



OBSERVER

MAY 2019

Bringing Stars to the eyes of Tulsa since 1937

Editor – John Land



This wonderful Mosaic of moon, planets and stars was put together by member William Collier

Most commonly observed planets and moon superimposed on the Orion constellation. Saturn, Jupiter, Mars and then Venus near quarter phase. Then the crescent moon and a very red full lunar eclipse. This is a composite image created using GIMP by overlaying planetary and lunar images. Saturn, Jupiter, Mars and Venus with eyepiece projection and video stacking through the Orion XT8. Lunar eclipse with the Orion ST80 3" refractor. Background was a 50—135 mm kit zoom lens on the Canon 450D DSLR.

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Astronomy Club Events

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

MAY				
MEMBERS' NIGHT	New	FRI, MAY 3	8:00 PM	OBSERVATORY
MEMBERS' BACKUP NIGHT	New	SAT, MAY 4	8:00 PM	OBSERVATORY
GENERAL MEETING	1ST Q	FRI, MAY 10	7:00 PM	JENKS PLANETARIUM
SIDEWALK ASTRONOMY	New	SAT, MAY 11	7:00 PM	BASS PRO
MOTHERS' DAY		SUN, MAY 12		
PUBLIC NIGHT	3rd Q	SAT, MAY 25	8:00 PM	OBSERVATORY
MEMORIAL DAY		MON, MAY 27		
MEMBERS' NIGHT	New	FRI, MAY 31	8:30 PM	OBSERVATORY
JUNE				
MEMBERS' BACKUP NIGHT	New	SAT, JUN 1	8:30 PM	OBSERVATORY
SIDEWALK ASTRONOMY	New	SAT, JUN 8	7:30 PM	BASS PRO
SUMMER SOLSTICE		FRI, JUN 21		
PUBLIC NIGHT	3rd Q	SAT, JUN 22	8:15 PM	OBSERVATORY
MEMBERS' NIGHT	New	FRI, JUN 28	8:45 PM	OBSERVATORY
MEMBERS' BACKUP NIGHT	New	SAT, JUN 29	8:45 PM	OBSERVATORY



ALCon 2019
 50th Anniversary of the First Moon Landing
 July 25 - 29, 2019
 Kennedy Space Center and Southern Skies Cruise to the Bahamas

The Astronomical League will celebrate the 50th anniversary of the Apollo Moon landing at its annual ALCon convention July 25 to 29, 2019

Featuring tours of the Kennedy Space Center and a Southern Skies Cruise to the Bahamas. Weather permitting sections of the deck lights will be turned off to enjoy dark Atlantic skies. Special reserved rates for the cruise are going fast **so make your reservations ASAP**

Reservation Details at <https://alcon2019.astroleague.org/>

Note: A valid passport is required for the cruise – ask your local post office for passport requirements and allow plenty of time for processing.



2019 MidState Regional Astronomical Convention
Friday, June 14 - Sunday, June 16
Rockhurst University, Kansas City Missouri
Hosted by: Astronomical Society of Kansas City
Register Early for a door prize drawing
<http://msral.org/>

A tour of the rare book area of Linda Hall Library for Science, Engineering and Technology is planned for Friday. The collection includes rare astronomy and other technical books, as well as the observing logs of famed comet discoverer, Dr. David Levy. Tour and observe at the Powell Observatory featuring a 30 inch Reflector and additional smaller scopes. A Friday "Star B-Que" Guest speakers and presentations and Saturday evening banquet. Discounted lodging rates are available. Our Tulsa Club is hoping to host one of the MSRAL conventions soon, so plan to attend this one to see what all the fun is about.

Jenks Planetarium Celebrates Apollo 11 Moon Landing



July 20, 2019 is the 50th Anniversary of the Apollo 11 Landing on the moon. The Jenks Planetarium is planning a weeklong celebration of Mankind's First Steps on the Moon. With multiple showings of its show recreating the landing using actual NASA footage from the day of the landing.

