



OBSERVER

March 2024

*Bringing Stars to the eyes of Tulsa
since 1937*

Editor - John Land



Telescope Workshop @ Tulsa Air & Space Museum

Our February Telescope Workshop was a big success. We had 21 groups consisting of 46 people bring their telescopes. Ten of our club member volunteers worked with each group individually to help them learn of to set up their telescope. Learn about the different eyepieces and give them tips on how to get start enjoying observing the night sky.

One of our guests sent us her appreciation.

We really enjoyed the workshop and feel like we know a wee bit more about what we're doing! - - - Thanks for all the tips and links. And thanks for setting up the workshop!

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Observatory Stargazing Nights

Our GUESTS & Members nights are open to anyone. We do ask guests to try to RSVP.
Large groups need to make separate arrangements.

Members Only Nights are Open to members and their family
Details, Times and Direction Maps are posted on our Website

<https://www.astrotulsa.com/events>

Observatory Visitation Star Nights

SATURDAY Mar 2 5:45 PM **Guest and Members Night** -
Guest requested to RSVP -

FRIDAY March 9 5:30 PM **Member night and Messier Marathon** Dusk to dawn
See details later in the newsletter

SUNDAY MARCH 10 DAYLIGHT SAVINGS TIME BEGINS

SATURDAY March 16 7:00 PM Daylight Time
Public Sidewalk Telescope night at Case Community Center [1050 W Wekiwa Rd, Sand Springs](https://www.google.com/maps/place/1050+W+Wekiwa+Rd,+Sand+Springs,+OK)

Vernal Equinox Tuesday March 19 - 10:06 PM CDT [Lean More Here](#)
Date the Sun crossed the Celestial Equator moving north.

Saturday March 23 - 10:00 AM Observatory workday. Various project to do.
Clear some trees and brush, Clean up the Observatory building and yard etc.

Friday March 29 - 7:00 PM Jenks High Planetarium [105 E B St, Jenks, OK](https://www.google.com/maps/place/105+E+B+St,+Jenks,+OK)
We invite both members and guests to join us for our In Person meeting.

Monday April 8 Join Us for the April 8th 95% Solar Eclipse at Guthrie Green !

On April 8th, the Astronomy Club of Tulsa invites guests to join them at Guthrie Green for an unforgettable eclipse experience . From 10:30 a.m. onwards, volunteers will set up telescopes and prepare for the main event, which runs from 12:00 PM to 3:00 PM Maximum at 1:49 PM. Alongside food trucks and live music, attendees can look forward to viewing the eclipse through telescopes and possibly on a large 16 x 9 LED wall, with discussions underway about live streaming the event.

**** You can view the eclipse anywhere using safe solar eclipse viewers**

President's Message

Don Bradford



We are still looking for your questions and comments. I have never talked directly with a member or guest at a club event without hearing a question, need, suggestion or offer to help. So, I must conclude that you either didn't read my message (wouldn't blame you), or you haven't used the club website's "Contact" feature. To submit any type of communication, just go to the top of the webpage, click on "[CONTACT](#)", select "General" and scroll down to enter your information and "message". We want to hear from you!

In the last Newsletter and at the last club meeting, I announced that we were planning an organizational meeting to establish small subgroups focused on special interest topics for the purpose of connecting people of all skill levels who have a common interest in learning and sharing knowledge about a particular topic. We had that meeting on February 24, and established four separate groups: **1. Introduction to Astronomy** (to provide people new to astronomy an opportunity to start their hobby on a solid foundation); **2. Visual Observing Techniques** (to share knowledge and experience about finding and visually observing objects in the sky); **3. Community Outreach** (promoting astronomy to the public including holding sidewalk astronomy events, promoting new dark sky observing sites, etc.);

4. Astrophotography (all aspects of the topic at all skill levels). Plus, the ongoing projects like the observatory upgrades, building and grounds maintenance, existing sidewalk astronomy events planned, Observing nights, eclipse events, etc. are still available and looking for your participation.

Of course, these are broad topics that will likely evolve into separate, more specific subtopics. And more topics will likely be added as interest increases. Sixteen club members (ranging from new members to some of the most experienced members) attended the organizational meeting and joined one or more of these groups. As the organizational phase continues, we want every interested person to participate. You will find specific ways to do that in coming announcements on the website and Newsletters. Also, I plan to announce in emails to the membership the persons to contact and ways to join. Stay tuned for more ways to expand your knowledge and skills in the exciting world of astronomy.

Be sure to continue to check the website and Newsletters for announcements of club events. At the next club meeting on March 29 (changed from the previous scheduled date of March 15) we will see several presentations on the April 8 solar eclipse. Several members are planning to drive to Idabel, OK to view the total eclipse, and drive back on the same day. Fingers are crossed about possible considerable traffic, but you are welcome to join us in Idabel. For information on the precise location and logistics of travel, see the posting on the Astronomy Club, Members Only Facebook Page, or contact us through the "[CONTACT](#)", section of the website.

I look forward to seeing you at one of our many events and projects.

"Bringing Stars to the Eyes of Tulsa since 1937"

Don Bradford - President

Vice President Message Jonathan Fussell



What is This? WIT Object: 008

In the vast tapestry of the cosmos, astronomers occasionally stumble upon celestial enigmas that defy conventional categories. Such is the case with VVV-WIT-08, a peculiar object discovered by the VISTA Variables in the Via Lactea survey (VVV) in 2012. (*VISTA Variables in the Via Lactea (VVV) ESO public near-infrared variability survey of the Galactic bulge and an adjacent area of the southern mid-plane*) This discovery marks the second instance of its kind known to astronomers, and it promises to be particularly spectacular.

