



OBSERVER

June 2023

Bringing Stars to the eyes of Tulsa

since 1937 Editor - John Land



This lovely image shared with us by Mike Blaylock is the
M 101 – the Pinwheel Galaxy

A beautiful face on galaxy in just the above the handle of the Big Dipper
At a of distance of 21 million Light Years it is a fairly easy target at 7.8 magnitude.

M 101 is making headline news with the discovery of Type II supernova, SN 2023ixf It was discovered by Japanese astronomer Koichi Itagaki May 19. A Type II supernova occurs when a massive star runs out of nuclear fuel. Massive stars begin with hydrogen fusion like all stars but quickly run through that forming a hot helium core. Once that core reaches 100 million Kelvin it begins fusing in Carbon, Oxygen and Nitrogen and onto Carbon fusion at 600 million K. Each of these fusions produces more and more energy. But when it reaches IRON fusion it consumes energy. The core collapses almost instantaneously. The outer layers of the star come crashing down and rebound in a cataclysmic explosion. – A Super Nova

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Astronomy Club Events Check our website AstroTulsa.com events section for updates

Observatory Stargazing Nights

Two types of Observatory nights. During the Summer Months they are scheduled on a Friday.
If weather is poor on Friday, we will try again on Saturday if the weather improves.

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>

NOTE: Events on June 9, 10 & 11 are for pre-registered conference guests only

Hosting MidStates Regional Convention				
June	Friday June 9 - Registrtration 3 to 5 PM			
Jenks HS		Star BBQ 6:00	--- Guests at Observatory 8:00 PM	
Jenks HS	Saturday 10	8:00 to 4:00 Presentations & Vendors		
Jenks High school		6:30 Banquet & Keynote Speaker		
Jenks HS	Sunday 11	8:30 - 11:30 Presentations and Close out		
	Members	Guest Night		Weather backup
Observatory Night	Fri 16	Fri 23	< Moon will be	Nights on Saturday
	20:15	20:15	Waxing Crescent	
	Summer Solstice	June 21st	10:00 AM CDT	
	Full Moon	3rd Quarter	New	First Quarter
	Sat 3	Sat 10	Sat 17	Mon 26
	No Meetings	Guest Night	Members	Weather backup
July	in Summer	Fri 12	Fri 19	Nights on Saturday
Observatory Night		19:45	20:00	
	Full Moon	3rd Quarter	New	First Quarter
	Mon 3	Sun 9	Mon 17	Tues 25

Please Register ASAP - We need firm numbers by June 3

2023 MidStates Regional Astronomical Conference
June 9 – 10 – 11 <http://www.msral2023.org>

See our schedule line up of Speakers

Note: Meal selections paid for separately

Conference Program Line Up

June 9 - Friday – Registration begins at 3:00 PM

6:00 PM – Star-B-Q from Oklahoma Joe's

6:40 Introduction Program and guest speaker Richard Stember

Telling about the [Science Heads Inc.](#) Mobile Observatory concept

Afterwards Guests are invited to caravan to our Observatory southwest of town

June 10 - Saturday Morning Presentations include:

Fred Gassert from Witchita - **Out of the Darkness – Retoring a public observatory**

John Blaesi – Bartlesville - **Dark Sky Parks and Obtaining a
Certified International Dark-Sky Association Designation**

Registrants will be eligible of Door Prize Drawings intermingled during presentation times.

After morning presentations - **GROUP PICTURE** – then during the lunch hour –

Guests may visit the new  Northeast Oklahoma Chapter Mobile observatory

Saturday Afternoon

Byron Labadie - **Astronomy in Chile Educator Ambassador Program**

Plus a planetarium show on the **Big Observatories in Chile**

Rosa Hathaway - **The New Space Economy**

Ms. Hathaway started her career with NASA and
also worked 10 years Space X rocket engines

Brad Young - Tulsa - **Alternate Constellations** – from other cultures

and **John Barentine** – Arizona - **Obsolete Constellations** – patterns no longer used

Saturday Evening Banquet

Keynote Banquet Speaker - **Dr Daniel Kenefick** – University of Arkansas

Multi-Messenger Astronomy: A History of this still-dawning field

Telling us about the new discoveries with Gravity Waves

June 11 Sunday Morning Presentations

Val Germann – Columbia MO - **Astronomy on the Santa Fe and Oregon Trails**

John Moore – Tulsa - **Chasing Shadows - The Exciting World of Occultation Sciences**

Dan Zielinski - Jenks High School student Planetarium Show creations
– **Eclipses Crossing America**

Peggy Walker - **MSRAL Back in the Day**

Adjourn and clean up time

National Astronomical Conference July 26 – 29 in Baton Rouge, LA
Registration is now open at <https://alcon2023.org/>



BIENVENUE EN LOUISIANE! (WELCOME TO LOUISIANA!)
Join us for this unique and exciting amateur astronomy gathering!

