ASTRONOMY CLUB 89 Yrs OF TULSA

OBSERVER

June 2026

Bringing Stars to the eyes of Tulsa since 1937

Editor – John Land

SH2-274, the Medusa Nebula by Tim Gilliland

The Medusa Nebula is an old planetary nebula some 1,500 light-years away in the constellation Gemini estimated to be over 4 light-years across. The planetary nebula phase represents a final stage in the evolution of low mass stars like the sun as they transform themselves from red giants to hot white dwarf stars and in the process shrug off their outer layers. Ultraviolet radiation from the hot star powers the nebular glow.

Tim made this image Feb 15, 2026 with his Celestron EdgeHD 11" telescope using his SBIG ST 8300M camera. It is composed of exposures – H-Alpha 3 hours 30' and OIII 3 hours. Processed with Pleiades Astrophoto PixInsight software
Tim images from his "Hardhat Observatory" near Keystone lake

Follow Us On Social Media

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

Scott Bratt reports there has been a lot of activity on our public Facebook in the last 28 days.
Views have been up by 140% -- 115,766 views with 6,556 followers

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

Join us as we celebrate the Summer Solstice weekend on

Saturday June 20 – 8:15 PM - Case Community Center Public Telescope Night
1050 W Wekiwa Rd, Sand Springs

Guest and member Observatory nights

FRIDAY June 5 - 8:00 PM Guest & Members Night

FRIDAY July 10 - 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 June 12 - 8:00 PM Members Observatory Night

Friday July 17 - 7:45 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

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.

Get your Registrations in soon

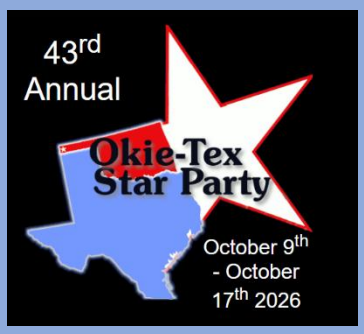
2026 MidStates Regional Astronomy Conference June 26 to 28
in St. Charles, Missouri.
https://www.asemonline.org/2026-msral Hosted by the Astronomical Society of Eastern Missouri, this three-day event will include a Friday evening StarBQ and observing session, followed by convention programming on Saturday and Sunday. The speaker lineup is shaping up to be exceptional, with presentations covering the story of Gus Grissom, comets and the origins of life, the Vera Rubin Observatory, and the hidden geology of the Moon

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.

Salutations all,

By the time you're reading this message, we should be close to — if not already fully into — June, which means summer astronomy season is officially beginning to swing into full gear. Warmer nights, late sunsets, mosquitoes the size of small drones, and telescopes pointed skyward until the early morning hours… truly a magical time of year.

First and foremost, I would like to sincerely thank all of you — whether you're a brand-new member, longtime volunteer, or lifelong observer with the club — for your support, advocacy, and efforts concerning the Jenks Public Schools decision regarding the Jenks Planetarium. While the final outcome was not what many of us had hoped for concerning broader public access, the school board did ultimately agree to keep the planetarium operational for students and faculty. Now, in what exact capacity that operation will continue remains to be seen.

But what I can assure you of is this: the conversation surrounding the future of the planetarium is far from over. And if — or perhaps when — discussions arise again about permanently closing its doors, this club will be ready. We will advocate twice as hard, educate thrice as much, and continue raising enough awareness and public support that the importance of the planetarium cannot simply be overlooked or quietly dismissed.

What this experience demonstrated to me more than anything else was just how deeply this community cares about science education, astronomy outreach, and preserving spaces that inspire curiosity. Seeing club members, educators, students, parents, and community supporters rally together reminded me exactly why organizations like ours matter. So again, thank you all. **I have a feeling this will not be the last chapter in that story.**

Now, onto more club updates and happenings.

With the uncertainty surrounding future access to the Jenks Planetarium for meetings, the board has begun investigating alternative locations for our typical in-person gatherings. While, to this astronomy club President, it feels almost like a cardinal sin to hold an astronomy club meeting anywhere other than beneath a planetarium dome, we are actively exploring possibilities including local libraries, public meeting spaces, and even potentially collaborating with the Tulsa Air and Space Museum planetarium for future meetings. More details on that front will follow as Summer continues to unfold.

Speaking of Summer, don't forget about the upcoming
76th Mid-States Region Astronomical League (MSRAL) Convention
happening June 26–28, 2026, in St. Charles, Missouri.
The 2026 convention will be hosted by the Astronomical Society of Eastern Missouri (ASEM) and looks to be an incredible weekend filled with observing, presentations, outreach, and astronomy fellowship. The event spans three days and includes:

- A Friday evening StarBQ at Broemmelsiek Park Visitor Center followed by telescope observing at the Broemmelsiek Park Astronomy Site
- Saturday convention events at St. Charles Community College
- Sunday convention activities at the Weldon Spring Site Interpretive Center

If you're interested in attending or registering, please visit the convention website for additional details: https://www.asemonline.org/2026-msral

As our outreach efforts continue to grow, so too does the outpouring of community support, collaboration opportunities, and partnerships the club has begun making throughout the Tulsa area. It has honestly been incredible to watch.

Recently, the Astronomy Club of Tulsa was invited by the **Owasso Parks Department** to participate in their public **Community Movie Night featuring The Super Mario Bros. Movie on Saturday, July 18th at Redbud Festival Park at 7:00 PM**. Much like our recent Interstellar outreach event at Guthrie Green, we'll be there interacting with the public, answering astronomy questions, discussing upcoming celestial events, and of course bringing telescopes out for the community to enjoy. Events like these are incredibly important because they place astronomy directly into the public eye in fun, approachable, and family-friendly ways. Sometimes all it takes is one person looking through a telescope for the very first time to spark a lifelong fascination with science and space.