VVV-WIT-08, located over 25,000 light-years away in the direction of the Milky Way's center, became the focus of intense scrutiny by a team of astronomers. Using both the VVV project and the Optical Gravitational Lensing Experiment (OGLE), they observed a phenomenon that puzzled even seasoned astronomers. Termed a "blinking giant," VVV-WIT-08 exhibited a brightness pattern reminiscent of a massive star intermittently obscured by a smaller companion object surrounded by an opaque disk. The measurements hinted at the staggering scale of the celestial drama. The primary star, suspected to be a colossal entity around 100 times larger than our sun, undergoes periodic dimming as the smaller companion with its shrouding disk passes in front of it. The perplexity lies in the nature of this companion, which scientists are yet to identify.

Interestingly, this pattern is not entirely unprecedented. Comparable dimming occurs in other celestial duets, such as Epsilon Aurigae, where the brightness halves every 27 years due to a passing dust cloud. The team behind VVV-WIT-08 has identified two more instances of this intriguing blinking giant phenomenon, bringing the total observed to five.

In the recent research exploring the nature of the occulting object causing the observed dipping event, astronomers considered various scenarios, including pre-main-sequence discs, main-sequence discs, white dwarf debris discs, and more. Among the considered scenarios, a disc formed from material stripped from the giant is speculated to be the occulting object, offering a plausible explanation for the observed features. However, challenges arise in explaining the apparent reduction in the size of the giant star. The researchers also consider scenarios involving a black hole or neutron star disc and suggest that long-term, wide-field stellar photometric monitoring may reveal a population of long-period eclipsing binaries composed of late-type giant stars and opaque-disc-hosting companions. Despite the intensive efforts in this study, the researchers acknowledge the need for further work to fully understand the intriguing nature of VVV-WIT-08. In these celestial puzzles, the quest for answers offers the promise of unveiling novel insights into the evolution of such intricate cosmic systems.

Clear skies and Godspeed,
Together, Let's reach for the Stars!
Jonathan Fussell - Vice President



Click on these images to links on the Internet



<https://www.astroleague.org/observing-program-selector-grid/>

*** The NEW **CLEAR OUTSIDE** icon above is a link to an extensive site showing cloud cover %, Seeing, Transparency, Moon Phase, Temp in ° 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/>

February - Moon Phases - -

3rd Q Sunday Mar 3 - - **New Sun** Mar 10 - - **1st Q** Sat Mar 16 - - **Full** Monday Mar 25

MARCH EVENING PLANETS – JUPITER remains as our only bright evening planet hanging about halfway up in the western sky in early March but sinking lower each evening. **MERCURY** emerges as an evening planet low in west. Use your binoculars to scan for it next to a fingernail crescent moon soon after sunset on March 10th. It continues to rise higher each evening reaching it greatest elongation 19° from the Sun on the 24th. If you have a clear western horizon, it can be seen as a “golden” star hanging low in the twilight. Binoculars will aide your search. **URANUS** can be found about 6 degrees above of Jupiter in Aries. The two planets draw closer each night until they pass just 1/2 degree apart on April 20. This 6th magnitude greenish planet can be seen in binoculars or a low power eyepiece. [Chart of Uranus positions](#) [Calculator for Jupiter's](#) moons

MORNING PLANETS - VENUS is still our bright morning star low in the ESE sky before sunrise. **MARS** b has finally emerged into the morning sky however at 1.2 mag it is still hard to see as the sky brightens. On the morning of March 8, the Moon, Venus, and Mars will make a nice triangle in Capricornus. **SATURN** is slowly climbing into the morning sky. On the mornings of March 21 & 22 it will pass within 1 degree of Venus. You'll need a telescope and a clear horizon view to find them. **NEPTUNE** is not visible this month. It passes behind the Sun (superior conjunction) on March 19.



Moon is near Venus- morning of March 8 – Evenings - Mercury March 10 Jupiter March 13

Two Comets visible in moderate sized telescopes

Comet 12P/ Pons-Brooks in the evening and C/2021 S3 (PANSTARRS) in the morning.

Comet 12P / Pons-Brooks is continuing its dive toward the sun. As of Feb 23rd, observers were reporting it as 7th magnitude. It should be on your list to observe at our March observatory nights. It reaches perihelion on April 21st 0.78 AU's from the sun at which time it may reach 4th magnitude. Its closest approach to Earth occurs on June 21 at 1.09 AU's It continues to have periodic outbursts boosting it 3 to 5 magnitudes.



The comet is expected to reach at least 4th magnitude in April and may even be visible near Jupiter during the April 8 Solar Eclipse.

You can keep up with the latest magnitude and sky locations at

- <https://theskylive.com/12p-info>
- <http://astro.vanbuitenen.nl/comet/12>

Comet C/2021 S3 (PANSTARRS) rises about 2:00 AM and is well placed for viewing in the SE before dawn. Current observations place it at 9.5 magnitude. It reached perihelion on Feb 14 and will be closest to Earth on March 14th.

- <https://theskylive.com/c2021s3-info>
- <http://astro.vanbuitenen.nl/comet/2021S3>



Early objects for your Messier Marathon Quest

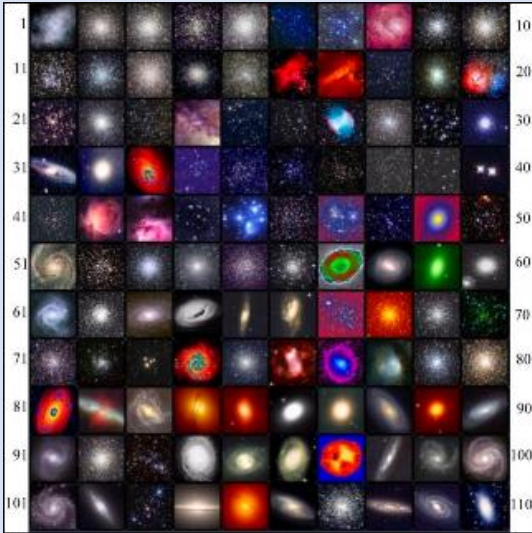
Order	M #	Type	Mag.
1.	M74	SP	9.2
2.	M77	SP	8.8
3.	M33	SP	5.7
4.	M31	SP	3.4
5.	M32	EG	8.2
6.	M110	EG	8.0
7.	M52	OC	6.9
8.	M103	OC	7.4
9.	M76	PN	10.1
10.	M34	OC	5.2

Our March 2 observatory night will be a good practice time to prepare for our Messier Marathon Saturday March 9th.