ALCON 2023

KEYNOTE SPEAKERS

- ★ David Eicher—writer, editor-in-chief of *Astronomy Magazine*
- ★ Fred Espenak—co-author of *Totality: The Great American Eclipses of 2017 and 2024*
- ★ David Levy—author, comet hunter

FIELD TRIPS

- ★ Irene Pennington Planetarium
- ★ LIGO (Laser Interferometer Gravitational-Wave Observatory) Livingston*
- ★ Louisiana State University Physics & Astronomy
- ★ Highland Road Park Observatory

*Spaces are limited for this trip!

SPEAKERS ★ Pranvera Hyseni ★ Guy Consolmagno ★ Dan Davis ★ And many more!

Brought to Baton Rouge by the **Baton Rouge Astronomical Society**

★★ Registration is now open! Check alcon2023.org ★★

President's Message John Land



As I write this section, the our MidStates Astronomy Conference is only TWO WEEKS away. Our Tulsa club is hosting the conference this year. At this point we have guests from clubs from seven states joining with Oklahoma groups. This will be a good chance to make new friends and exchange ideas.

A special thanks goes to those who have served on our planning team over the past six months.

Mike Blaylock, Donald Bradford, Robert (Bob) Brown, Robert Davenport, Cathy Grounds, Mahogany Jones, Byron Labadie, John Land, John Moore, Jack Reeder, Krystal Reyes, Dana Swift, Brad Young

Let us continue our 85+ years of

"Bringing Stars to the Eyes of Tulsa since 1937"

John Land - President

Our Observatory Manager, James Taggart, has assemble a page that links to all the Zoom recordings of our Jenks meetings.

Collection of Club Zoom Recordings since Dec 2020

<https://www.youtube.com/playlist?list=PLN2wFsTxKXjf6YIUUsJwBBq4UXsvwY3eV5>



Click on these images to links on the Internet



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
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/>

JUNE - Moon Phases -- Full June 3 -- 3rd Q June 10 -- New June 17 -- 1st Q June 20

June planets. - **VENUS** dominates the western evening sky. Due to its brilliance Venus is best observed during bright twilight. As mentioned in my May news, this is a good time to be watching Venus go through its cycle of phases. Continue to observe it throughout the summer. With the late summer sunsets, you'll have to wait until after 9:15 or so to see much dimmer **MARS** lying about 10 degrees to the upper right of Venus. Look for it to pass through M 44 the Beehive Cluster in Cancer June 1-3. Venus skims past the Beehive on the nights of June 12 & 13. See diagrams on the next page. As Venus and Mars pass through Cancer, they draw within 4 degrees of each other in early July but then Venus starts sinking back to the west. The Moon joins makes it a trio on the night of June 21

You must rise early to see Saturn or Jupiter. At Dawn twilight - about 5:00 AM ! **SATURN** is about 40 degrees up in the SE sky. Scientist have just increased its number of know moons to **145** !

JUPITER is brighter about 20 degrees up in the East. The moon is near Saturn June 9 & 10 and Jupiter on June 14th

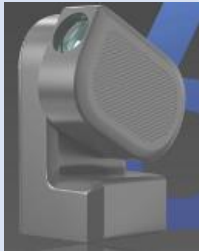
Astronomy in the News - Articles of random interest. Apologies for those that include Ads

- [Bright, young supernova now visible in M101 | Astronomy.com](#) Very Informative article
- [New Discoveries Double Number of "Irregular" Saturn Moons, Bringing Total Count to 145](#)
- [Scientists Confirm: Meteorite Crashed Into New Jersey Home](#)
- [Earth Restored — Toby Ord](#) Images of Earth from Apollo digitally restored and sharpened.
- [How a Dishwasher Engineer Challenged Elon Musk's Grip on Commercial Space](#)
- [How To Measure The Brightness of Your Night Sky | AstroBackyard](#)