Additionally, Jonathan Neff, CEO of **NEFF Brewing** in downtown Tulsa, recently reached out regarding a collaborative outreach opportunity with his establishment centered around an "Astronomy on Tap" style event. For those unfamiliar with the concept, Astronomy on Tap events are casual public gatherings typically hosted at restaurants, breweries, pubs, or community venues where attendees can enjoy short, engaging TED Talk-style presentations on astronomy and space-related topics in a relaxed, low-barrier environment. The goal is simple: make astronomy approachable, social, and fun for people who may never otherwise attend a formal science lecture or observatory night.

This upcoming event will serve as a trial run to explore whether something more permanent or recurring could make sense in the future, but regardless, it presents another excellent opportunity — much like Guthrie Green — for our club to directly engage with people in the heart of Tulsa and continue growing awareness of both astronomy and the club itself.

The event is currently scheduled for **Thursday, July 23rd at 8:30 PM** in conjunction with NEFF Brewing's annual Apollo 11 anniversary celebration, which should make for an especially exciting and fitting evening under the summer sky. Between the Apollo anniversary theme, astronomy discussions, community outreach, and telescope observing afterward, I think it has the potential to become a truly memorable event. I'd also like to put out a call for volunteers as we continue restoration and improvement work on the observatory dome itself**. On June 13th, we'll be holding another club workday at the observatory** focused primarily on the interior of the dome — repairing areas where paint has begun chipping, repainting sections of the interior, and scrubbing away years of accumulated dirt and grime.

Like many observatories, our dome has weathered countless nights of wind, dust, humidity, and Oklahoma temperature swings, and keeping it maintained is an ongoing labor of love. Any help on this day would be greatly appreciated and warmly welcomed, whether you can stay for an hour or the whole day. No special skills required — just a willingness to lend a hand and help preserve one of the club's most important spaces. And don't worry… all volunteers will, of course, be compensated handsomely in pizza for their heroic efforts.

Lastly, on a more personal note, I also want to say how proud I've been watching this club continue to evolve over the last year. Outreach events have grown, public engagement has increased dramatically, new members continue finding their way into our astronomy family, and the observatory grounds themselves continue improving thanks to countless volunteer hours you all have been putting in. The momentum we're building right now is exciting, and I genuinely believe we are laying the groundwork for something very special as we approach the club's 90th anniversary in 2027.

As always, keep an eye on the website and social media pages for upcoming guest nights, outreach opportunities, volunteer events, and meeting announcements. Summer is one of our best seasons, and there

will be no shortage of opportunities to get involved, look through a telescope, ask questions, help with outreach, or simply spend an evening under the stars with fellow astronomy enthusiasts.

Until next time, this is Jonathan Fussell, currently somewhere between Enceladus and Titan, asking the all-important question: if methane-based lifeforms exist, do they constantly complain that their food needs more salt?

After all, salts don't dissolve very well in liquid methane the way they do in water — methane is non-polar, salts are ionic, and this chemistry may be tragically inconvenient for alien cuisine.
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

***** 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

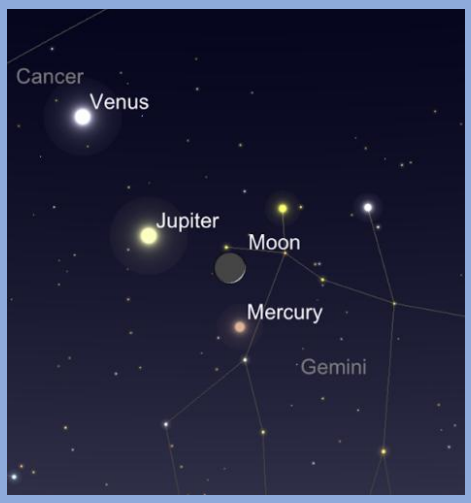
Daily Moon Guide | Observe – Moon: NASA Science

March - Moon Phases - -
3rd Q - - Mon June 08 - - New Sun June 14 -- 1st Q Sun June 21 Full Mon June 29

Lunar conjunctions – Morning Saturn - Neptune Weds June 10 - 4:00 AM
Mars Fri June 12 5 AM, Pleiades Sat June 13

The moon and planets provide some nice evening photo op observing events in June. First off the two brightest planets Venus & Jupiter pass within 2 degrees of each other the evenings of June 8, 9 & 10. The two will drift farther apart as Mercury slips in below.

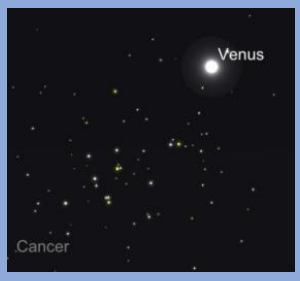
The thin waxing crescent moon visits a trio of planets on June 16 & 17.



On June 15: Mercury at Greatest Elongation East makes its best evening appearance of the year for several days in mid-June. Look for it below Jupiter in the evening twilight. Binoculars may help you locate it.

June is the final month for enjoying Jupiter and its moons in the evening sky. Try interactive Jupiter Moon Calculator

Explore Astronomical League has a wide variety of Observing Certificate Programs



After sunset on June 19th Venus will pass about one degree from the M 44 the Beehive cluster in Cancer.

Enjoy the Strawberry Moon on June 29. This full moon will appear smaller than average as the moon is at its furthest distance from Earth on the 28th -- a "Micromoon"

This year the summer Solstice occurs on Father's Day on June 21st at 3:24 AM CDT Sunrise will be at 6:05 and Sets at 20:42 giving the Tulsa area 14 hrs 37 mins of daylight. Learn more about the Solstice

Venus in the daytime: Best ways to see it

The recent release of the UFO files has sparked a lot of interest and speculation.
A number of those can be attributed to sightings of Venus during the daytime.

A WW II historical antidote involved a sighting by the US Navy Battleship New York of a luminous object following the ship. Thinking it was some sort of Japanese secret weapon they fired nearly 300 rounds trying to shoot it down. Finally, the navigator came on deck and pointed out they were trying to shoot down VENUS !! Read more historical daytime sightings of Venus.

