUP NIGHT	<b>SAT MAY 12</b>	<b>8:15 PM</b>	ACT OBSERVATORY
<b>MOTHERS' DAY</b>	<b>SUN MAY 13</b>		
<b>GENERAL MEETING</b>	<b>FRI MAY 18</b>	<b>7:00 PM</b>	<b>JENKS PLANETARIUM</b>
SIDEWALK ASTRONOMY	<b>SAT MAY 19</b>	<b>7:30 PM</b>	BASS PRO
<b>MEMORIAL DAY</b>	<b>MON MAY 28</b>		

### Planets in April



The predawn sky is the place to be in early April but you'll need to be outside by 6:00 AM. Look to the SE to see **Mars** and **Saturn** are close together the first week of April. The 3<sup>rd</sup> quarter moon joins the pair April 7<sup>th</sup>.

**Jupiter** shines brightly in the SW sky before dawn. **Jupiter** will be rising in the SE evening sky at **10:50 PM April 1<sup>st</sup>** and **8:30 PM by May 1<sup>st</sup>**. Jupiter reaches opposition May 8<sup>th</sup>. **Venus** is shining brightly in the west after sunset. The Moon passes Jupiter on the morning of April 3, Mars and Saturn April 7 and a thin crescent moon joins Venus the evening of April 17.

**Meteor Showers:** <https://www.amsmeteors.org/meteor-showers/meteor-shower-calendar/>  
**Lyrid Meteor Shower** is visible from April 16 to 25 and peaks on the morning of April 22.

The radiant lies between Vega and Hercules and rises in the NE around 9:30 PM but is best seen after midnight when the moon sets. Rate is modest at 20 per hour. This meteor shower was first recorded by the Chinese in 687 BC.

**Eta Aquarid shower** This shower is produced by debris from Comet Halley. It is best observed the week of its peak on May 7<sup>th</sup> but can produce meteors from April 19 to May 26. Rates vary from 10 to 30 per hour. Look for fast meteors radiating out of the SE sky.

## Your Own Personal “Spy Satellite” from 250 miles up. *By John Land*

The International Space Station, ISS, has LIVE TV cameras attached that take continuous images of the Earth below. You can watch from above as images of the continents, oceans or clouds pass below. Flying at 17,200 mph the ISS takes about 92 mins to complete an orbit and circles the Earth 15.5 times per day. You can actually see its motion over the Earth below.

The May 2018 Sky & Telescope magazine has an article on the last page about ISS LIVE TV cameras and how to watch them at <https://www.nasa.gov/multimedia/nasatv/#iss> This page also has links to other NASA TV and Media presentations.

If you go to the website and see a BLACK SCREEN that just means the ISS is currently flying over the night side of Earth. Since it passes from night into daylight every 45 minutes you only have to check back periodically to find it flying over the daylight side. I chanced upon a Sunrise over the south Pacific and another time a sunset off the coast of California. It was pretty cool watching the changes in color take place in just a few minutes.



An ISS fly over is an impressive sight to watch. The station is 356 ft long by 240 ft wide and covered with reflective materials. It makes an impressive sight appearing like a bright silently moving “star” passing through the sky. The fly overs only last a few minutes so you need an accurate prediction for you location to look for it. The website <http://www.heavens-above.com/> gives predictions for the ISS as well as many other satellites. Be sure to setup your location when you open the site. You can do so from a zip code, city or entering a custom location. Once you’ve done so be sure to save it for future use.

There are several phones apps that help you find out where the ISS is at any time and gives predictions of when and where to look if a fly over will be visible from your location. The one I use is **ISS Spotter** that has simple maps of the earth below. A feature I like is its compass pointers to show where to look for ISS fly overs. **GoISSWatch ISS Tracking** has more realistic earth maps tracking ISS but its sky map is less friendly. It has much more data details on the ISS motions. view is– The GOISS app has an option to add other satellites for a fee upgrade.

**Both are free for the ISS tracking.** I now have both of them on my phone!

Passing over Pacific Ocean



Sunset off California coast



# PRESIDENT'S MESSAGE

BY TAMARA GREEN



March started off on a very sad note. One of our long-time members, Bobby Boston, passed away at his home on March 5 at the age of 74. Bobby joined the Club in 2003 and has organized events for us at Rogers State University and helped out at various big public events. Bobby and his wife Marcia were regulars at Messier Marathons and Okie-Tex as well as many other club events. He will be badly missed. His funeral took place at Butler-Stumpff & Dyer Chapel here in Tulsa. It was a packed house, with all kinds of family, friends, and colleagues. It was a very nice service, albeit very sad. The family appreciates those of us who were able to go being there to pay our last respects.