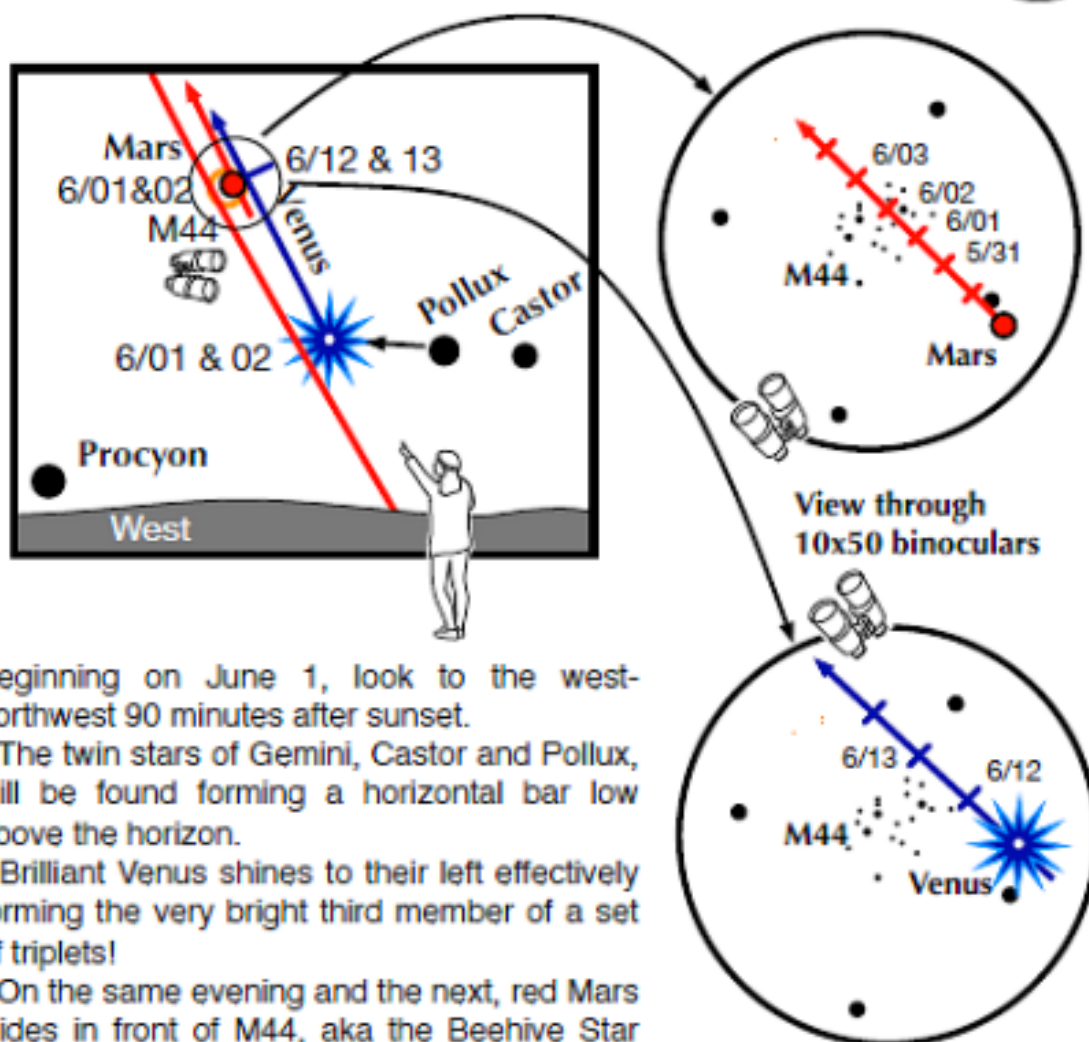
Skip Whitehurst - great tip about 12-volt Lithium Power packs for running you telescopes and lower prices than the traditional ones at astronomic sites. He recommends a 6000-milliamp hour or higher unit. He says the 11,000 model has an adapter that fits Meade Telescopes. [Amazon Page of selections](#)

New \$ 400 ZWO SEESTAR S50 automated imaging scope that pairs with your phone.
<https://astronomy-imaging-camera.com/product/zwo-seestar/>
Google for vendors and reviews *zwo seestar s50 smart telescope*





A must see celestial planetary play: Two planets visit the Beehive



Beginning on June 1, look to the west-northwest 90 minutes after sunset.

- The twin stars of Gemini, Castor and Pollux, will be found forming a horizontal bar low above the horizon.
- Brilliant Venus shines to their left effectively forming the very bright third member of a set of triplets!
- On the same evening and the next, red Mars slides in front of M44, aka the Beehive Star cluster, positioned above Venus. Use

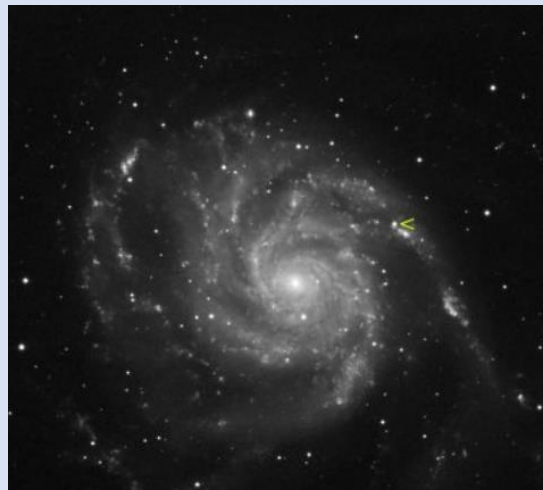
binoculars to find Mars sitting amid the many stellar bees.

- Ten nights later, it is Venus' turn to stay at the Beehive for two consecutive nights. The planet travels along the outskirts, farther from Beehive central than Mars moved. Again, bring out the binoculars. How does the glare of brilliant Venus affect the scene?