JENKS PLANETARIUM
205 East B Street, Jenks

Regular Show Tickets
 \$5 online or \$7 at the door

Purchase online at
jenkscommunityed.com
 or call 918-298-0340

2019 [Go to Show Schedule](#)

**Click the Date Column
 to sort them by show date**

APOLLO 11 50TH ANNIVERSARY EVENT--JULY 20 *New!*

Don't miss this special event designed for the entire family! View two new exciting shows in the dome including Apollo 11: Man's First Step on the Moon, created for this event by Jenks staff and students. Solar Superstorms will also be featured, a new production that takes viewers into the tangle of magnetic fields and superhot plasma that result in dramatic flares and violent solar tornadoes.

Plus, enjoy special activities in the Math and Science Building including making and launching parachutes, conducting mission control tests, enjoying story time, viewing space exhibits, looking through solar telescopes on the roof, and more. Food trucks will provide fun options for snacks and lunch. **Cost per person is \$10 by June 14; \$12 after June 14 (does not include food and drink). Space is limited! Choose from two July 20 sessions (includes shows and activities): 10:00am-12:00noon or 12:00noon-2:00pm. To enroll, visit jenkscommunityed.com.**

Tuesday, June 4	Solar System Protection Agency: Weldon's Story (Ages 4 & Up)...	12pm
Tuesday, June 4	The Sky We Don't See (Ages 6 & Up).....	7pm
Thursday, June 6	Earth, Moon & Sun (Ages 4 & Up)	12pm
Thursday, June 6	Compass, Calendar, Clock (Ages 10 & Up)	7pm
Saturday, June 8.....	Animals of the Sky (Ages 4 & Up)	12pm
Saturday, June 8.....	Spring Sky (Ages 6 & Up).....	8:30pm
Monday, June 10	My House Has Stars (Ages 4 & Up).....	12pm
Monday, June 10	Astrology: The Historic Beginning of Astronomy (Ages 4 & Up).....	7pm
Wednesday, June 12....	Solar System Protection Agency: Weldon's Story (Ages 4 & Up)...	12pm
Wednesday, June 12....	Sistine Chapel (Ages 8 & Up).....	7pm
Tuesday, July 16.....	Apollo 11: Man's First Step onto the Moon (Ages 6 & Up).....	12pm
Tuesday, July 16.....	Apollo 11: Man's First Step onto the Moon (Ages 6 & Up).....	7pm
Thursday, July 18	Apollo 11: Man's First Step onto the Moon (Ages 6 & Up).....	12pm
Thursday, July 18	Apollo 11: Man's First Step onto the Moon (Ages 6 & Up).....	7pm
Monday, July 22.....	Solar System Protection Agency: Weldon's Story (Ages 4 & Up)...	12pm
Monday, July 22.....	Apollo 11: Man's First Step onto the Moon (Ages 6 & Up).....	7pm
Wednesday, July 24	My House Has Stars (Ages 4 & Up).....	12pm
Wednesday, July 24	Sistine Chapel (Ages 8 & Up).....	7pm

PRESIDENT'S MESSAGE

BY TAMARA GREEN



Summer is almost here, and that means we have some really exciting things coming up! We will have our last General Meeting before the Summer break on Friday, May 10. At the time of this writing, I do not have a guest speaker lined up, but I'm still working on that. We may even be previewing a new planetarium show.

Our Summer public nights have always drawn a good crowd, so everyone gear up for those! We have good attendance, and I have organized a new way of staffing volunteers for them, in order for them to run more smoothly.

We have a special star party in June at TASM. The Oklahoma Science Teachers Association is holding their annual meeting June 7 & 8 in Tulsa. They are holding their Celebration of Science Banquet at TASM on Friday June 7. A teacher at Norman North High School requested we hold a star party for the teachers following their banquet. We will be asking for volunteers to help to these teachers learn more about astronomy so they can take it back to the classrooms.

We are planning to have quarterly star parties with TASM! Those will be fun as well, and we will need volunteers from our club to come help!

We hope to do another members' picnic at the observatory. If we do this, the date and time will be announced soon.

And don't forget to register for Okie-Tex 2019! The dates are September 21-19, 2019. Hopefully we will have much better weather this year! Registration for the event is due by August 31, 2019 and registration for meals is due by September 1, 2019. I hope to see you there! Owen and I plan on going, if he can get the PTO approved! I will be going anyway, either way.