Mother Nature has not been kind to us this month as far as weather goes. Public Night, despite still being held on the 10th, was kind of a bust due to incoming clouds. Our Messier Marathon was supposed to be on the 17th, but got postponed to April 14. I will be sending more information about that to you all very shortly. Hopefully, we will have better weather. We won't be able to get all 110 objects this late in the year, but a partial marathon is better than none. Some of us did get together at my favorite Mexican restaurant for dinner as a "contingency plan", to enjoy wonderful food and fellowship, so the evening was not a complete bust!

I was unable to attend Sidewalk Astronomy on the 24th, due to my having had a witch of a cold and some of Owen's family from Denver being in town that same weekend. These are relatives he only gets to see once a year, maybe twice if he's lucky!

Several other club members set up telescopes for Sidewalk Astronomy on the 24<sup>th</sup> and there was a good turn out of guests.

As I said earlier, I will be sending out the information on the Messier Marathon next month to you all very shortly. I have updated the Marathon Packet with the sunrise, sunset, moonrise, moonset and search sequence times for April 14 and will send that out within the week. I will be leading the caravan as well. Stay tuned for more information!

Let's all hope for better skies and nicer weather in April!

*Clear Skies,*

*Tamara*



## *Astronomy Night at Tulsa Central Library –*

On Tues. March 6 members of the Tulsa and Bartlesville astronomy club's partnered for an astronomy activity night. An estimated 97 kids and parents were present. The Bartlesville group brought crafts to let the kids to make comet necklaces and planet hats. Library staff had a face painting area and members of our Tulsa club set up telescopes outside. We were especially pleased to have one of our newer members, Marinn White, helping the kids with their projects.

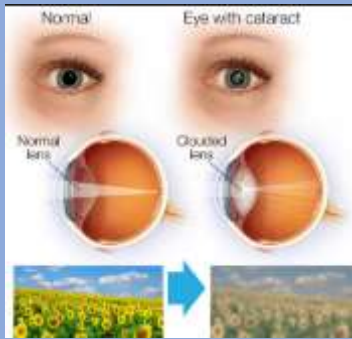
Top row – Jerry Cassity pointing to Orion – Marinn helping kids – Library Staff face painting

Middle row – Guests enjoying the evening crafts

Bottom row – John, Jerry & Skip – Looking a Betelgeuse in Skip's scope – Viewing M 42



## Vision Changes as we Age



As astronomers we develop keen observing skills to let us seek out the details of the fascinating but often dim treasures hidden in the canopy of space. We often talk about the light grasp and resolution of our telescopes. And discuss which eyepiece design offers the best views. Our eyes are the perception and information receiving window for all this celestial data input. As we age we become keenly aware that our eyes are undergoing changes too. Many of us start to need reading glasses in our 40's. Later we may need bifocal or trifocal glasses. As we approach our late 60's often the eye lens themselves begin to yellow or become hazy – a condition known as cataracts. The

techniques of cataract corrective surgery have vastly improved in recent years. Patients are able to go home within a few hours of the procedure and recovery time is just a few days. The criteria for when cataracts should be treated has also improved so that a person does not have to be severely impaired before qualifying. Medicare will also cover most of the cost. Member Bob Schwarz shares his story below.

## Multifocal Intraocular Lens Replacement

By Bob Schwarz



At the age of 68: Still doing rather well after lasik procedure I had in 2000, but still unable to use a rifle sight with right eye due to nearsightedness. Left eye was corrected to farsightedness as a result of lasik procedure. At the age of 69 cataracts showed up enough to make me eligible for cataract surgery able to be handled by Medicare. Medicare would only pay for *single focus* type lens implants. That option would still require eyeglasses to read (and other stuff). Not a practical option for my purposes.