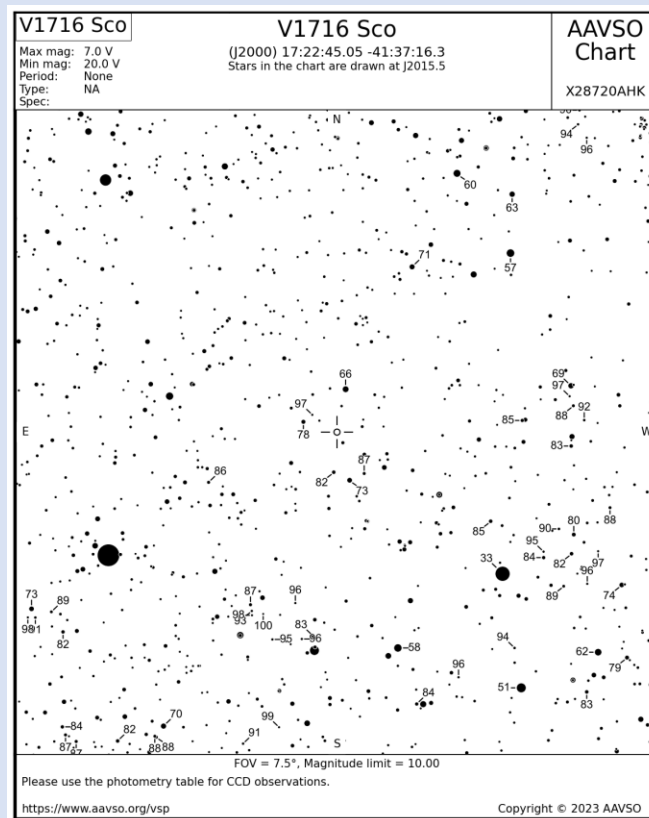


ODDS AND SODS

By Brad Young



[There is a new supernova, in Messier 101 near the Big Dipper.](#) Designated SN 2023ixf, it is 12th magnitude, but was still brightening a bit on May 21. It is the star at about 2:00 on the face of the spiral above, with a yellow arrow pointing to it. [More Image as information on M 101 Super Nova 2023ixf](#) [Astronomy Picture of the Day May 22](#) [SpaceWeather.com May 22](#) [More Observational Data](#)



[The nova in Scorpius discovered by my observing buddy in Australia is still 11th magnitude.](#) It's a bit low in the US, but worth a look. The star labeled 33 (mag 3.3) is eta Scorpio, along the low curve of the body of the Scorpion.

[The Spring Galaxy Challenge is still on at the Astronomical League \(click for the list\)](#). Some of the items are gone (wouldn't the satellite galaxies of M31 be autumn targets?) but you only must see 10 of the 20 to earn a certificate. [All the details are here](#).



Note the satellite behind the dome...

[My friend Kevin sent an article on Citizen Science](#) using the Catalina Sky Survey to search for dangerous asteroids. I don't know what I'd think if I found one, but I've been doing the same type of thing described in the article for years now via the PAN-STARRS survey, and we've found 3 new ones provisionally numbered. We also "beta tested" the CSS images and helped them get this going. It's not hard to do at all, and you might discover an asteroid!

Venus will appear to close in on Mars and have a great [appulse](#) around June 26 while both are near Regulus, the brightest star in Leo. But, before Venus appears to reach Mars, its forward motion first slows and then it begins to retrograde back towards the sun. From our vantage point, it never gets closer than 3 degrees (about 6 moon widths). All of this happened low in the west; look as soon as it gets dark or about 20-30 minutes after sunset.



[You may remember last August](#) when I announced the [heliacal rising](#) of Sirius, ending the Dog Days of Summer. Sometime around Memorial Day, you may see the heliacal setting of Sirius. Our Dog Days don't start until July 3 because Sirius, along with all other stars, has [precessed](#) in the centuries since the tradition was founded. Supposedly, summer is hot because the heat of the summer sun is augmented by the bright Sirius shing in the daytime sky.

JOHN LAND EARNS MENTOR AWARD

By Brad Young

At the MSRAL conference this month I will have the pleasure of presenting John Land with the [Astronomical League Mentor Award](#). John has worked tirelessly in our club for over 40 years, holding many different positions, taking on tasks like editor of the newsletter, and always attending to new members and those young in the hobby. Although this award is in recognition of his efforts with a specific person (me), I would bet that any number of the folks in the Astronomy Club of Tulsa could claim that John has been a mentor to them. Here are some stories that were shared with me for this article.

"I met John many years ago at Halley's comet viewing at Broken Arrow High School. My oldest daughter Tracy was taking his astronomy class. When my daughter came home and told me her teacher was setting up an outreach at the high school, I was as excited as a little kid. We walked around and met lots of folks and looked at the comet through various telescopes. John did an excellent job organizing and giving a presentation of the night sky. By the way I did get an "awful" picture of the comet. Still have it and still treasure it. Thank you, John.

Around 2006, I purchased my first telescope from a colleague at work. You all probably know him, Rod Gallagher. I went to several outreach programs. One was at Mohawk Park, a great opportunity and I visited again with John. I wondered if he remembered my daughter Tracy. Yes, he remembered her. That is a true educator, they remember and care for their students.