These are the early objects to find before they set. 9th mag M74 galaxy in Pisces and 9th mag M77 galaxy in Cetus are an early challenge. M 33 in Triangulum will be easier. Then move on familiar M 31 with its companions M 32 & M 110 in Andromeda. M 52 & M 103 are open clusters in Cassiopeia. The 10-mag planetary nebula M 76 at Andromeda's foot will be a challenge. Then move higher up to the open cluster M34 in Perseus.

See more about the Messier Marathon in this newsletter and also, at our Messier Object page at <https://www.astrotulsa.com/messier-objects>

So, dust off your scope, dig out your star charts and get



Are you up for the challenge of the annual Messier Marathon March 9 [See Event Details](#)

Each spring near the Spring Equinox it is possible to find all 110 objects in Charles Messier's Catalogue of Deep Sky Treasures during a single night. Hundreds of amateur astronomers turn their telescopes eagerly toward the sky searching for star clusters, nebula and galaxies hidden in the canopy of the night sky. The quest begins at dusk to catch the ones soon to set it the west. Then proceeds checking off the many objects of the winter and circumpolar sky. You'll need a power snack before tackling the vast denizens of Virgo cluster galaxies. Stave off drowsiness with numerous cups of coffee as the Summer Milky Way rises in the east after midnight. Only the most hardy

observers preserve to catch the objects of the autumn sky before they are swallowed up by the brightening dawn.

The Messier Marathon is a night that club members get together to encourage each other to find as many of the Messier Objects as they can in a single night. Whether you find a few dozen or nearly 100 it's an experience all will enjoy.

The week or so prior to the March New Moon is great time to get started honing your observing skills. Choose a couple of the charts in the links below and try to locate all the objects on that chart. Many of them can be found from suburban skies. Try turning off your GoTo features and find them yourself using the star charts. Our [April 2021 Newsletter](#) has a good article explaining how to find the Field of View in your telescope eyepieces. Then "Star Hop" from a known star to locate your desired object. Just manually use your controls to move the scope until you find the Deep Sky object. Take a bit of time to look observe its details. Maybe even make a sketch of it. If you've never done the [Messier Certificate program](#) this is good time to start but you'll want to spend more time recording your observations for the certificate. Print Off Charts 3,4 & 5 in the link below and see how many you can find.

THE MESSIER MARATHON – extensive page of the history and objects of the marathon
<http://www.messier.seds.org/xtra/marathon/marathon.html> Bottom of the page has links to years.

Excellent Explanation and strategy for planning your observation Sequence

- Note- The resources at the end can now be found online.

<http://www.richardbell.net/marathon.html>

Single Page printout of the Sequence search list

http://www.richardbell.net/files/messier_list.pdf

Messier Marathon Packet - Made in 2016 - its good in 2024 as well

<https://okmcd.com/pub/MessierMarathonCharts.pdf>

Printable PDF charts or ones that can be stored on a computer.

7 pages of Log sheets to check off your progress arranged by sequence and Suggested times for conducting your search.

17 pages of detailed charts showing the location of each object. Identified by sequence number.

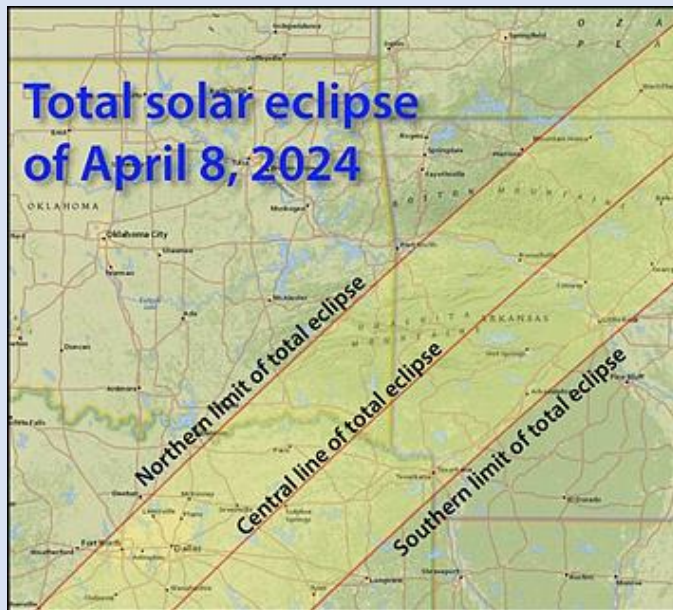
Three Page Log sheets -

<http://www.astunit.com/tonkinsastro/messier/messmara.pdf>

For observers using different instruments during the night
- this one has columns to identify which instrument

USA TOTAL SOLAR ECLIPSE – MONDAY APRIL 8, 2024

This page is a collection of resources about the eclipse from several sources. You will surely see more as the Eclipse approaches. Use good judgement about the source of the information. Social Media is likely not the most reliable source. I hope these help your planning efforts.



On April 8, 2024 Tulsa will experience a 95% partial Solar Eclipse.


Many people will be traveling to the path of the Total Solar Eclipse that sweeps a long path from SW Texas, across the SE tip of Oklahoma, through central Arkansas and on to Maine.