Upon consultation with my eye doctor in October of 2016, (Ophthalmologist – Dr. Mark Allison ) associated with Warren Clinic, St Francis hospital, who specializes in cataract surgery <https://www.healthgrades.com/physician/dr-mark-allison-ykwtd> and more, the multifocal lens implant would not require glasses. Distant vision and near vision for reading and other close work would be equally served. He has undergone this surgical procedure, along with a relative of his. The price was \$4,900.00 for left and right eyes (\$2,450.00 per eye). As of this writing, the price may have changed and I believe it may have gotten less expensive but for me the price was worth whatever it took, within my budget. Even if it had not been within budget, St. Francis offered a monthly installments payment plan , interest free. What a deal !

**Post-Surgery Results:** My vision after the surgery at the one month check-up appointment had come in at 20/15 for each eye and at the one year check up 20/20. I noticed in the weeks and months after the surgery, blues were significantly bluer and the sky was just a wonder to behold. Colors were generally nicer, crisper, more pronounced than I had ever seen them and that's coming from a guy with moderate *protanomaly* - (slightly deficient color vision in tans and olive drabs- some greens? and some shades of red, I'm told).

What a pleasure to be able to read without glasses and immediately see things in the distance without having to hunt for GLASSES, like a person with normal visual acuity.

**Visual effects are:** Naked eye: a narrow donut type ring surrounding the moon and staring at street lights produces concentric rings as a result of the Fresnel lens-like characteristic of the lens implants.

**Star viewing:** about 6 to eight concentric rings around the brightest stars and viewing street lights and some very bright automobile tail lights. I don't make it a habit of staring at street lights and head/tail lights. You get used to it and don't notice it that much. To me, a small inconvenience compared to great visual acuity.

**March 3, 2018** looking through my Meade 900mm Maksutov-Cassegrain using 28 mm RKE (44.6x) and Meade MA9mm (138x) eyepieces:

A good clear dark sky until moonrise about 10pm. I sighted in on the nebula in Orion with the 28mm. This magnitude star field presented not much of a problem although slight 'flaring' of individual stars was generated with off center eye/head movements. Looking at Sirius with 44.6x magnification accentuated the eight concentric rings evident around the star especially moving the eye off-center where flaring occurred. Viewing the waxing gibbous moon, the concentric rings of the multifocal intraocular lens implants was evident, but I was able to adjust the focus of my eye by 'looking past' the distortions of the concentric rings and concentrating on the details of craters near the limb and close to the terminator.

The moral of this story is this: If you want perfect visual acuity and crisp clear undistorted vision, get born with it and stay lucky. Otherwise, Lasik is great for 8 or 10 years until you get cataracts near the age of 70 or so. I still wish I'd had this surgery available when I was 19 or 20 years old, during my flight training. Still, better late than never. I'll still take 20/20 at my age, hands down !!

## TELESCOPES FOR SALE – PRICES REDUCED – MAKE REASONABLE OFFER

### Meade Starfinder 10 inch F 4.5 Dobsonian - Reduced Price \$ 400

With Telerad finder and 6x by 30mm finder scope - 1.25 / 2.0 in rack and pinion focuser

Quality Upgraded Eyepieces with a handy carrying case and two red light accessories.

Meade 1.25 " Super Wide Angle 24.5 & 13.8 mm Orion 21mm to 7mm Zoom Eyepiece

Meade 2X Teleneegative amplifier—and more

Details in February newsletter - [http://astrotulsa.com/CMS\\_Files/02-2018.pdf](http://astrotulsa.com/CMS_Files/02-2018.pdf) page 13

Contact John at [Tulsaastrobiz@gmail.com](mailto:Tulsaastrobiz@gmail.com)







**2018 CONVENTION**  
**June 22<sup>ND</sup> - 24<sup>TH</sup>**

Hosted by



&



*Special Guest Speaker*

**DAVID H. LEVY**



*Friday Evening*

Star Party, Youth Cosmic  
Scavenger Hunt & Dinner  
@ Hobbs State Park



*Saturday & Sunday AM*

MSRAL Meeting, Speakers &  
Convention  
@ Explore Scientific



*Saturday Evening*

Banquet & Special Speaker  
@ Northwest Arkansas  
Community College

*nearby*

"Giant Telescope" Tour &  
Sidewalk Astronomy

Explore Scientific  
1010 S. 48th Street,  
Springdale, Arkansas 72762

2018 MSRAL Information  
479-231-4173  
P.O. Box 321  
Bentonville, AR 72712  
scas2018msral@gmail.com

[www.MSRAL.org](http://www.MSRAL.org)





## MSRAL 2018 CONVENTION



Registration information forms, maps and lodging information available at <http://www.msral.org/> for the Mid-States Region of the Astronomical League (MSRAL) convention. This special event is open to everyone interested in astronomy. **The convention will be held at the Explore Scientific facility located at 1010 S. 48th Street, Springdale, Arkansas 72762.** Registration and Check-in will begin at Explore Scientific Friday afternoon. Registration will continue at a **Star Party and Youth Cosmic Scavenger Hunt at the Hobbs State Park.** An optional evening meal will be available for purchase at this event.