It takes true dedication and love of astronomy and fellow astronomers as John does to put in so much effort and time. John has always been there to help me with my journey as I have progressed through the years. He is a great educator and a good friend. Keep up the great work John." By Stan Davis

My own story is one of learning how to "deal" with the public. Never sanguine about outreach, I spent years barely speaking to other observers. But, with John as a good example, I slowly began to attend outreach activities and volunteering in club events.

I have been known to differ, ever so slightly, with John on a few things, but that just shows what a good mentor he is. Ever since I met him when I was about 12, while being dragged to the boonies (51st and Lewis) by my parents, he has been here for us. He is still active all these years later, leading the MSRAL Conference Committee despite many issues, he certainly has dedication. After all, this started out as the 2020 conference in Tulsa.

If you have a chance to, be sure and congratulate John on this award. He joins K.C. Lobrecht and Rod Gallagher as previous ACT winners of this award. As an educator himself, I would bet that John derives the most pleasure from knowing that his efforts have helped many Tulsans discover and improve their love of astronomy.

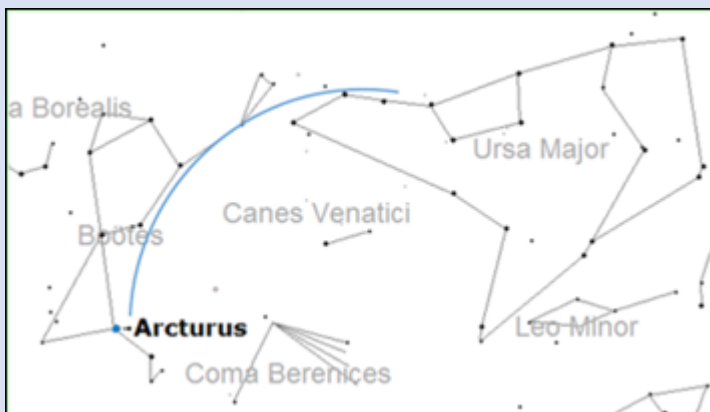
*John points his laser to the sky,
As gazers watch his monthly show,
He's never seen a star too high,
Or an electric bill too low*

*His patience honed from teaching school,
Adept at herding cats,
Pronouncing each star by the rule
From Algenib to Alpheratz*

*Thank you, John, for all the tours
Held there beneath the starry dome
The Mentor Award now is yours
And ACT your home*

Poem by Brad Young

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 Bootes, 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 weatherman 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 eleven.)

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 the 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 through 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.

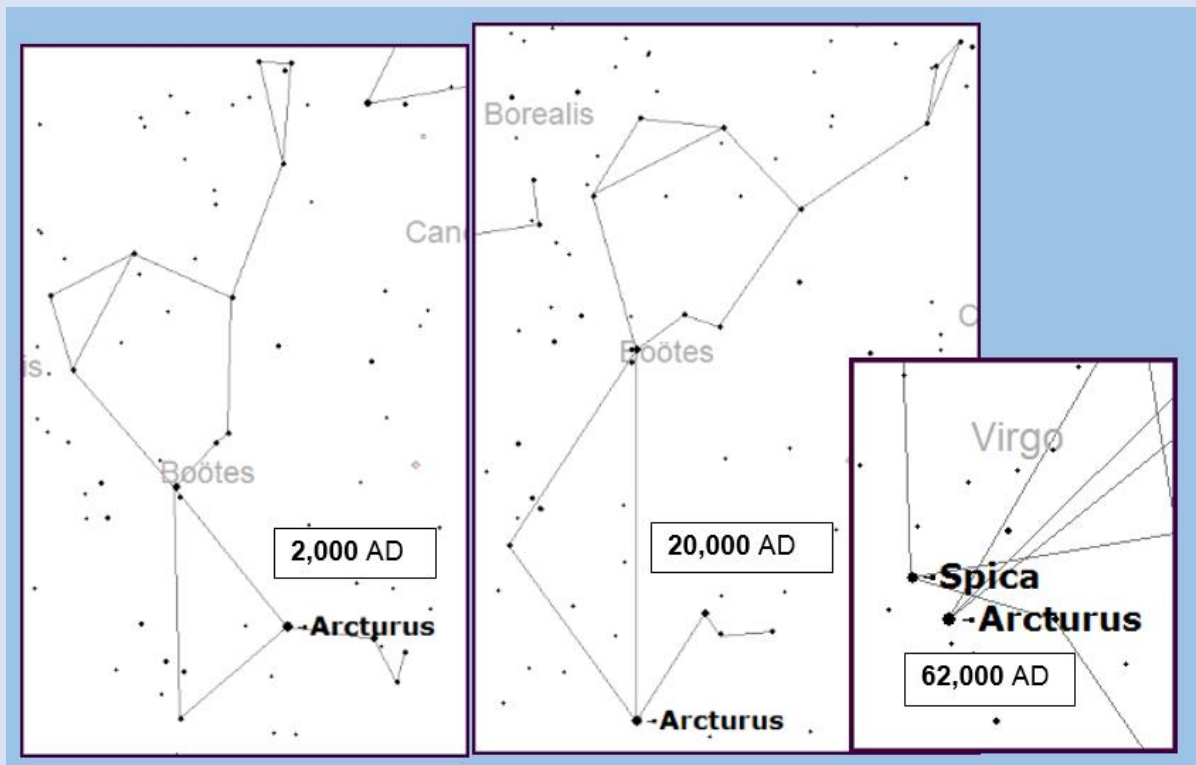
Details at [A WORLD'S FAIR MOMENT: THE STAR THAT CONNECTED 1893 AND 1933](#)