Speaking of exciting things coming up, our club, in a collaborative effort with Broken Arrow Sidewalk Astronomers, is going to put in a bid to host MSRAL 2020! Right now, we are trying to hammer out some details that have become difficult, but I believe we can work through those and get something worked out! So far, we have a skeleton, we just need to flesh it out. If we do this, we will need volunteers to help with this too! It is only for a weekend, so it's totally doable! More details will be coming soon as we get this worked out.

Clear Skies, Tamara Green



We would like to extend our best wishes to Tony and Jess Cagnolatti as they prepare to move to Austin for new job opportunities. Tony and Jess came to our club in 2017 very excited to find a hobby they were both could share together. They soon became regular volunteers at our SideWalk Astronomy events at Bass Pro and helping at Public Nights at the observatory. They were both elected to our ACT board last fall and Jess volunteered to accept the role of club Secretary. Tony has



helped with several improvement projects at the observatory also. Tony and Jess, we'll miss you and wish your many more Starry Nights to share together and find new astronomy friends in Texas. As the line from a song says "*The Stars at Night are Big and Bright in Texas*" "*Deep in the Heart of Texas*"



Treasurer John Newton's comments -

I counted about 37 who attended our April 12th General Meeting at the Planetarium. We were graced with the presence of a young and talented teenage guest speaker, Abigail Bollenbach. Abby is a member of the Bartlesville Astronomy club's youth division, "The Bartian Martians". In 2018 she was awarded the Astronomical League's Jack Horkheimer/Smith Youth Service award for outstanding participation in her club and astronomy outreach.

Abby amazed us with many interesting facts and details surrounding the Cassini Mission to Saturn that night while presenting a compelling PowerPoint slide show. In addition, she brought models of the satellite, reference books, picture posters and other artifacts to enhance the project discussion and answered our many questions.

She is already working on two new project adventures in promoting astronomy. We wish her continued success and hope to hear from her again soon. Her versatility in astronomy and studies in other sciences will only gain her additional recognition in Abby's future. Thank you for your time with us at ACT, Abby!



Why is Glass Clear?

By John Land



Physics is full of mysteries. One mystery that has often bugged me is:

How Do Photons of light get through the glass? Do the same photons that enter the glass come out on the other side? Glass is a fairly dense material. Depending of the type of glass its density ranges from 2 to 8 Kg per liter. (Water 1 Kg/liter - Steel is 8 Kg/liter) Most materials absorb or reflect the photons that strike it so that they never pass through. **So how do they get through Glass?**

The answer to the question came in an unusual way. My wife and I like to check out an Audio Book from the library when we travel. On a recent day trip we chose the book "How We got to Now" by Steven Johnson. In this fascinating book he weaves together seemingly unrelated events and people that drove forward revolutionary changes in how we live and view the world around us. In the chapter on **Glass**, he connects how - an air burst of an exploding comet 26 Million years ago - the fall on Constantinople in 1453 - fires in Venice - seaweed - and a cross bow brought about our modern telescopes, fiber optics and even "Selfies"