Saturday morning will begin with a complementary, continental breakfast for registrants and continue with the MSRAL meeting and a full day of speakers. There will be a lunch break at the noon hour. Attendees can optionally purchase a box lunch served on site.

**David H Levy will be the special guest speaker for the Saturday evening Banquet.** David Levy is a well-known comet, asteroid hunter, Astronomy book author and writer for astronomy magazine publishers. Perhaps he is most famous for his co-discovery of Comet Shoemaker-Levy 9 that crashed into Jupiter in July 1994. [https://en.wikipedia.org/wiki/David\\_H.\\_Levy](https://en.wikipedia.org/wiki/David_H._Levy) <http://jarnac.jarnac.org/>



The banquet will be held on the campus of the Northwest Arkansas Community College in Bentonville, AR.

After the banquet, there will be a **tour of the “Giant Telescope” and Sidewalk Astronomy.** The “Giant Telescope” is a Relocation /Restoration Project of a 1911, 24-inch aperture 36 ft long refractor telescope.

There will be a complementary, continental breakfast for registrants Sunday morning followed by additional speakers and the grand giveaway before the closing remarks at noon.

For old school, mail-in registration please find the form on the last page. On-line registration will be available very soon. Please check the Mid State Region’s website at [www.MSRAL.org](http://www.MSRAL.org)

**This article is provided by NASA Space Place.**

With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology.

Visit [spaceplace.nasa.gov](https://spaceplace.nasa.gov) to explore space and Earth science!



## **What Is the Ionosphere?**

By Linda Hermans-Killiam

High above Earth is a very active part of our upper atmosphere called the ionosphere. The ionosphere gets its name from ions—tiny charged particles that blow around in this layer of the atmosphere.

How did all those ions get there? They were made by energy from the Sun!

Everything in the universe that takes up space is made up of matter, and matter is made of tiny particles called atoms. At the ionosphere, atoms from the Earth’s atmosphere meet up with energy from the Sun. This energy, called radiation, strips away parts of the atom. What’s left is a positively or negatively charged atom, called an ion.

The ionosphere is filled with ions. These particles move about in a giant wind. However, conditions in the ionosphere change all the time. Earth’s seasons and weather can cause changes in the ionosphere, as well as radiation and particles from the Sun—called space weather.

These changes in the ionosphere can cause problems for humans. For example, they can interfere with radio signals between Earth and satellites. This could make it difficult to use many of the tools we take for granted here on Earth, such as GPS. Radio signals also allow us to communicate with astronauts on board the International Space Station, which orbits Earth within the ionosphere. Learning more about this region of our atmosphere may help us improve forecasts about when these radio signals could be distorted and help keep humans safe.