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 stellar 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. The stars changing positions relative to our point of view 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 level 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 the 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 microarc seconds. (A microarc seconds is 1 millionth of 1/3,600 of a degree)

Using this type 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/>
2014 Video - Arc to Arcturus https://www.youtube.com/watch?v=3_E-0sDp8hk
<https://www.star-facts.com/arcturus/> with some ads mixed in.

Time Travel through the Stars.

Since Edmund Halley's discovery in 1718 that the stars themselves change their positions over long periods of time. Scientist have developed instruments to make extremely accurate positions of the Proper Motions of stars.

This website simulator created by Tony Dunn allows you to watch the how proper motion changes the appearance of the stars in constellations over a 60,000-year period.

<http://orbitalimulator.com/constellations/constellationProperMotion.html>

Associate Treasurer Report

Mike Blaylock



As of May 25, we had 196 members 14 New members for 2023

We welcome this month's newest members – Shelly English, , Brad Gibson and Jim Danforth. Hello and welcome to ACT !

Have you changed you Contact Information? Email, Phone, Postal Address ?

Please help us to maintain our records by sending an email to AstroTulsa.Tres@gmail.com

Accounts as of May 25, 2023

Checking: \$ 4,062.00

Savings: \$ 2,790.90

Investments: \$ 30,818.00 (Value tends to fluctuate with markets).

You can JOIN or RENEW memberships or magazine subscriptions ONLINE using ANY MAJOR CREDIT CARD.

The transactions are processed through PayPal but you Do Not need a PayPal account.

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

Click Submit and you will be given the choice of either MAILING in your dues with a check or paying online with most major credit cards. A modest processing fee is added to online transactions.

Membership rates for 2023 are as follows:

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

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

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

**Additional Family membership: \$ 20 with voting rights and League membership.
\$ 15 with voting rights but without League Membership.**

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

Join Online – Add or renew magazine subscriptions. <https://www.astrotulsa.com/join>

MAGAZINE SUBSCRIPTION RATES and PROCESS has CHANGED !

You can get a discount rate as a Astronomy Club member. **However, you will need to do so directly using their discount rate web links.** Both Sky & Telescope and Astronomy have options for DIGITAL as well as PRINT subscriptions.

For club member's Discount subscription rates to [Sky and Telescope magazine](#) go to [this page](#)

For club member's Discount subscription rates to [Astronomy magazine](#) go to [this page](#)

Use the DISCOUNT RATE LINKS above instead of their regular subscription pages to MAKE or RENEW your subscription.



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!

Look Up in the Sky - It's a Bird

Theresa Summer

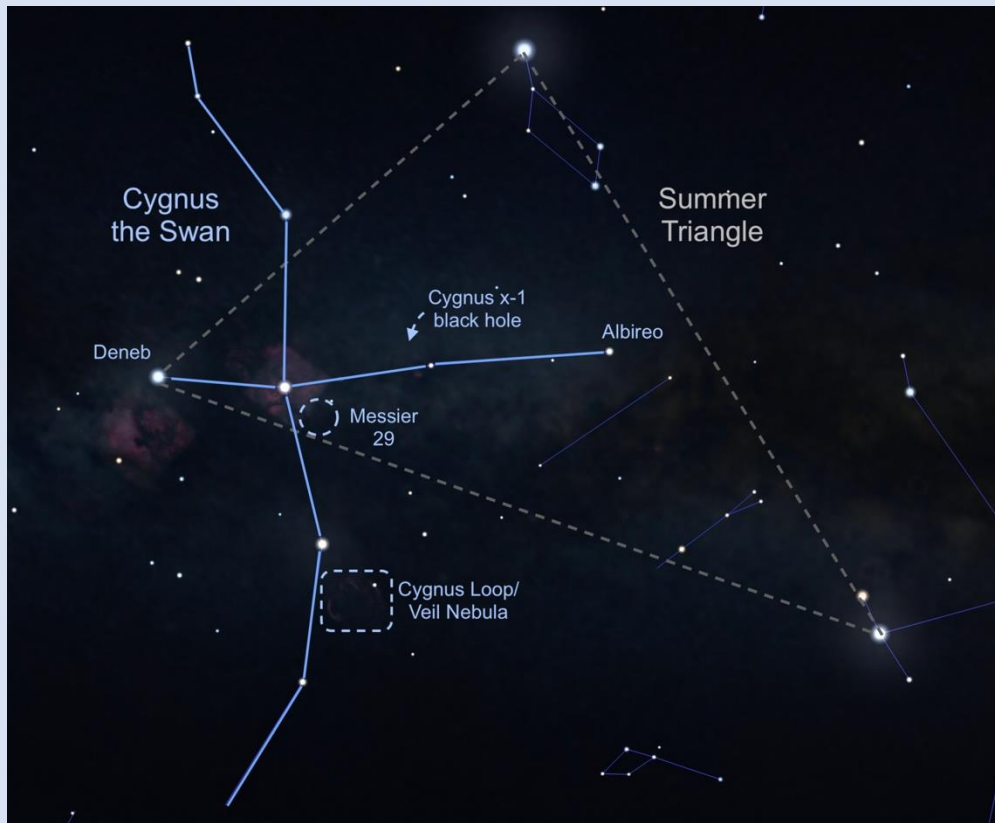
Bird constellations abound in the night sky, including Cygnus, the majestic swan. Easy to find with its dazzling stars, it is one of the few constellations that look like its namesake and it is full of treasures. Visible in the Northern Hemisphere all summer long, there's so much to see and even some things that can't be seen. To locate Cygnus, start with the brightest star, Deneb, also the northeastern most and dimmest star of the Summer Triangle. The Summer Triangle is made up of three bright stars from three different constellations – read more about it in the September 2022 issue of Night Sky Notes. "Deneb" is an Arabic word meaning the tail. Then travel into the triangle until you see the star Albireo, sometimes called the "beak star" in the center of the summer triangle. Stretching out perpendicular from this line are two stars that mark the crossbar, or the wings, and there are also faint stars that extend the swan's wings.