The next Total Eclipse in the USA occurs in Montana and NW border states August 22, 2044. **Tulsa will have a long Total Eclipse Aug 12, 2045 !!**

Click the map or this link to Zoom into a [Google Map style](#) to see exact times for any chosen location in or out of the path of Totality

Save it in your favorites on your phone, computer and other devices as you may need to be mobile on eclipse day.

Event Data for Tulsa area
Subtract 5 hours for Tulsa times

36° 09' 23.71" N <-> 36.15659°	Penumbral duration : 2h 36m 27.9s	Help				
96° 00' 10.74" W <-> -96.00298°	(partial solar eclipse)					
219.0m (719ft)						
Obscuration : 94.964%		Magnitude at maximum : 0.95070				
		Moon/Sun size ratio : 1.05524				
Event (ΔT=69.1s; alt.=219m)	Date	Time (UT)	Alt	Azi	P	V
Start of partial eclipse (C1)	2024/04/08	17:30:41.4	+58.8°	153.0°	224°	03.8
Maximum eclipse (MAX)	2024/04/08	18:48:51.0	+61.0°	191.9°	138°	07.7
End of partial eclipse (C4)	2024/04/08	20:07:09.3	+53.2°	225.2°	054°	11.4

Tulsa Times are:

Begins at 12:30 PM Reaches **Maximum at 1:49 PM** and ends at 3:07 PM

At Maximum eclipse it shows the Sun's Altitude is 61° up just west of South - Azimuth 192°

The [HELP LINK](#) in the top right corner explains all the features and data information. It even has a geolocation feature for active navigation to your eclipse viewing spot.

EYE SAFETY –

Certified Safe Eclipse Glasses or Viewer Cards are essential to observe the eclipse.

These filters block not only Visible light but also Infrared and Ultraviolet light that can damage your eyes. Look for the ISO safety certificate - that block 99.99 % of the sun's various kinds of radiation. Do not attempt to use improvised materials that may make the sun appear darker but do not protect your eyes from the unseen harmful infrared and ultraviolet radiation. The same advice goes for trying to photograph the eclipse with your phone or camera. The sun can quickly damage the sensors in your device. Cameras require a different kind of filter

Be cautious about Online Ads online Ads – In 2017 unsafe “knock off” ones were being sold In Tulsa area Eclipse Glasses can be found (while supplies last) at Tulsa Air and Space Museum, Jenks High school Trojan shop. Also, Home Depot or Lowes may have them.

Note: It is perfectly safe to be out in the sunlight on an eclipse day. It the same sun as any day It just that on eclipse days people want to see what the sun is doing.

NASA – EYE SAFETY VIEWING A SOLAR ECLIPSE

<https://science.nasa.gov/eclipses/future-eclipses/eclipse-2024/safety/>

Here is an article on reliable sources of Safe Tested Material for viewing the Sun.

Suppliers of Safe Solar Filters & Viewers | Solar Eclipse Across America

<https://eclipse.aas.org/resources/solar-filters>

One reliable source our club has used several times is Rainbow Symphony

<https://www.rainbowsymphony.com/collections/eclipse-glasses-safe-solar-viewers>

Other Eclipse Resources - This is a collection of articles I have come across. I haven't read them thoroughly, but they seem to be from reliable sources. J. Land

TULSA ECLIPSE VIEWING OPPORTUNITIES

Monday April 8 Join Us for the April 8th 95% Solar Eclipse at Guthrie Green !

On April 8th, the **Astronomy Club of Tulsa** invites guests to join them at **Guthrie Green** for an unforgettable eclipse experience . From 10:30 a.m. onwards, volunteers will set up telescopes and prepare for the main event, which runs from 12:00 PM to 3:00 PM Maximum at 1:49 PM. Alongside food trucks and live music, attendees can look forward to viewing the eclipse through telescopes and possibly on a large 16 x 9 LED wall, with discussions underway about live streaming the event.

**** You can view the eclipse anywhere using safe solar eclipse viewers**

DISCOVERY LAB <https://www.discoverylab.org/>

- Has plans for eclipse day. Plans include creating a giant set of Solar Eclipse Glasses, on the order of 8 feet across, so whole families will be able to stand in the shadow cast by the glasses and see the eclipse as it unfolds. In addition, we will have educators with demonstrations of pinhole viewing and the geometry of indirect measurement of the diameter of the sun and moon.

EDUCATOR RESOURCES

Eclipses Teaching Resources and Activities for Educators

<https://eclipse.aas.org/sites/eclipse.aas.org/files/Eclipse-Activities-for-Educators.pdf>

[Eclipse Projection with a hand mirror](#) [YouTube Video demo](#)

Hands-On Teacher Tested Activities

<https://www.exploratorium.edu/eclipse/activities>

Total solar eclipse 2024: How to watch online for free | Space

<https://www.space.com/watch-total-solar-eclipse-april-8-online-free-livestreams>

Sights and Sounds of an Eclipse -- [Eclipse Sound Scapes](#) is a national Citizen Science Initiative to observe and record how the world of Nature responds to the mid-day darkening of an eclipse. Look and Listen to the world around you.

Sky and Telescope has an extensive set of links to pages about the eclipse, planning your trip, safety tips, photography tips and more. (Note: some sites have ads)

<https://skyandtelescope.org/total-solar-eclipse-2024/>

TRAVELING TO THE ECLIPSE PATH

FILL UP your CAR and **Pack Food and Drinks** as Cafes and Gas stations in small towns may not be able to serve the large numbers of people coming to the eclipse.

Plan well in advance where you want to go. Many locations are already sold out and camp sites as well. If you plan to drive on Eclipse Day allow at 2 to 3 times your driving time. During the 2017 eclipse major highways in the eclipse zone experienced heavy traffic especially after the eclipse as everyone was headed home at the same time.