DAYTIME VENUS OCCULTATION

On Weds June 17th you have an excellent opportunity to see a Venus in the daytime. For Tulsa the occultation begins about 2:07 PM as Venus disappears on the dark limb of the 3-day old crescent moon. Then reappear about 3:41 PM on the bright limb. Your time will vary a bit depending on your location.

Plan to be set up to begin observing about 1:45 PM. For safety position yourself in the shadow on the east side of a building so that you don't accidentally look toward the sun. Look of the moon about 60 degrees up a bit south of East. Approximately Altitude 60 Azimuth 110 You should be able to locate the moon naked eye, but binoculars or a low power telescope may help in locating Venus below the moon. If the sky is clear, you should be able to see Venus naked eye as well. The times I have observed Venus in the daylight it reminded me of some tiny silver balloon that had escaped a kid at the fair. Once you have located it watch as the moon slowly slips toward and hides Venus. If you are trying to use a GoTo scope set up early and tell it to find the moon. Then switch and tell it to center on Venus. After the occultation try to find Venus again to the left of the moon. How long can you follow it during daylight? See if you can locate Venus at 2:00 PM the next day at about the same location without the moon as a marker.

Astronomy in the News & Extreme Astrophotography

These are selections of astronomy related articles I have enjoyed recently.

A Mars Rover Found Building Blocks of Life Never Seen on the Red Planet Before, Boosting the Case for Ancient Habitability - Smithsonian
https://apple.news/AVJTNYdlkSiqxVX2WktSVSQ

Astronomers map one of the largest structures in the universe, hidden behind the Milky Way's 'Zone of Avoidance' - Live Science
https://apple.news/AnBtwIr7GTv-dV2Iu2ZhS8Q

Our Milky Way's 'Zone of Avoidance' holds a galaxy supercluster with 30,000 trillion times the sun's mass - Space https://apple.news/AHtQCTivYRJOkhA7NItzEIQ

NASA's Curiosity and Perseverance rovers capture sweeping Mars panoramas (video) - Space https://apple.news/ADBhxdsIsQo-IXhHiHHVmdg

Astronomers believe they've detected an atmosphere around a tiny, icy world beyond Pluto - The Associated Press https://apple.news/A-ZJ-KAHUSnaiH_XpmYfwNQ

The Universe In 25 Photos Captured By The Finalists Of The Milky Way Photographer Of The Year Contest - AOL https://www.boredpanda.com/milky-way-photos-capture-the-atlas/ https://www.aol.com/articles/milky-way-photographer-25-stunning-093631132.html

See Artemis 2's amazing views of Earth in timelapse video taken from 12,000-photo drop - Space https://apple.news/AX6qGsx0uRhS3PA17hBJCAw

Wild new 'Skyfall' Mars mission would drop 6 scout helicopters onto the Red Planet from the air - Space https://apple.news/AvWsfmZC4S46uGxfJ_zT9IA

The Challenge of Messier 102

Background

"Anyone who has never made a mistake has never tried anything new." - Albert Einstein

Comet hunter Charles Messier established a list of deep sky objects that he worried might be confused with comets in the 18th century - the famous Messier Catalog. Messier 102 (M102) is a galaxy listed in the Messier Catalogue that cannot be unambiguously identified. Its original discoverer Pierre Méchain retracted his discovery of M102 two years after publication and said that it was a duplicate observation of Messier 101, a large and beautiful face on spiral galaxy located near the eastern end of the Big Dipper. This image of M101 is by Scott Bratt, using his Seestar S 50:

Later historical evidence favors M102 as the galaxy NGC* 5866 (a match which NASA accepts), although other galaxies have been suggested as possible . These are based on assumptions about the positional error made at discovery or transfer of data across time and observers. None of the M102 candidates (besides M101) is close in size or brightness to M101, so only exact duplication would occur as an error in appearance.

*Refers to the New General Catalog, an exhaustive list of deep sky objects

Astronomical League Observing Challenge

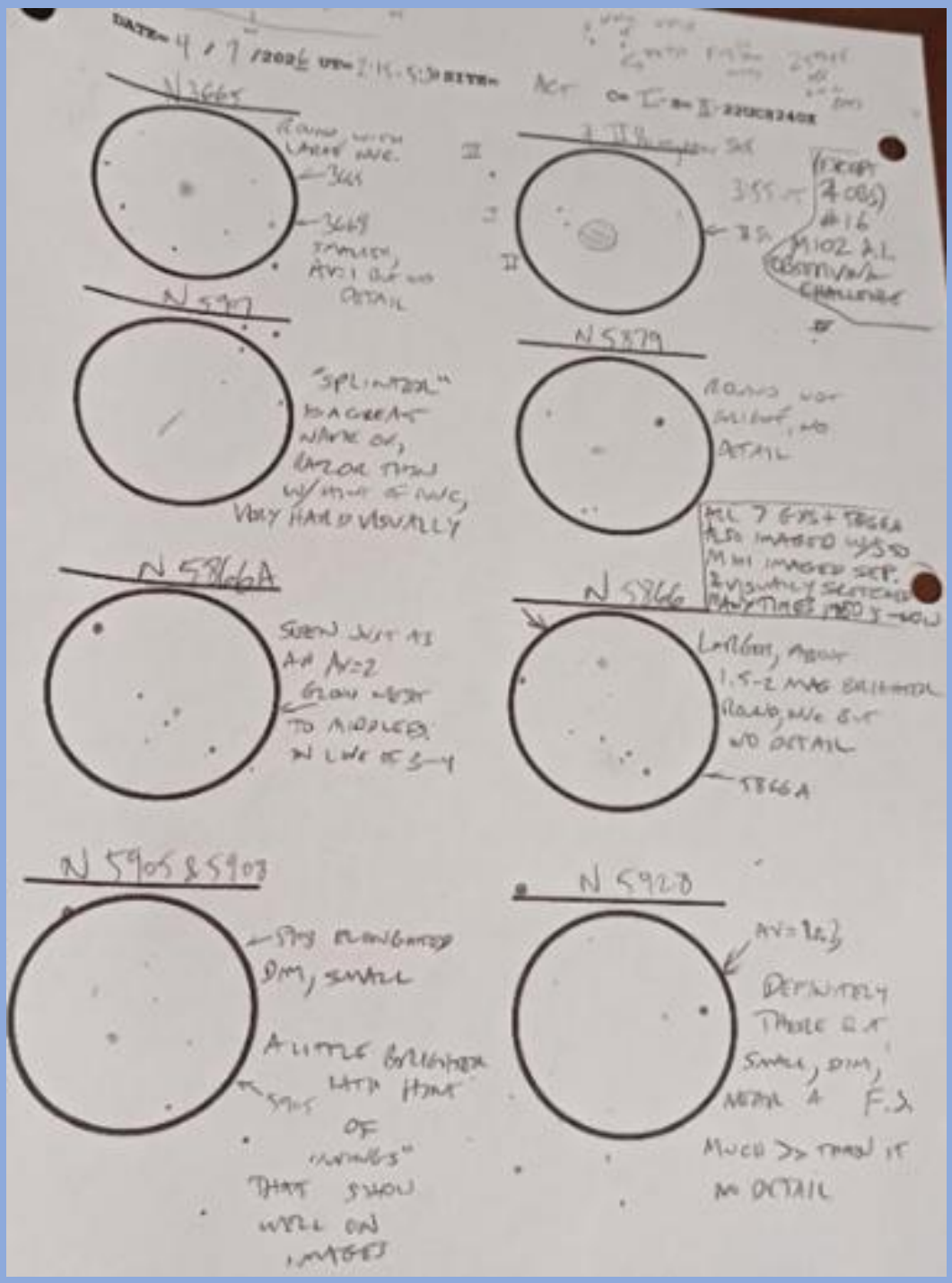
Author note: This is Challenge #16, located at https://www.astroleague.org/al-observing-challenge-special-observing-award/