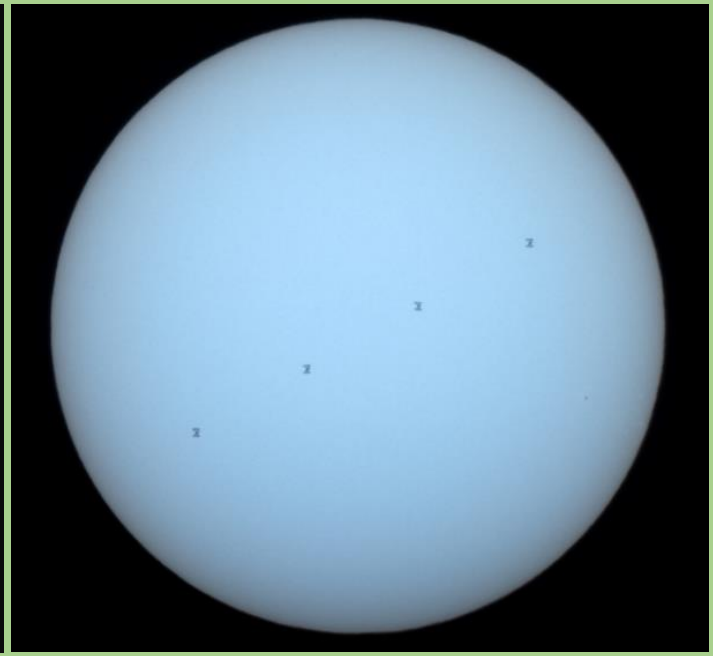
In the midst of all that Johnson explained an unique property of Silica-Dioxide (Glass) When light strikes most materials the electrons of the atoms within the material absorb some of the energy which bumps (excites) the electrons up to a higher energy level within the atom. The electrons within each atom require a precise quantum of energy to allow them to move from one energy level to another. The energy of the incoming photon must exactly match one of these quantum steps for it to be absorbed and excite the electron to a higher level. The quantum energy levels of Silica-Dioxide are so high that photons of visible light don't have enough energy to excite its electrons therefore they simply pass through unabsorbed. So that is why light can pass through glass! However, photons of Ultraviolet light do have enough energy to be absorbed. So, you can't get a sunburn from light streaming through a large picture window.

In the chapters in his book, Johnson explores topics such as Glass, Cold, Time, Clean, Light and Sound. In mid-April our PBS station OETA began airing programs based on his book at 10:00 PM on Weds nights. The episode on Glass airs Weds May 1st at 10:00 PM

Learn more at <http://www.pbs.org/how-we-got-to-now/home/>



John Moore



April 19, 2019

Skip Whitehurst

Capturing ISS Transits of the Sun and Moon

By John Moore

Having fun with astronomy doesn't necessarily require a clear night. With the recent lack of good nighttime conditions Skip Whitehurst and John Moore decided to attempt to photograph an ISS solar transit where the International Space Station passes directly in front of the sun and can be recorded assuming you are in the exact location on the earth. Capturing this event is very similar to any other occultation event and Skip and John have experience with having recorded multiple asteroid and lunar occultations over the past few years.

After checking the website <https://transit-finder.com> it was decided to try to record a transit on Good Friday, April 19th. The ISS shadow path would be passing directly over Tulsa at 3:05:18 pm and the weather prediction was for a beautiful, clear day.



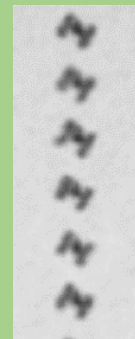
Skip set up his equipment near TU and John decided the Tulsa fairgrounds parking lot would be a good spot. Public access, acres of asphalt, and easy access made both locations ideal for this type of activity. Both observers used Baader white light filters covering the front of their respective OTAs to keep the harmful energy of the sun from destroying their equipment. Skip used his DSLR in burst mode to take a series of still images at 5 fbs. John used a ZWO astro camera to record video at 44 fps seen at left. Note: It doesn't take a large scope to capture these transits.

The transit-finder website provides all the information needed including the exact time that the ISS will pass in front of the solar disc. It only took 0.91 seconds for the ISS to transit from one edge of the sun to the other, so very precise timing is required to capture the silhouette of the ISS against the surface of the Sun.