Why you don't need to get to the centerline for April's total solar eclipse — and what will happen at the edge | Space

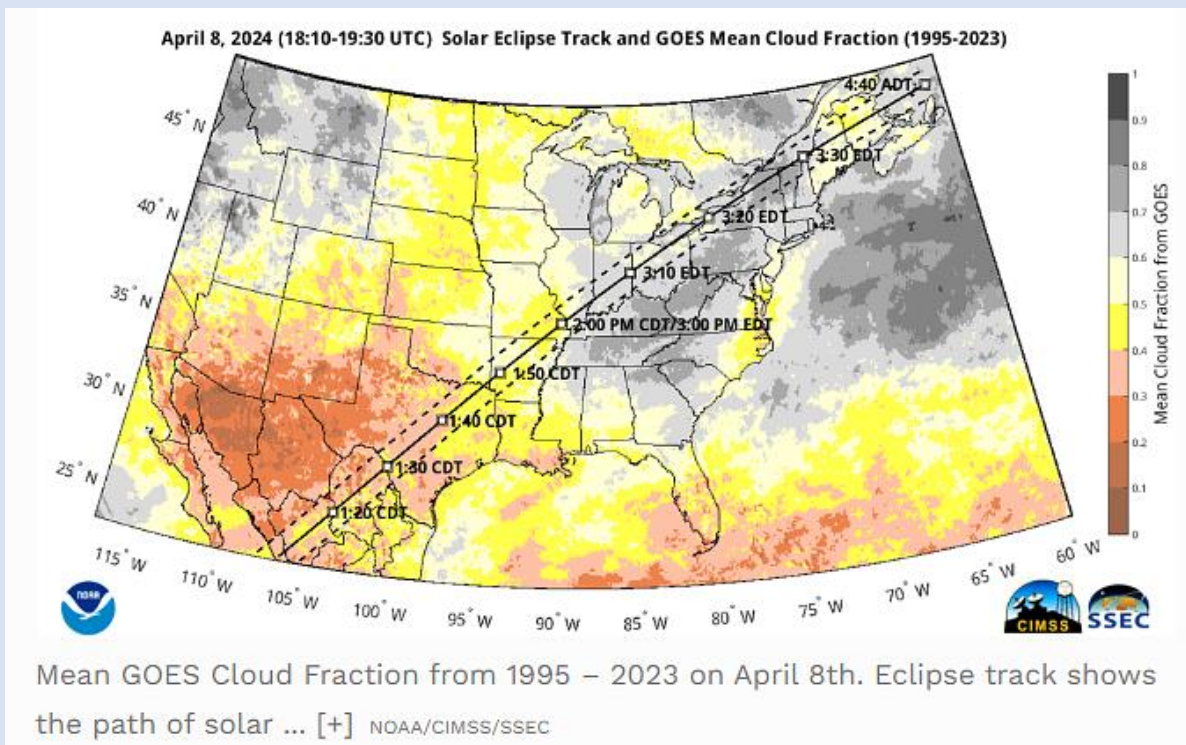
<https://www.space.com/april-2024-total-solar-eclipse-why-to-avoid-the-centerline-of-totality>

25 Tips for the best Eclipse Photos.

<https://www.astronomy.com/observing/25-tips-for-the-best-eclipse-photos/>

Cloud expectations on eclipse day.

1. Start checking local weather forecasts a few days before
2. Remember that the “eclipse cooling” effect of the sun being blocked by the moon can itself cause certain types of clouds to develop.
3. Follow the local meteorologist along the eclipse path on TV.
4. <https://www.accuweather.com/> Lets you choose a location’s forecast and has map options for current cloud conditions.



When is “True” not the “Truth?” or Which Way is North ? By Ed Downs



Terrific! You have just purchased the Super Tech Galactic Star Finder Deluxe which, once aligned with North, will allow you to find even the most distant galaxy in a matter of seconds. Absolutely brilliant ... if only it worked. While getting you close that that long sought-after celestial wonder, it seems like it is always just a bit off. After all, you did the alignment just as instructed, zeroed out North, and waited for technology to do the rest. What could go wrong?

But which North did you use ... True or Magnetic. Yep, just when you think the earth was created “good,” we come to realize that our hemisphere has two North Poles. Earth probably started out really “good,” with only one North Pole. But about 4.5 billion years ago (give or take a billion or so), our brand-new planet had a fender bender with another smaller planet, got knocked silly, about 24 degrees out of line with our orbital plane ... and it wobbles. It appears that the earth’s innards also got a bit addled, so much so that True North (the rotational axis) and Magnetic North (where a compass points) are about 17 degrees apart. Not only is there an angular difference, but the physical location of Magnetic North is about 1200 miles south of the True North pole. So, the question is, did you align with True North, or Magnetic North ... and what is your latitude, as magnetic error increases the closer you get to the True North Pole.? This difference between True North and Magnetic North can be significant, resulting in significant alignment or navigational errors. The phenomenon is called “magnetic variation,” and it differs around the world.

True North is the starting point for earth coordinates plotted by degrees of Longitude and Latitude. Satellites and star charts relate to True North. For we star gazers, True North would Polaris, the “North Star” ... that dim star that only John Land can find given a complete overcast and blindfold ... spooky! While not perfectly situated, Polaris is within about .7 degrees of True North, good enough. Isn’t this “magnetic” versus “true” a problem for sea and aerial navigation, both of which rely on the magnetic compass to fly courses plotted against lines of Longitude, which is pointing at True North? Yep, therefore both sea and aerial navigation charts sport “Isogonic” lines that display the variation within a region. As navigators, we old time pilots (those not flying with a GPS that simply has one following the little picture of an airplane) measure a True Course on a chart (using a line of Longitude) and then apply the magnetic correction value given to us by an Isogonic line. All of our navigation systems are based upon magnetic north, but the GPS is based upon True North, so navigational GPS systems automatically correct for magnetic variation. The “compass” in your cell phone, smart phone or telescope aiming technology can frequently be set to either True or Magnetic. Which one are you using? There are some locations on the earth where True North and Magnetic North are the same. Such locations are displayed through use of an “Agonic” line. The U. S. has one of those running through the Mississippi River Valley area, from north to south ... zero magnetic variation. But fly in the far Northwest or upper Northeast, and Magnetic Variation can exceed 20 degrees. If West of the Mississippi Valley, the magnetic compass points to the East of True North (Easterly Variation). To the East of the Mississippi Valley, the magnetic compass points to the West of True North (Westerly Variation) It gets even a bit more confusing for aviators, in that the numbers painted on a runway are magnetic, as are runway related winds. But NOAA winds are given in True directions. Fun, eh?