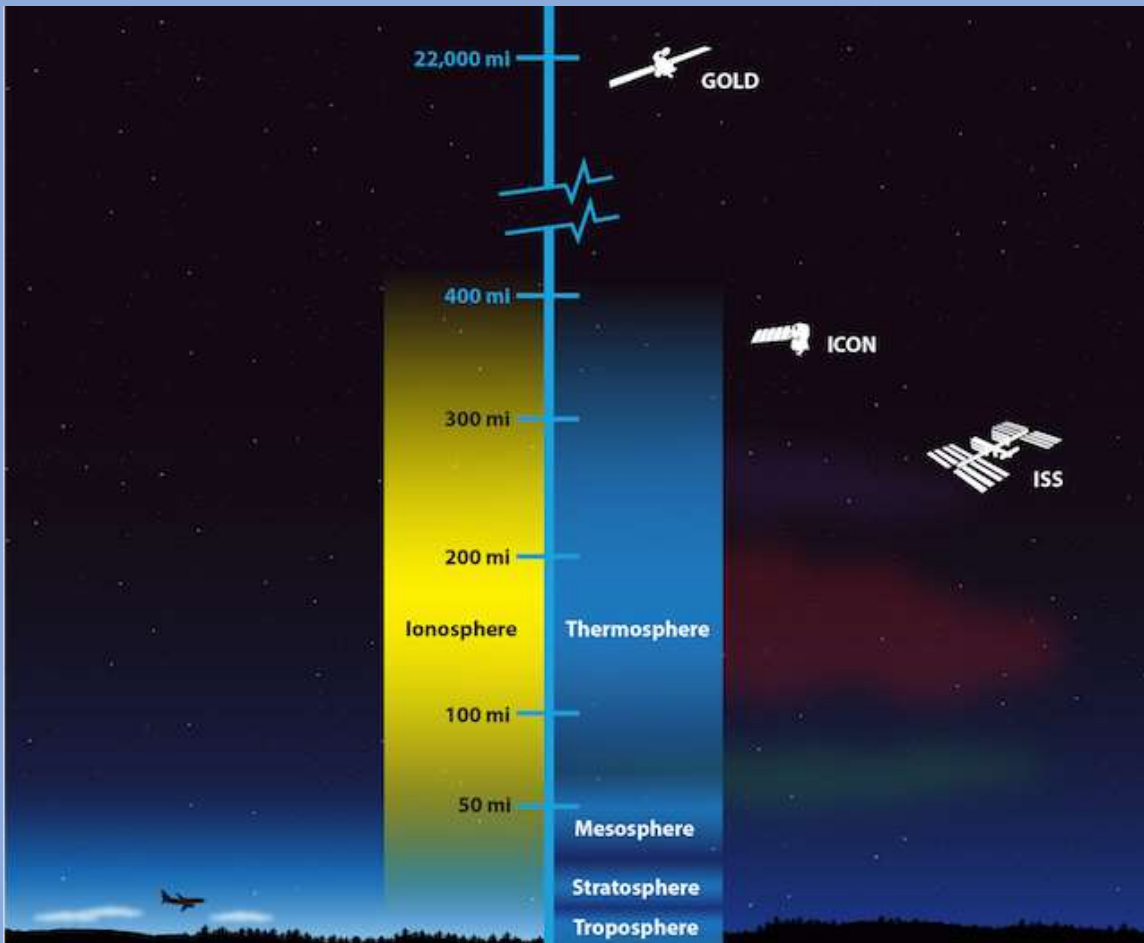
In 2018, NASA has plans to launch two missions that will work together to study the ionosphere. NASA's GOLD (Global-scale Observations of the Limb and Disk) mission launched in January 2018. GOLD will orbit 22,000 miles above Earth. From way up there, it will be able to create a map of the ionosphere over the Americas every half hour. It will measure the temperature and makeup of gases in the ionosphere. GOLD will also study bubbles of charged gas that are known to cause communication problems.

A second NASA mission, called ICON, short for Ionospheric Connection Explorer, will launch later in 2018. It will be placed in an orbit just 350 miles above Earth—through the ionosphere. This means it will have a close-up view of the upper atmosphere to pair with GOLD’s wider view. ICON will study the forces that shape this part of the upper atmosphere.

Both missions will study how the ionosphere is affected by Earth and space weather. Together, they will give us better observations of this part of our atmosphere than we have ever had before.

To learn more about the ionosphere, check out NASA Space Place:

<https://spaceplace.nasa.gov/ionosphere>



*This illustration shows the layers of Earth's atmosphere. NASA's GOLD and ICON missions will work together to study the ionosphere, a region of charged particles in Earth's upper atmosphere. Changes in the ionosphere can interfere with the radio waves used to communicate with satellites and astronauts in the International Space Station (ISS). Credit: NASA's Goddard Space Flight Center/Duberstein (modified)*



**JENKS PLANETARIUM**  
 Jenks High School Campus  
 205 East B Street, Jenks

**TICKETS**

\$5 online or \$7 at the door  
 Purchase online at [jenkscommunityed.com](http://jenkscommunityed.com)  
 or call 918-298-0340

**2018 [Go to Show Schedule](#)**

**Then click the Date Column to sort them by show date**



**JENKS PLANETARIUM**

Explore the night sky with engaging, awe-inspiring shows at the Jenks Planetarium. The 50-foot dome provides the ultimate screen for seeing planets up close, flying to distant galaxies, and even rediscovering our own earth in ways never thought possible.