The purpose of challenge #16 is to observe all the candidates and choose which galaxy near M101 you think presents the best case for being M102. There are several rules about when you can observe (June only), and what activities must be completed and submitted by July 31, 2026. You receive a certificate if completed, but even if you just look at them casually, they represent part of an interesting historical puzzle. Much like Messier 40, a faint double star in the same constellation of Ursa Major, M73 (four faint stars), and the many strange NERFMS© (never existed, real faint, or multiple stars) that fudge up the NGC catalog, these indicate the problems of human analog records. Of course, there are lots of digital records made by non-humans that are also problematic, such as the current top 40 songs on Spotify.

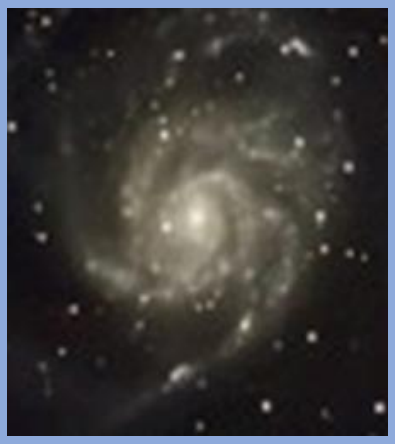
The Astronomical League Observing challenges webpage (listed above) includes a link to a short paper discussing the evidence for each galaxy. The eight on the list are shown in order with the images below. The case for M101 is simple duplication. Others have geometry with field stars etc. that may make sense for an error in recording position. And there are those that are similar in appearance to others nearby, another source of misidentification. Many other galaxies not on the list lie close to M101, and within M101 there are knots of nebulosity (stellar nurseries, globular clusters, etc.) that could be even more possible answers, but since the original entry was clearly not within M101 or very close to it, those objects (many of them in the NGC catalog) can be dismissed.

Observation and Imaging

The challenge may be completed with either visual observations and logs / sketches, or with imaging. I decided to try both. The images and sketches below are by the author, and the images replicate the order listed above M101, NGC 5866, NGC 5879, NGC 5905, NGC 5907, NGC 5908, NGC 3665, and NGC 5928. The sketches were made using my 22" Obsession UC, with 10mm Ethos eyepiece, giving 240x. The images used my Seestar S 50, with various numbers of 10s subs.


DATE= 4 / 7 /2024 UT= 2:15-5:30 SITE=
N 5866
ROUND WITH LARGE NUC.
366
369
SMALLER, AV:1 BUT NO DETAIL
N 5907
"SPLINTER" TO A GREAT NAME OF, RAZOR THIN W/ HINT OF NUC, VERY HARD VISUALLY
N 5866A
SEEN JUST AT AV=2
GLOW NEXT TO MODEL? IN LINE OF 3-4
N 5905 & 5903
SPIN ELONGATED DIM, SMALL
A LITTLE BRIGHTER WITH HINT OF "WINGS" THAT SHOW WELL ON IMAGES
ACT
355
N 5879
ROUND NOT BRIGHT, NO DETAIL
ALL 7 GSC+ STARS ALSO IMAGED W/ S50 M101 IMAGED SEP. 2 VISUALLY SKETCHED MANY TIMES IMG'D 3-NOW
N 5866
LARGER, ABOUT 1.5-2 MAG BRIGHTER ROUND, NUC & NO DETAIL
5866A
N 5928
AV=1.2
DEFINITELY THERE AT SMALL, DIM, NEAR A F.S
MUCH >> THAN IT IN DETAIL

Images M101, NGC 5866, NGC 5879, NGC 5905, NGC 5907, NGC 5908, NGC 3665, and NGC 5928



Historical View

"In general, life is better than it has ever been, and if you think that, in the past, there was some golden age of pleasure and plenty to which you would, if you were able, transport yourself, let me say one single word: Dentistry." - All the Trouble in the World: The Lighter Side of Overpopulation, Famine, Ecological Disaster, Ethnic Hatred, Plague, and Poverty, P.J. O'Rourke, p.2, 2007.

https://www.astroleague.org/wp-content/uploads/2026/03/M102-Messiers-Unknown-Journey.pdf - found linked on the AL webpage - gives quite a lot of historical info, has listed sources, and is a good template for your own take on the individual galaxies. Additional sources are listed below, of a more observational scope, to help you find the targets.