But let's get closer to home ... **Tulsa**. Google will tell you that the Magnetic Variation at Tulsa Airport is 2.11 degrees Easterly. The local aviation chart shows an Isogonic line at 2.5 degrees East Magnetic Variation. Let's keep it "pilot simple" and use 2.5 degrees East, which takes latitude into account ... a good number. Assume you wish to point a gadget at the True North Pole (axis of earth rotation) in the middle of the day, with an overcast ... and John is busy. Just get a good magnetic compass, make sure it is level and not close to metal objects or electrical energy. Read what is said carefully and add 2.5 degrees. You will have True North ... see ... simple. The rules are easy. To convert from a Magnetic direction (compass) to a True direction (line of longitude), add Easterly magnetic variation and subtract Westerly magnetic variation. Your cell phone search engine can give you the correct Magnetic Variation for your location. You see, piece of cake!

*NOTE - Ed Downs & John Land have been friends for many years.

About the author, Ed Downs. Ed has been in aviation nearly all his life. Ed worked with both Continental and TWA. While he was at TWA, working under contract for Boeing and Lockheed he did the certification and flight test engineering on the B-747 and L-1011. Although now well past the opportunity to retire, Ed continues sharing his 65 years of flying experience with aviators all over the country. Just last year, Ed taught 35 two-day pilot classes for all pilot's written examinations and conducted private tutoring for advanced technology, antique, warbirds and experimental aircraft. In all, Ed endorsed well over 300 pilots for written examinations and flight test. As a journalist writing for [In Flight USA](#), Ed continues to fight for the "right to flight" and actively participates in local and national airport issues. Oh Yes, some evenings will find Ed enjoying his 12" Dob, seeking adventure "not of this planet."



Telescope Mount for Sale

1) Omni CG-4 Telescope Mount and Tripod- **\$175**

(Purchased new in March 2022 for \$401.46)

-German Equatorial mount and tripod includes RA and DEC slow motion controls and setting circles

- -Adjustable height 1.75" steel leg tripod with center brace/accessory tray
- -2 counterweights- 7 lb. and 4 lb.
- Excellent condition and rarely used, original box and manual included

2) **Free items-**

- Meade DS-2114 reflector telescope incomplete- rebuild or use for parts

-Celestron Nexstar 8 SE mount- for repair or use for parts

-Box of extra accessory items including several finder scopes, misc. mount brackets,

Celestron 1.25" diagonal and 1.25" Celestron 25mm plossl eyepiece

Contact Don Hamilton for additional pictures, further information, and questions

dhamilton721@cox.net

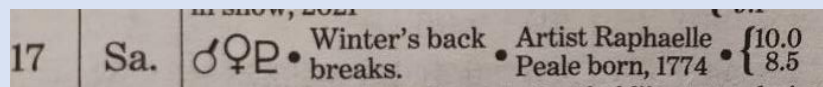
918-855-4683

Observing Chairman Brad Young



Winter's Back Breaks

Each year when I get the new Farmer's Almanac, I turn to the February page to find this listing for the upcoming year. Of course, since the almanac comes out the first Tuesday of September, it seems a bit strange to be looking up this date regarding the winter that's still a ways off. But this is a date I look forward to every year, because by then I'm sick of winter and ready for its back to break. Unfortunately, a wild animal with a broken back will still thrash its tail and spasmodically swipe its claws at everyone around it. Although we have light winters here in Oklahoma, many of our worst winter storms have occurred in March. But normally, the middle of February does represent a good point to talk about the end of a season and whether that end should be celebrated or perhaps is worth just a tinge of regret. Besides, a fresh look may be in order, as the mere thought of breaking winter's back may be cruelty.



2024 date was Feb. 17

Winter certainly represents a low point for most outdoor astronomy. Although some of the clearest, driest nights happen in winter, they're usually also unsteady due to atmospheric turbulence, and of course much colder than I want to be. Nice sunny days in winter may tempt you to go outside that night. But you'll find once the oven door is shut and the sun goes down, the temperature drops quickly in the dry air, and you're left shivering.

However, there are several advantages to the season. You won't have to worry about bug spray. As mentioned, the skies are often clearest of the year. Since we are on standard time and the sun sets early, you can get a whole observing session in and be ready for bed by midnight. And since it's cold there's not much else to do outside that's fun. Perhaps winter isn't such a monster after all, which is why I said that it's passing might be just a little sad.

SPRING REFLECTED IN THE SKY

You can see a metaphor for the seasonal changes played out in the constellations as we look up during Late Winter, Early Spring (when everybody goes to Mexico). We all know the adage that March comes in like a lamb and goes out like a lion, based on Leo rising in the east after Twilight and Aries setting soon after the Sun. This is mimicked by the often-gusty winds of early March and then a more peaceful end to the month as spring starts to show everywhere with daffodils and buds on the tree limbs.



3 Leaps of the Gazelle

Other sky sites that tell us winter is ending is watching the bear Ursa Major rising in the east sort of like a bear decamping from its winter cave and staggering out into the world still half asleep. Caught between this yawning bear and the rising lion Leo a gazelle bounds away, leaving “The Three Leaps of the Gazelle” in the sky (see picture). Leo the Lion is presenting her new spring cub, Leo Minor, just to her north. Ursa Minor, the little bear, also begins to come around behind its mom, I guess a little sleepier than her.