The results of both attempts can be seen above. John's video can be seen at

<https://youtu.be/oNX-ZCE4SOM>

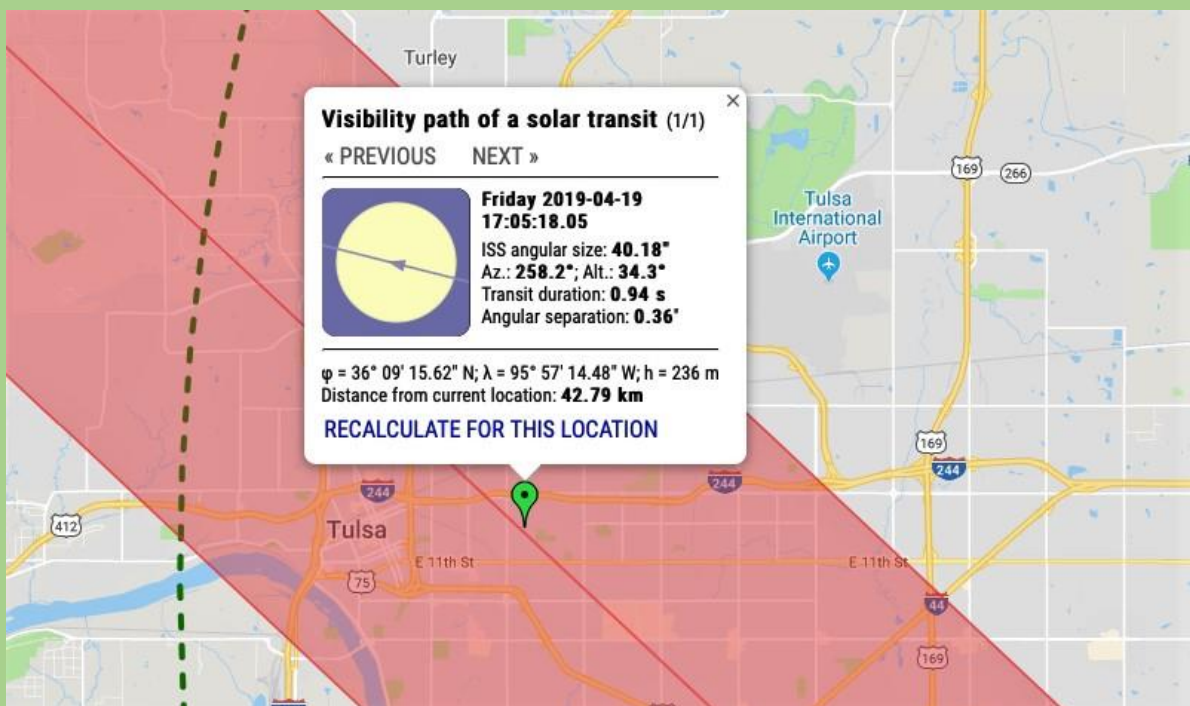
At right is a closeup of the ISS Transit. >



This is a challenging and fun exercise and allows astronomy enthusiasts to get out and play with their toys on clear days as well as at night. Both Skip and John are planning on doing more of these recordings, both daytime solar and nighttime lunar transits. Some impressive examples are available on YouTube – just search for “ISS Transit” to see what many people from all parts of the world have been able to record.

Editor's additions:

Below is the transit map generated from the website <https://transit-finder.com>. It's a surprisingly simple and extremely accurate website. If you click on the **Auto Detect** feature it will read your computer / phone's exact location if you have tracking turned on. Then you can select a range of dates to search for and a distance from your location. It will then generate Solar or Lunar Transits within that range. Also it will give near passes of the ISS to the Sun or Moon. The maps are highly detailed google style maps that can zoom in tight on your location. When the editor was preparing this article for the newsletter, he discovered that a Solar transit had taken place over his house on April 23rd and that the center line was barely a mile to the east. Sadly I didn't discover that until the evening of the 24th. ☹️





This article is distributed by NASA Night Sky Network

May 2019

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.org to find local clubs, events, and more!

Watching the Late Spring Skies

David Prosper

Late spring brings warmer nights, making it more comfortable to observe a good showing of the Eta Aquarids meteor shower. Skywatchers can also look for the delicate Coma Star Cluster, and spot the Moon on the anniversary of Apollo 10's "test run" prior to the Moon landing in 1969.