From light-polluted skies, you may only see the brightest stars, sometimes called the Northern Cross. In a darker sky, the line of stars marking the neck of the swan travels along the band of the Milky Way. A pair of binoculars will resolve many stars along that path, including a sparkling open cluster of stars designated Messier 29, found just south of the swan's torso star. This grouping of young stars may appear to have a reddish hue due to nearby excited gas.

Let's go deeper. While the bright beak star Albireo is easy to pick out, a telescope will let its true beauty shine! Like a jewel box in the sky, magnification shows a beautiful visual double star, with a vivid gold star and a brilliant blue star in the same field of view. There's another marvel to be seen with a telescope or strong binoculars – the Cygnus Loop. Sometimes known as the Veil Nebula, you can find this supernova remnant (the gassy leftovers blown off of a large dying star) directly above the final two stars of the swan's eastern wing. It will look like a faint ring of illuminated gas about three degrees across (six times the diameter of the Moon).

Speaking of long-dead stars, astronomers have detected a high-energy X-ray source in Cygnus that we can't see with our eyes or backyard telescopes, but that is detectable by NASA's Chandra X-ray Observatory. Discovered in 1971 during a rocket flight, Cygnus x-1 is the first X-ray source to be widely accepted as a black hole. This black hole is the final stage of a giant star's life, with a mass of about 20 Suns. Cygnus x-1 is spinning at a phenomenal rate – more than 800 times a second – while devouring a nearby star. Astronomically speaking, this black hole is in our neighborhood, 6,070 light years away. But it poses no threat to us, just offers a new way to study the universe.

Check out the beautiful bird in your sky this evening, and you will be delighted to add Cygnus to your go-to summer viewing list. Find out NASA's latest methods for studying black holes at www.nasa.gov/black-holes.



Look up after sunset during summer months to find Cygnus! Along the swan's neck find the band of our Milky Way Galaxy. Use a telescope to resolve the colorful stars of Albireo or search out the open cluster of stars in Messier 29. Image created with assistance from Stellarium: stellarium.org