Orion is at his best now right after sunset, and he and his faithful hunting dogs will spend the first half of the night finishing up their winter hunting trip. But if you stay up late, especially in the few days before daylight saving time, you'll notice that Orion, Aldebaran, and the other southern winter constellations are starting to set before midnight now, foreshadowing the upcoming run to the Sun that they will do over the next two months. In March, the big winter “G” [consisting of those stars plus the wide pairs of Castor and Pollux, Menkalinan, and Capella] is already starting to tip over in the early evening. By May, it will be hard to see the western side. In another article I described how [quickly things change in the evening sky in springtime](#). It's almost as if the sky wants to sweep the winter constellations away much as we'd like to put it behind us down on Earth.

PLANET DEARTH

This year there are hardly any planets to be seen until very late. Jupiter and Uranus are still visible low in the evening sky but setting earlier every night as they appear in the area between Cetus and Aries and will be lost in the glare of the Sun mid spring. Mercury will be the only other planet to see for a short evening elongation, as Saturn and all the rest have moved to the morning sky.

CHANGES IN LATITUDE, CHANGES IN ATTITUDE

Each year we spend a lot of time wanting and hoping winter to end instead of enjoying the last taste of the bright winter sky that holds so many good deep sky objects and bright stars. This year, instead of dreaming of spring warmth and hours you season, try enjoying the last few weeks of winter and remember that a couple of months from now you'll be complaining bitterly about how hot it is outside and having to wait until 10:30 for it to get dark.

If you don't think that will work, go someplace crazy south like [Coonabarabran, Australia](#). It's just like western Oklahoma, but has sheep instead of beef. Or go to South Texas or somewhere else warmer and observe there. But if you don't or can't, remember each season has its ups and downs, and maybe it's best to just enjoy them for what they offer.

ADDENDUM

This month's article was supposed to be on a different subject, but events have conspired to keep me too busy to give it the research it needs; maybe next Messier Marathon season I'll get to it. Also, a few bits and pieces here from the February General Meeting:

The Astronomical League has added several new observing programs with a nod to southern hemisphere targets:

HERSCHEL SOUTHERN 400

250 FROM ORIGINAL LISTS

(e.g. if you have done any of the other Herschel programs, or have 250 finished)

Add 150 SOUTHERN OBJECTS to achieve another level and receive a certificate.

BENNETT – 107 (SILVER) certificate or all 152 (GOLD) for a pin. This is a corollary of the Messier list.



BAMBO'S LIST (600 OBJECTS) includes all the southern objects of note, including double stars, variables, and deep sky. I'll see John Bambury here in 2 weeks and hope to interview him and some others at the [Ozsky Star Party](#).
<https://ozsky.org/BAM600/>

John Bambury

SOURCES:

<https://www.constellation-guide.com/three-leaps-of-the-gazelle/>

<https://ozsky.org/>

<https://www.almanac.com/>

Treasurer Report Cathy Grounds



We continue to have a glitch with the PayPal link on our website which is causing problems for new members and renewing members alike. It is primarily associated with the senior membership option and is sometimes charging \$0.49 instead of the \$35.00. I have sent emails to those affected advising of other payment options. We are still working to correct this.

You may receive an email asking about your dues status so please don't be alarmed (or offended) if you receive one of these emails. I am trying to get the clubs records up to date. -if our records don't match yours just send me an email and I will get it sorted out.

Quite a few renewal notices have gone out for expired memberships. We would love to have you continue in our club. Please note that you will be credited a full 12 months going forward from the date you renew.

We are now able to take Point-of-Sale credit card payments via a *SquareUp* card reader. This will be a huge improvement for us and much more convenient. There is a processing fee of roughly 3% added by SquareUp.

As always if you have any questions or concerns or if your Contact Information (Email, Phone, Postal Address) has changed please send me an email at AstroTulsa.Tres@gmail.com

As of February 16, 2024, we had **228 members**, 5 New members in 2024
Let's welcome our newest members Brittany Dias and Ezekiel Cooper!
Our numbers this month are a bit lower due to expirations.

Accounts as of Feb. 16, 2024

Checking: \$3251.24 Savings: \$ 2794.88 Investments: \$34,536.54

You can JOIN or RENEW memberships ONLINE using ANY MAJOR CREDIT CARD or MAILING in your dues with a check. The transactions are processed through PayPal but you DO NOT need a PayPal account. A modest processing fee is added to online transactions.

Fill out the registration form at <https://www.astrotulsa.com/join>

Membership rates for **2024** 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.

MAGAZINE SUBSCRIPTION RATES 2024 updates

A monthly astronomy magazine subscription is a great way to learn more about many aspects of our hobby. -

Scientific articles, sky events, equipment reviews, imaging techniques and more

Use the links below to make your subscription

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



This article is distributed by NASA's Night Sky Network (NSN).

The NSN program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

Constant Companions: Circumpolar Constellations, Part II

By Kat Troche

As the seasons shift from Winter to Spring, heralding in the promise of warmer weather here in the northern hemisphere, our circumpolar constellations remain the same. Depending on your latitude, you will be able to see up to nine circumpolar constellations. This month, we'll focus on: **Lynx, Camelopardalis, and Perseus**. The objects within these constellations can all be spotted with a pair of binoculars or a small to medium-sized telescope, depending on your [Bortle scale](#) – the darkness of your night skies.