As with most debates about centuries-old records, there are no definite answers here. However, at least to me, after looking at the appearance of each, where they "ride" in the sky relative to the stars in the original entry by Méchain, and my experience with sketching and cataloging more than ten thousand deep sky objects, the answer is simple.

My Choice

"We are our choices." - Jean-Paul Sartre

To me, M102 is M101. When I began astronomy as a teenager, this was the only answer I saw in the books and catalogs I read. I see this as a simple mistake, somewhere between Méchain publishing its discovery, Messier's copying to his own notes, Méchain's retraction, and Pierre's unambiguous assertion that it was simply a duplication of his observation of M101.

The idea that later historical evidence favors M102 as the galaxy NGC 5866 is enough for second place in my mind, mainly because it is the explanation accepted by NASA. One basis for this selection is the appearance of NGC 5866 as bright, but nothing like the famous "Pinwheel Galaxy" M101. True, but visual descriptions of nebulous objects are famously subjective and prone to error and sky conditions. The use of certain field stars to triangulate the position is accepted in this case while errors with field stars are noted as reasons to doubt M102's ID by historical reviewers.

The other galaxies, I think, can be dismissed out of hand, as they don't have the appearance to favor duplication or anything regarding their appearance or field star geometry to prop them up as winners, at least no better than NGC 5866. The fun part here is that we really won't ever know for sure, unless more documents are found.

June is the Month

"How dreary to be some-body, how public, like a frog!
To tell one's name, the live-long June, to an admiring bog" – *I'm Nobody! Who are you?* - Emily Dickinson

So, if you would like to take this observing challenge, look up the links and read the rules carefully. Otherwise, you can make up your own rules and do it your way; it's all up to you. But, for the program June is the month to do the observations. And, even if you are looking casually, the best months for these northern objects are March – August. If you do try to see these, with or without submitting for a certificate, let me know what you think. My email address is hafsnt1@gmail.com

Author's note – my sketches and images were from before the allowable period to get this article out; however, I do not expect any of the objects will have changed very much…

Sources:

Burnham's Celestial Handbook, vol. 3, p. 2021-2022, Robert Burnham, Jr., 1978.
The Messier Album, p. 182, J. H. Mallas and Evered Kreimer, 1978.
Webb Society Deep-Sky Observer's Handbook, vol. 4, "Galaxies", p.143, Kenneth Glyn Jones, ed. 1981.
"M102: Mystery Solved", Sky and Telescope, volume 109, number 3, page 78, , Stephen James O'Meara, March 2005
"Messier 102. An article on the controversy", messier.seds.org. Hartmut Frommert, (web: October 2018) [print: May 1995].
"Messier 102 (The Spindle Galaxy)", science.nasa.gov, Rob Garner, (22 October 2019)

May has been a busy month for our Astronomy Club

Our May Club meeting was well attended. At the end of the meeting the club presented the planetarium director Dan Zielinski with a warm Thank You for his many years of graciously hosting our meeting the past 11 years. Our president Jonathan presented him an illuminated glass etching of the planetarium dome.

Astronomy at Guthrie Greens - April 24

On Friday April 24 our astronomy club was invited to set up telescopes at Guthrie Greens as part of their public movie night. According to estimates approximately 2,000 people gathered to watch the movie *"Interstellar"* and to enjoy the views through some of our telescopes.

May 7 - Great day at Stone Haven Assisted Living & Memory Care

Two Solar telescopes, two SeeStars with Solar Filters on the sun, C 8” locked on Venus.
Thanks Don & Susan Sailing, Cathy Grounds, Dennis McLindon, Scott and Kit Bratt

Justin Faulk - Cake Pan bearings for a 10” Dob

I wanted to upgrade my homemade 10" Dobsonian bearings, my original design I used for 20 years was a piece of 6" PCV drainpipe with Formica glued to the edge - it worked, but it wasn't the best and a larger bearing would give smoother motion. After giving it some thought, I realized a straight edged cake pan would be perfect - already round, available in many sizes and the machined aluminum edge rides nicely on Teflon. I used American Metalcraft HA5110, which is 10" x 1.5", made of heavy duty 14-gauge aluminum, and has straight edges (critical for this function).

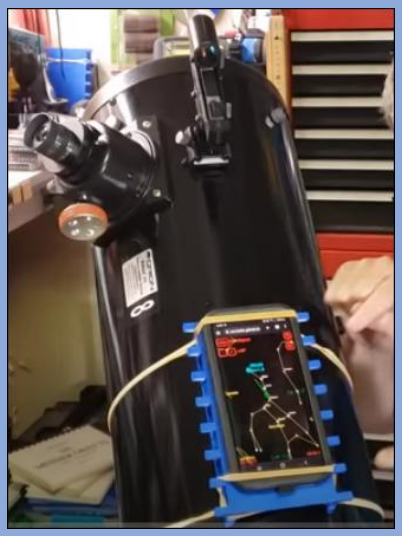
I drilled holes with a drill press and mounted some wood spacers to hold it steady against the sonotube. Foam weather stripping between the plywood and tube keeps it in place better and keeps the wood from scuffing up the sonotube. The pan is attached to the sonotube with two bolts, and four other bolts hold the wood spacers in place.

I also affixed the outdoor temperature probe of an indoor/outdoor thermometer to the back of the mirror, so I can get an idea of what the mirror temperature is compared to the ambient temperature. The thermometer display also sits in the cake pan bearing, since it's right at the balance point, I can add whatever accessories/gadgets I want inside the pans without messing up the balance.

The performance is great - better than I could imagine. The uncoated aluminum rides perfectly on the Teflon pads, and the large bearing diameter make precise small movements a breeze.