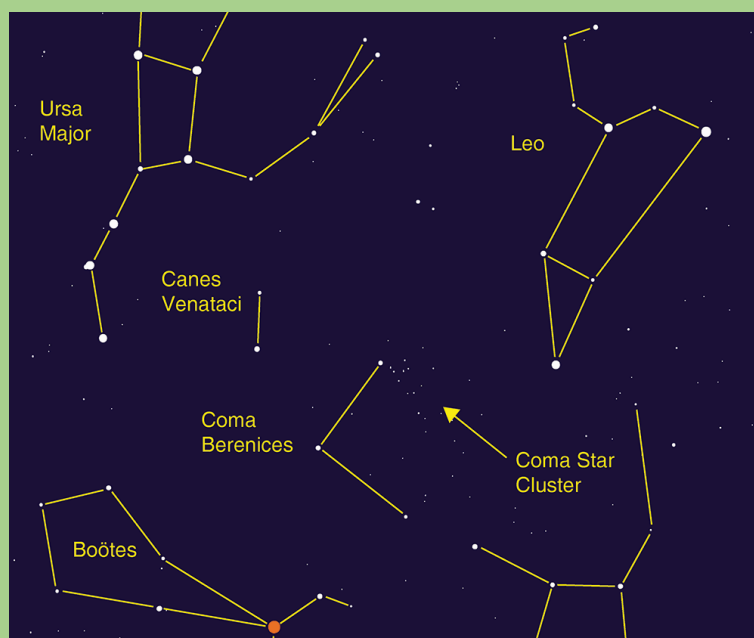
The Eta Aquarids meteor shower should make a good showing this year, peaking the morning of May 6. This meteor shower has an unusual "soft peak," meaning that many meteors can be spotted several days before and after the 6th; many may find it convenient to schedule meteor watching for the weekend, a night or two before the peak. You may be able to spot a couple dozen meteors an hour from areas with clear dark skies. Meteors can appear in any part of the sky and you don't need any special equipment to view them; just find an area away from lights, lie down on a comfy lawn chair or blanket, relax, and patiently look up. These brief bright streaks are caused by Earth moving through the stream of fine dust particles left by the passage of Comet Halley. While we have to wait another 43 years for the famous comet grace our skies once more, we are treated to this beautiful cosmic postcard every year.

While you're up meteor watching, try to find a delightful naked eye star cluster: the Coma Star Cluster (aka Melotte 111) in the small constellation of Coma Berenices. It can be spotted after sunset in the east and for almost the entire night during the month of May. Look for it inside the area of the sky roughly framed between the constellations of Leo, Boötes, and Ursa Major. The cluster's sparkly members are also known as "Berenice's Hair" in honor of Egyptian Queen Berenices II's sacrifice of her lovely tresses. Binoculars will bring out even more stars in this large young cluster.



May marks the 50th anniversary of the Lunar Module's test run by the Apollo 10 mission! On May 22, 1969, NASA astronauts Thomas Safford and Eugene Cernan piloted the Lunar Module - nicknamed "Snoopy" - on a test descent towards the lunar surface. Undocking from "Charlie Brown" - the Command Module, piloted by John Young - they descended to 47,400 feet above the surface of the Moon before returning safely to the orbiting Command Module. Their success paved the way for the first humans to land on the Moon later that year with Apollo 11. Look for the Moon on the morning of May 22, before or after dawn, and contemplate what it must have felt like to hover mere miles above the lunar surface. You'll also see the bright giant planets

Saturn and Jupiter on either side of the Moon before sunrise. When will humans travel to those distant worlds?



Try to spot the Coma Star Cluster! Image created with assistance from Stellarium

TREASURER'S and MEMBERSHIP Report

BY JOHN NEWTON



As of April 24th, the Astronomy Club of Tulsa has **160 members**. We welcome our new members starting month – **Chloe Frazier-Simonton** and **Debra Chapman**. Hello and welcome to ACT! We look forward in seeing you at our meetings and other club gatherings. Also, a special 'Thank You!' goes out to our long-term members for their continued support.

Accounts as of April 24, 2019 -

Checking: \$ 7,048.60

Savings: \$ 5,781.15

Investments: \$ 24,278.43 (Value tend to fluctuate with market changes).

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. Details - Contact their websites

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

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

Sky & Telescope is \$ 33 per year 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

Dates and Times for Events are found at www.AstroTulsa.com under EVENTS tab
Be sure to check the Website for Weather Cancellations before coming.

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 3rd 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 1st 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.

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NIGHT SKY NETWORK –
Open Position

WEBMASTER JENNIFER JONES

MEMBER ARTICLES WANTED

Have YOU HAD A FUN ASTRONOMICAL ADVENTURE?

Got a new piece of equipment your dying to brag about?

Been on a vacation to an astronomical destination or done stargazing along the way.

Want to share your latest astrophotography success

Contact our Newsletter Editor about details at
Tulsaastrobiz@gmail.com

Submissions should be in MS Word and submitted by the 20th of each month.

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