# TREASURER'S AND MEMBERSHIP REPORT

BY TIM DAVIS



**Astronomy Club of Tulsa: 166 members, including 12 new members in 2018.**

**Welcome to our new members this month:**

**Gary Nettle, Randal Pulliam, Don Casady, Justin Faulk and Jon Morrison.**

**Club Accounts as of March 28, 2018:**

**Checking: \$ 5,287.46**

**Savings: \$ 6,778.01**

**Investment accounts: \$ 22,133.62** (*Value Fluctuates with Market*)

**The club now has PayPal available for you** to start or renew memberships and subscriptions using your credit or debit cards. Fill out the registration form at <http://astrotulsa.com/page.aspx?pageid=16> **Click Submit** and you will be given the choice of either **mailing in your dues** with a check **or using PayPal** which accepts most major credit cards. A modest processing fee is added to PayPal transactions.

You may also renew your membership or join at one of our club events using your credit card by seeing one of our officers. We can take payments with the Square card reader. A small fee is also added on to these transactions.

**ALSO NOTE:** For our current members who are renewing their memberships, you can now go to a new link on the website to start your renewal process. On the home page, hover over the "Member" tab on the ribbon menu near the top of the page. Then select the "Membership Renewal" link and this will take to a page to fill out your information. Fill this out, submit it, then pay your dues by whatever method you choose.

**NEWS NOTE:** Both Sky & Telescope and Astronomy have free Digital subscriptions available with print subscriptions, or Digital subscriptions may be purchased separately. Contact their websites for details.

Membership rates for **2018** are as follows:

**Adults: \$ 45 per year, includes Astronomical League Membership.**

**Sr. Adult: \$ 35 per year** for those 65 or older, includes Astro League Membership.

**Students: \$ 30 with League membership; Students: \$ 25 without League membership.**

**Additional Family membership: \$ 20 with voting rights and League membership.**

**\$ 15 with voting rights but without League Membership.**

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

**Join Online – Add or renew magazine subscriptions.**

<http://www.astrotulsa.com/page.aspx?pageid=16>

**Magazine Subscriptions:** If your magazines are coming up for renewal, try to save the mailing label or renewal form you get in the mail. Forms are available on the club website.

**Astronomy is \$ 34 for 1 year, or \$ 60 for 2 years.** [www.astronomy.com](http://www.astronomy.com)

To get the club discount you must go through the club group rate.

**Sky & Telescope is \$ 33 per year** [www.skyandtelescope.com](http://www.skyandtelescope.com)

Sky & Telescope also offers a 10% discount on their products.

**Note:** You may renew your Sky & Telescope subscription directly by calling the number on the renewal form, **be sure to ask for the club rate.**

NEW SUBSCRIPTIONS must still be sent to the club

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

Check our Events Page of Dates [Link to Events Page](#)



During the school year our club holds a **Monthly General Club meetings** at **Jenks Public Schools Planetarium**  
**205 East B St, Jenks, OK**  
**Located North of the intersection of 1st and B St**

**Meetings begin at 7:00 PM**

**When you enter the building lobby, take the elevator to the 3<sup>rd</sup> floor.**

[Click for Google Map Link](#)



### Sidewalk Astronomy Night

East side of Bass Pro in Broken Arrow near the lake.  
101 Bass Pro Drive, Broken Arrow, OK

[Click Map Link here](#)

On a Saturday evening near the 1<sup>st</sup> Quarter moon Astronomy Club volunteers set up telescopes to share views of the moon, planets and other bright objects. It's a come and go event where shoppers and restaurant goers get a chance to experience glimpses of the universe with their own eyes.



### 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.

### PUBLIC OBSERVING NIGHT on a Saturday

This event is open to individuals and families.  
Club members set up telescope 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. [Link to Events Page](#)

[Click for Observatory Map](#)

CAUTION: **DO NOT use GPS** it will likely send you on some nearly impassible back roads.

## ASTRONOMY CLUB OFFICERS:

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NIGHT SKY NETWORK –  
Open Position

WEBMASTER JENNIFER JONES

**Did you hear about the  
great new restaurant on  
the moon?**

**The food is excellent, but  
there's no atmosphere.**

**Where would an astronaut  
park his space ship?**

**At a Parking Meteor.**

**Can't stand lame jokes?**

**Send in some astronomy  
images!**

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