In addition to the cake pan bearing upgrade, I also redesigned the primary mirror cell. The new cell is lighter, has a floating mirror design (vs. the silicone that I used before) and has two fans - a fan to force air onto the mirror, and a small boundary layer fan that blows air across the mirror face. The fan wires come out in the center of one of the cake pans, where they go through an adjustable step-up voltage regulator, and individually get switched on and off with a small USB hub (blue LEDs replaced with dim red LEDs). Both fans are powered by one USB backup battery (the adjustable step-up regulator provides up to 12v from the 5v input).

Editor Note: Here is the website for ordering the cake pans. You may want to team up and make a multiple order as the shipping cost for just two pans is more than the cost of two pans.
https://www.webstaurantstore.com/10375/cake-pans.html?filter=material:aluminum&filter=style:straight-sides&filter=pan-depth:1&filter=shape:round&vendor=American-Metalcraft



AstroHopper -

Free App to help you move your telescope to selected objects.

At one of our observing nights member James Hines introduced us to a free great phone app that works like a Push-To guide to point your telescope at selected objects. It should work great for any Alto-Az mounted telescope. I have used it with pleasing success on my Dobsonian reflector telescope. To use it you mount your phone on your telescope tube parallel to its axis. James made a simple phone case mounted on a board strapped to his telescope. I made mine but using a dovetail base and a section of a car phone mount. It will slip into any dovetail finder mount on my telescopes. **NOTE:** Do NOT use a MAGNET to attach it to your scope – it will mess with the phones compass orientation

You won't find the app in your App Store – It's a Web based app that you install by going to the website on your phone. Once it is installed it works without any connection to the web. In fact, they have you test it by putting your phone on Airplane mode and turning off your Wi-Fi.

To use it you will still need a finder scope or red dot finder to point your telescope at a brighter star. You will also need some knowledge of the sky, at least being able to identify a several of the brighter stars. Before attaching your phone to the telescope, it helps to wave it around slowly in a figure 8 pattern. This helps to orient the gyroscopes and compass in your smart phone.

Aim your telescope at a bright star in the region of the sky where your desired viewing object is located. Center it in your scope, then look at the phone display screen. If the star your lined up with is not on the view screen scroll around the screen until it shows up. Next Tap Align and then tap on the star your scope is pointed toward. It will go through a 3 second count and center that star on the screen. Then you can type in the search window you target (M 13 etc.) A circle will show up on the screen if a bar showing the directions you need to move the scope toward your target. Move the scope so it is centered on the phone and look in the eyepiece. Using a 1-degree field of view, I found my object to be almost always in view if not dead center. You can then search other objects in that area of the sky. If you move to another area, you probably will need to select a new alignment star.

There are several good YouTube tutorials how to use it.

On your phone open this URL which is a section of the AstroHopper user manual.

https://artyom-beilis.github.io/manual.html#installing-astrohopper

You will want to scroll down to see the instructions for your specific phone type.

See a good review at https://astronomytechnologytoday.com/2022/06/23/astrohopper/

YouTube Tutorials – FYI – each has some ads

Aim Any Telescope With AstroHopper – **< Fun energetic demo**

The Revolutionary New Smartphone App! (It's FREE!) Reflactor

https://www.youtube.com/watch?v=6-_58mSGz1Q

Tutorial by the creator of AstroHopper at https://www.youtube.com/watch?v=AtArqBLWWJ8

Setting Circles for your Dobsonian Telescope

One of our club's newer members, **Mike Bebeau**, shares this excellent tip for modifying his Dobsonian telescope to aid in locating objects in the sky. Mike tells us *"Installing a printed setting circle on my 10-inch Skywatcher telescope has been a game-changer for me! As a beginner, it was just fun to play around with my telescope and I was content to star hop, but I started getting frustrated when I wanted to learn more and narrow in on finding more specific objects.*

I came across a YouTube video that taught me how to create and install a customized setting-circle and it has helped me ton. I no longer have to aimlessly jump from object to object in the sky and I'm learning where things are and how to find them.

I followed the instructions from the Blocklayer site for making the setting circle fit the base of my telescope. Then I downloaded the measurements onto a thumb drive to take to Staples for printing and laminating because our printer wasn't big enough. The cost for both printing and laminating was about $10.00.

I purchased a Klein Digital Angle Guage at Home Depot for $28.00. I attach this to the telescope tube to read the Altitude angle the scope is pointed to. On the base plate is a small two axis bubble level to help level the scope when it is set up. *It's been a big help for finding the altitude of various deep sky objects."*

Mike has also created a nicely designed raised base platform to set his scope on. This helps get the eyepiece up to a comfortable level for viewing without having to bend over for low altitude objects.

To find the sky position of an observing target, Mike uses a smartphone astronomy app. Since the phone has a built in GPS the app gives the **Altitude angle** of the object above zero as well as the **Azimuth direction** angle. North is Zero and South is 180 degrees. Then he moves the scope around until the setting circles match those readings. Doing this should place the desired object near the center of his finder scope and easily located in a low power eyepiece.

GOOD JOB MIKE ! ! Take time to visit with him at the next observing event.

Here is the YouTube video I used to teach me how to make the circle:
https://www.youtube.com/watch?v=bUEhm2fB13M

I used the Blocklayer app to customize and create the setting circle:
https://www.blocklayer.com/protractor-print

To get coordinates of sky objects, I bought the SkySafari Basic app:
https://go2.skysafariastronomy.com/skysafari-7-pro-on-ios-android-macos

Treasurer Report
Cathy Grounds

As of May 21, 2026, we have 153 members with 23 new members this year.
Please welcome new members Mahogany Jones, Malisa Nell, Steven Vangunda, Prince Brown, Matt Sloan, Cathy Carroll, Carson Commer and Jennifer Stauffer

During May we had 46 people contact us on our website about club events, meetings or other topics.

The club has raised $1125 through the surplus scope sale. A few more are still available.