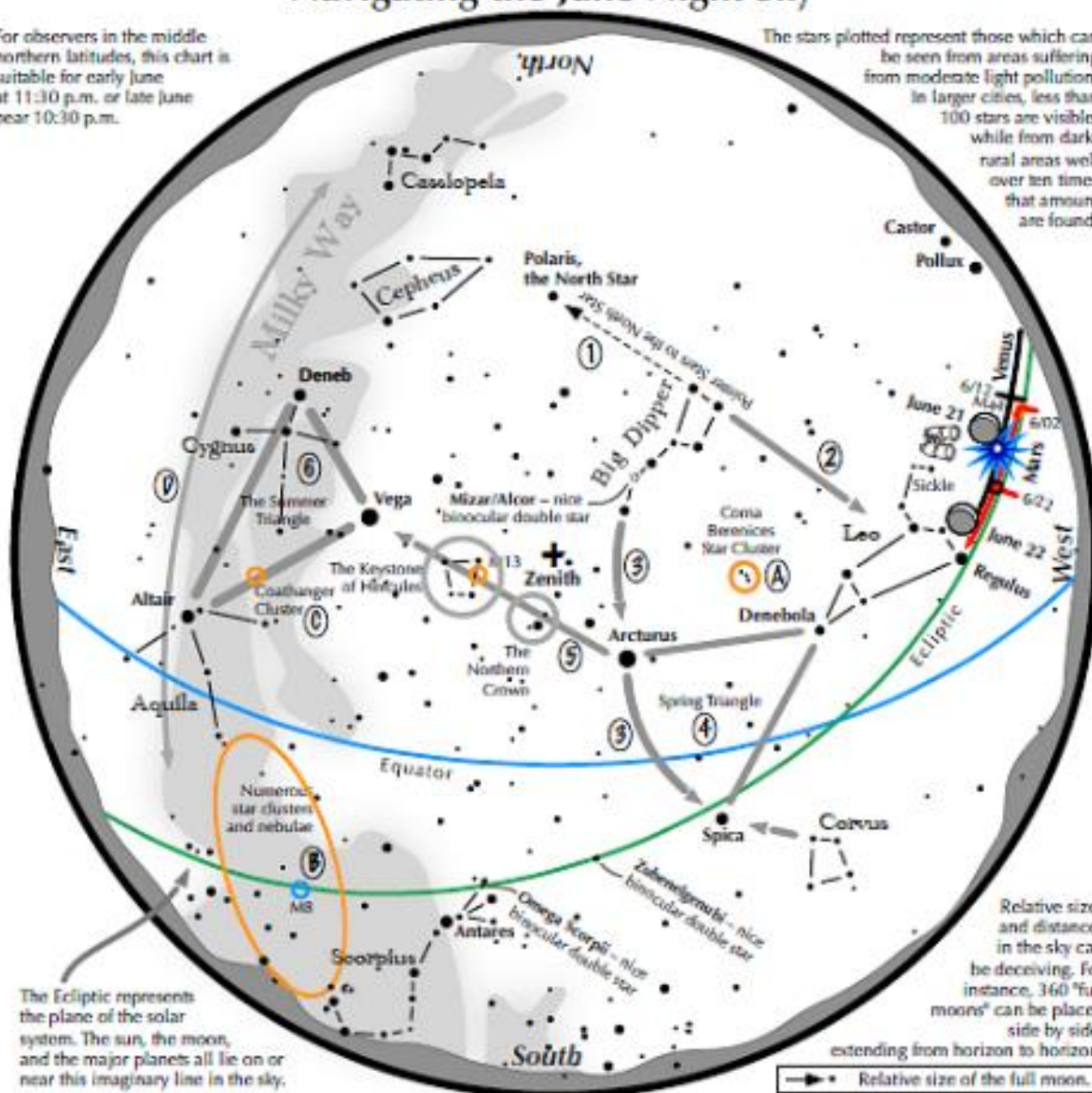


While the black hole Cygnus x-1 is invisible with even the most powerful Optical telescope, in X-ray, it shines brightly. On the left is the optical view of that region with the location of Cygnus x-1 shown in the red box as taken by the Digitized Sky Survey. On the right is an artist's conception of the black hole pulling material from its massive blue companion star. (Credit: NASA/CXC chandra.harvard.edu/photo/2011/cygx1/)

Navigating the June Night Sky

For observers in the middle northern latitudes, this chart is suitable for early June at 11:30 p.m. or late June near 10:30 p.m.

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

→● Relative size of the full moon.

Navigating the June night sky: Simply start with what you know or with what you can easily find.

- 1 Extend a line north from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
- 2 Draw another line in the opposite direction. It strikes the constellation Leo high in the west.
- 3 Follow the arc of the Dipper's handle. It first intersects Arcturus, the brightest star in the June evening sky, then Spica.
- 4 Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.
- 5 To the northeast of Arcturus shines another star of the same brightness, Vega. Draw a line from Arcturus to Vega. It first meets "The Northern Crown," then the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.
- 6 High in the east are the three bright stars of the Summer Triangle: Vega, Altair, and Deneb.

Binocular Highlights

- A: Between Denebola and the tip of the Big Dipper's handle, lie the stars of the Coma Berenices Star Cluster.
- B: Between the bright stars of Antares and Altair, hides an area containing many star clusters and nebulae.
- C: 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger.
- D. Sweep along the Milky Way for an astounding number of faint glows and dark bays.

Astronomical League www.astroleague.org/outreach; duplication is allowed and encouraged for all free distribution.



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**
105 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 Guest – both individuals and families as well as our regular members.

Several of our club members set up telescope for public

viewing.

* Groups need to make separate arrangements.

MEMBERS OBSERVING NIGHT usually on a Friday near new moon

Reserved for club members and their families to allow them to pursue observing projects.
The Observatory is **ONLY OPEN** for **SCHEDULED EVENTS**.

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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2023 [Go to Show Schedule](#)

Click the Date Column to sort them by show date

Most Shows take place on

Tuesday evenings from 7:00 PM to 8:00 PM
a few on Saturday

Do you have ideas for our club In Person or ZOOM Meetings?

Want to share an observing experience or astrophoto.
Know someone willing to be a Guest presenter?

We would also welcome YOU to do a short 5-10
minute section of interest or new equipment you'd
like to review.

Create a Cartoon on a Space Theme

Contact our Editor [John Land](#)

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