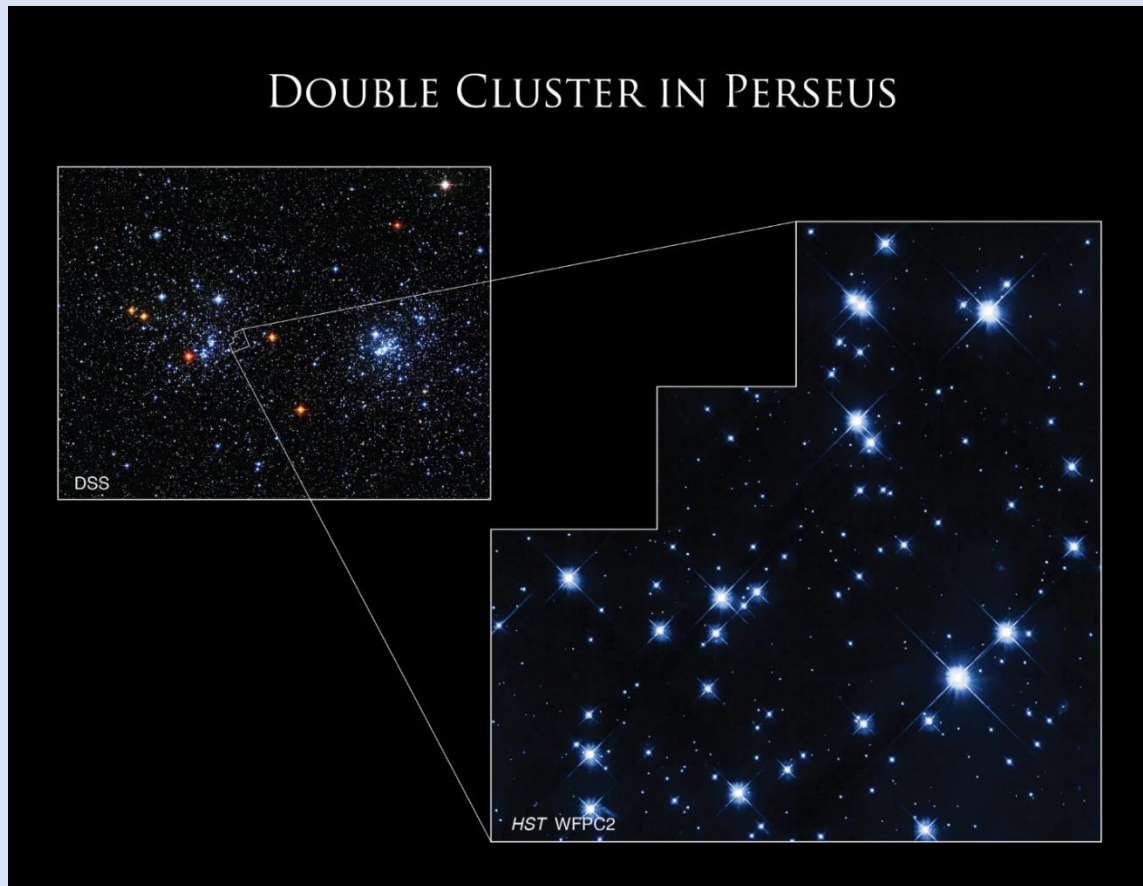
In the appearance of left to right: constellations Perseus, Camelopardalis, and Lynx in the night sky.

Also featured: Cassiopeia as a guide constellation, and Capella as a guide star.

Credit: Stellarium Web

- **Double Stars:** The area that comprises the constellation Lynx is famous for its multiple star systems, all of which can be separated with a telescope under dark skies. Some of the notable stars in Lynx are the following:
 - **12 Lyncis** – a triple star that can be resolved with a medium-sized telescope.
 - **10 Ursae Majoris** – a double star that was once a part of Ursa Major.
 - **38 Lyncis** – a double star that is described as blue-white and lilac.

- **Kemble's Cascade:** This [asterism](#) located in Camelopardalis, has over 20 stars, ranging in visible magnitude (brightness) and temperature. The stars give the appearance of flowing in a straight line leading to the Jolly Roger Cluster (NGC 1502). On the opposite side of this constellation, you find the asterism **Kemble's Kite**. All three objects can be spotted with a pair of binoculars or a telescope and require moderate dark skies.



A ground-based image from the Digitized Sky Survey (DSS) in the upper left shows Caldwell 14, the Double Cluster in Perseus, with an outline of the region imaged by Hubble's Wide Field and Planetary Camera 2 (WFPC2).

Ground-based image: Digitized Sky Survey (DSS); Hubble image: NASA, ESA, and S. Casertano (Space Telescope Science Institute); Processing: Gladys Kober (NASA/Catholic University of America)

- **Double Cluster:** The constellation Perseus contains the beautiful Double Cluster, two open star clusters (NGC 869 and 884) approximately 7,500 light-years from Earth. This object can be spotted with a small telescope or binoculars and is photographed by amateur and professional photographers alike. It can even be seen with the naked eye in very dark skies. Also in Perseus lies **Algol, the Demon Star**. Algol is a triple-star system that contains an eclipsing binary, meaning two of its three stars constantly orbit each other. Because of this orbit, you can watch the brightness dim every two days, 20 hours, 49 minutes – for 10-hour periods at a time. For a visual representation of this, revisit [NASA's What's Up: November 2019](#).

From constellations you can see all year to a once in a lifetime event! Up next, find out how you can partner with NASA volunteers for the April 8, 2024, total solar eclipse with our upcoming mid-month article on the [Night Sky Network](#) page through NASA's website!

You are invited to come 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/>



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](#)



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

Enjoy at Planetarium Show at Jenks High School

JENKS PLANETARIUM



Jenks High School Campus
205 East B Street, Jenks

TICKETS are \$7

See our 2024 Spring Shows
Schedule and ticket purchase
links at

[Shows and Ticket Link](#)

**Shows take place on Tuesday evenings
or Saturday mornings
Must purchase tickets online in advance**

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PR AND OUTREACH – **Open Position**

GROUP DIRECTOR – **Open Position**

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