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**

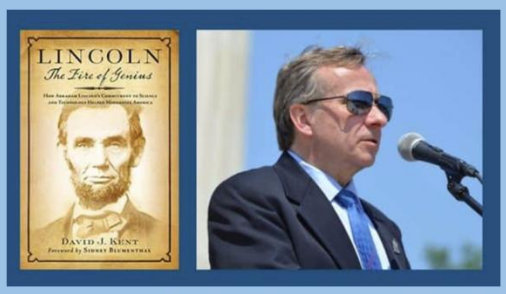
To learn about Astronomy magazine see their home page
Use this **Astronomy Subscription Link** **Digital $ 39.95 Print & Digital $ 49.95** no club discount

Astronomy Club Meetings recordings on YouTube

For our 2026 April 3 and May 1 meetings we experimented with recording them via our ZOOM link. Then converted them to a YouTube video that can be viewed at your convenience later. We used the planetarium's small webcam to record the live speakers. Some of the speakers may be a bit hard to understand**. Take these steps to improve the dialogue**.
Make sure **CC** – Closed Captions are Highlighted Then click **Settings** for English (auto-generated)
It's not perfect but does a good job on most of it.

The beginning of each meetings features club activities, coming sky events and a few smaller presentations. You can scroll forward to just see the main presentation.

April 3rd Recording https://mail.google.com/mail/u/0/?hl=en#sent?projector=1



April 3rd 7:00 PM
Astronomy Club Meeting
Jenks High School Planetarium

Our guest presenter will be David J Kent speaking on Abraham Lincoln's fascination with science and astronomy. Kent describes himself as a former career scientist and global traveler. He has authored 9 books on Abraham Lincoln, Nikola Tesla, and Thomas Edison.

As a leading expert on Lincoln, he was the primary organizer and served as Master of Ceremonies for the Lincoln Memorial Centennial program in 2022.

Our May 1 Recording is https://mail.google.com/mail/u/0/?hl=en#inbox?projector=1

One important segment concerns our club members and community appealing to the Jenks School Board to reconsider the closing of the Jenks Planetarium. JPS voted to keep the planetarium open for students but no longer for the public.

Brad Young's segment on summer sky events was done on the full dome, so you mostly have to listen to his descriptions.

Our President, Jonathan Fussell was the featured presentation.

Jonathan's talk references the AMU – Atomic Mass Unit. – defined as 1/12 of the mass of a Carbon 12 atom It is used to express the incredibly small mass of atoms and molecules. Since C12 has 6 protons & 6 neutrons – less precisely speaking think of it as the sum of the mass of each particle in the nucleus.

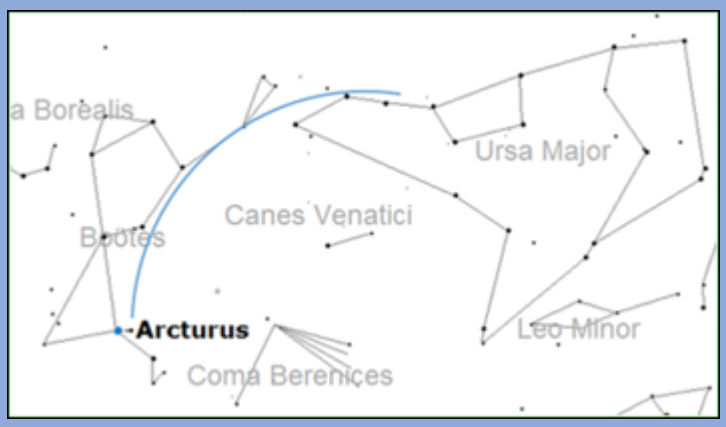
Join us Friday Night May 1st at 7:00 PM at the Jenks High School Planetarium

Does the movie, *Project Hail Mary*, have you thinking about finding friends beyond Earth's atmosphere? Join us as our President, Jonathan Fussell, presents an upcoming publication exploring network reactions in the ocean of Saturn's moon Enceladus and their role in the search for life beyond Earth.

Jonathan is currently a graduate student at Embry-Riddle Aeronautical University studying Space Operations and has spent over three years in astrobiology research. He plans to continue this work by pursuing a PhD focused on characterizing exoplanet atmospheres as the search for life continues.

ARCTURUS – Amber Orange Beacon of the Spring sky.

By John Land



One of my favorite stars, Arcturus, rides high in the springtime sky. To locate Arcturus, find the Big Dipper high overhead in the north then follow the curve of the handle of the Big Dipper and *"Arc to Arcturus"* Shining at magnitude -0.05 it ranks as the fourth brightest of the nighttime sky. Its distinctive orange color makes it stand out among its rivals. Arcturus is the brightest star in the constellation of Boötes, the herdsman.

Its orange color is a result of its cooler surface temperature. Its spectral type is K1.5 III with a temperature of around 4,300 Kelvins. (compared to the Sun's 5,770 K) Kelvin is a temperature scale that starts at Absolute Zero -273 C. While Arcturus is 170 times brighter than the Sun surprisingly its mass is only 1.08 times more than the Sun. The clue to its brilliance can be found in the 2nd part of its spectral classification, the Roman numeral **III**, indicating it belongs to the class of Giant stars. At 25 times the diameter of the sun, its outer surface would fill a quarter of the orbit of Mercury.

As you gaze at Arcturus you can get a glimpse of what our future Sun will be like. Our Sun is about 5 billion years old and derives its energy from the fusion of Hydrogen into Helium in its core at about 15 million K. Arcturus is 7 billion years old and has used up the hydrogen in its core. Helium has settled to its core where it must reach 100 million K before it can begin a carbon fusion cycle. In stars like Arcturus hydrogen fusion is taking place at a furious rate in a shell around the superhot core of helium. All this extra heat causes the star to swell to many times its original size.

I have fond personal connections to the star Arcturus. First of all, it was the first star that my three-year-old daughter, Jennifer learned to recognize. I remember holding her in my arms as she pointed toward the sky and smilingly said "Turus".

The other reason is it gives me a connection to my now departed mother. Mom and I spent many nights looking at the sky and going out to see a satellite. There weren't very many of them in my youth so the weather man would tell us when we could see one. Mom would sometimes tell me the story of how the light from Arcturus was used to turn on the lights for the 1933 Chicago World's Fair (which she got to visit at the age of twelve).

In 1893 Chicago hosted the great Columbian Exposition to show off all the wondrous inventions of the Industrial Revolution era. At the time Arcturus was considered to be 40 light years away, meaning that the light from Arcturus that left in 1893 would just now be arriving at Earth in 1933. The planners of the fair decided it would be a great way to open the fair using the light of Arcturus. North of Chicago was the largest refracting telescope in the world, the 40-inch Yerkes refractor. One of the new inventions was the photocell that could generate electricity when exposed to light and trip an electric switch. Thousands of people gathered for the grand opening on the night of May 27, 1933, as light streaming from Arcturus was fed though the giant refractor onto a sensor that would send a signal to the fairgrounds and turn on the lights.

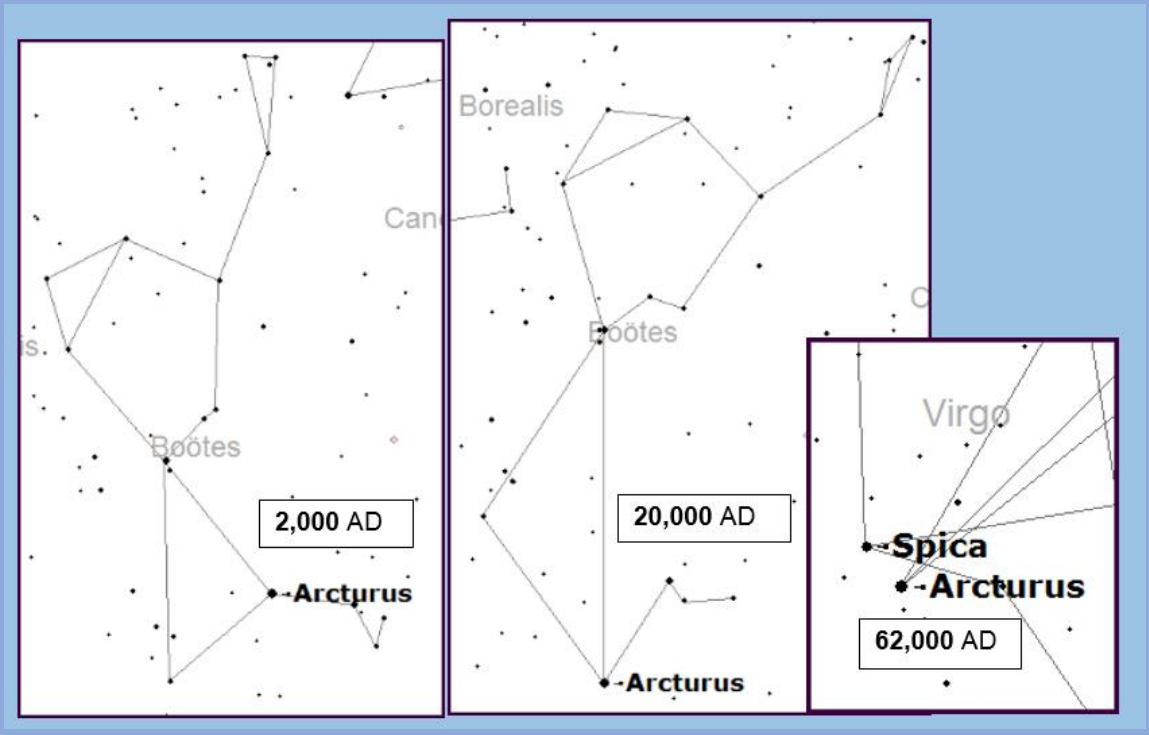
Modern more accurate measurements place the distance of Arcturus at 36.7 Light years.
Also, it turns out they had a backup plan if it was cloudy on the appointed night.
Details at. THE CURIOUS AND CONFOUNDING STORY OF HOW ARCTURUS ELECTRIFIED CHICAGO

One last historical antidote associated with Arcturus. As star gazers we learn the constellations to be able to navigate our way among the stars. The names and myths associated with the constellation patterns date back to ancient times. Some objects like planets, comets and asteroids move against this background of stars but the patterns seem firm and fixed in place. However, we know that we are just a tiny star whirling around in a giant galaxy of stars. Over long periods of time even the positions of the stars relative to each other will change. This movement of stars is called Proper Motion.

Dedicated astronomers have been carefully mapping the stars for many centuries. Each succeeding generation builds on the work of the former to reach an ever higher levels of accuracy. Edmund Halley embarked on a mission to map the stars of the southern hemisphere to aid sailors as they navigated around the world. By 1718 Halley had noticed that Sirius, Arcturus and Aldebaran were over half a degree away from the positions charted by the ancient Greek astronomer Hipparchus roughly 1850 years earlier. Hipparchus made a map of 700 stars and was one of the first to attempt to plot the stars accurately in relation to each other. He introduced the system of magnitude numbers that we still use today to describe how bright a star appears.

One half a degree is about the width of a full moon. However, this half degree could not be ignored testifying to the skill and accuracy of these early charts. Today the GAIA astrometry satellite is measuring the position, parallax, and annual proper motion of 1 billion stars with an accuracy of about 20 microarcseconds. (A microarcseconds is 1 millionth of 1/3,600 of a degree)

Using this type of data even our home computers can run software showing the Proper Motion of the stars over 1,000s of years. The image below was generated with Starry Night Pro.



Resources: http://www.skyandtelescope.com/observing/walking-with-arcturus/
Arc to Arcturus video https://www.youtube.com/watch?v=3_E-0sDp8hk
Numerous Wikipedia pages https://en.wikipedia.org/wiki/List_of_brightest_stars
A WORLD'S FAIR MOMENT: THE STAR THAT CONNECTED 1893 AND 1933

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 Location and Times will be posted once we have details.

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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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