ASTRONOMY CLUB OF TULSA

OBSERVER

JULY 2020

Bringing Stars to the eyes of Tulsa since 1937

Editor – John Land

M 20 M 8 M 22

Deep Sky Treasure Hunting in the of Summer Sky

IC 1396 M 27 M 16

These image thumbnails from photographer Michail Blaylock are just a few of many sights awaiting you to discover them in the night sky.

In this Issue

Astronomy Club Events

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

All Public SUMMER Events are suspended til further notice

Plans may change based on how the current Health situation evolves.
Check our website www.AstroTulsa.com events section for updates

Members ONLY Events
with Social Distancing Guidelines in Effect

JULY: **Member Observing Night**
Friday, July 10, 8:30 PM
Saturday, July 11 8:30 PM (backup)

Friday, July 17, 8:30 PM
Saturday, July 18, 8:30 PM (backup)

August: **Member Observing Night**
Friday, Aug 14, 7:45 PM
Club Members Picnic
Saturday, Aug 15 Time to be announced

Member Observing Nights
Friday, Aug 21, 7:45 PM
Saturday, Aug 22, 7:45 PM (backup)

Check our website www.AstroTulsa.com events section for updates

Looking for Virtual Sky Events ! !

Try the Videos and Facebook Live sessions from Chabot Space & Science Center

https://www.facebook.com/pg/ChabotSpace/videos/?ref=page_internal

PRESIDENT'S MESSAGE

BY TAMARA GREEN

Hey Y'all!
This is going to be a short but sweet message. Due to the continuing COVID-19 crisis, we are still not going to plan any events for the public or guests. All of our events for July, and possibly for the remainder of the Summer and going into Fall, will be for members and immediate household only. Scheduled events for July are in another section of this newsletter.

I hope that all of you and your families are still staying safe and well.

I will be scheduling a board meeting via Zoom very soon to discuss the progress of the pandemic, plus any club issues, and we will continue to monitor this situation and let you all know what develops. It is my hope that we can start having regular public and group events after September, but I'm not holding my breath. We will just have to see how this plays out. Please be patient with us, come out and enjoy our members' nights, and stay well!

Clear Skies, Tamara Green

Guidelines for Members Only Observing Night

No guests – other than immediate family – no large family groups.
This will be a phased in effort in order to protect our members while also enjoying observing.
These are Guidelines for trial openings for May and June.

Members are asked to cooperate with the following policies.

1. **Observers are asked to stay in FAMILY UNITs - instead of mixing with other groups**
   (Family Units are persons living in same residential setting regardless of relationship)
   Kids should be 12 or older and stay with their family.
2. **Maintain SIX FOOT Social Distancing between observing groups.**
3. **Use your OWN OBSERVING EQUIPMENT – instead of sharing telescopes etc**
4. **MASKS are Optional but RECOMMENDED when in close proximity.**
   If you have a mask you may wear it if it makes you feel safer.
5. **OBSERVATORY CLASSROOM WILL BE CLOSED - Unless on way to the restroom**
6. **REST ROOM – use good hand washing and hygiene –**
   We will provide hand Sanitizer. -Clean up all surfaces as you leave the restroom area.
7. **OBSERVATORY DOME and TELESCOPE will be CLOSED.**

**** If you know you have been exposed to persons with Covid-19 or**
if you are showing symptoms of this or other illness
Please Stay Home until you are fully recovered and Fever and Symptom free.
If you have health issues that may put you at added risk, we recommend you stay home for now.
Keep in Mind these hopefully temporary measures as we move forward toward normalcy.

Okie-Tex Registrations due by AUGUST 22

Every fall nearly astronomy enthusiasts from all over the country and beyond gather under some of the darkest sky on the planet for a weeklong fest of starlight. Located at the tip of the Oklahoma Panhandle in the high dry Black Mesa near the tiny town of Kenton – **population 17** !

Okie-Tex Star Party Sept 1-19, 2020
NEW for 2020 – Okie-Tex will start on a FRIDAY and finish up on Saturday Morning.

Pre-registration must be postmarked by Saturday, August 22 may be mailed or Online.
Star Party Brochure

Every fall astronomy enthusiasts from all over the country and beyond gather under some of the darkest sky on the planet for a weeklong fest of starlight. Located at the tip of the Oklahoma Panhandle in the high dry Black Mesa near the tiny town of Kenton – **population 17** !

MEAL RESERVATIONS The nearest town, Boise City, is 35 miles away. **population 1,030** So "popping out" for a meal is prohibitive. **Excellent Meals are catered by Jody's Catering, of Boise City, OK. and must be prepaid by Aug 20**. There's also a midnight cash grill open until 2:00 AM. Read all the details at **http://www.okie-tex.com/index.php**

JULY Sky Show – Planets, Meteors and Comets

July Moon Phases	Full	3rd Quarter	New	1st Quarter
	Fri 4	Sun 12	Mon 20	Mon 28

Jupiter and Saturn reach oppositon. Look for the pair on bright planets rising in the SE soon after sunset. You'll need to wait until they are at least 15 degrees up to see good detail. For best viewing, observe over grassy areas instead of hot cement and let your telescope adjust to the outside temperatures.

The two gas giants reach opposition within 6 days of each other. **Jupiter on July 14 and Saturn on July 20.** At oppostion the Earth passes directly between the Sun and an outer planet. The Earth is then closest to the planet for that year resulting it appearing brightest and largest in a telescope. Also the planet rises near sunset and is up until it sets near dawn. **2020 marks the coming Grand Conjunction** of Jupiter and Saturn as the planets will pass a mere 4 arc mins (1/15 deg) apart on the evening of Dec 21st. Such grand conjunctions occur at 20 year intervals. The last was in May 2000 but too close to the sun to observe.

Jupiter's Four large moons are fun to watch even in small telescopes. You can see their shifting positions from night to night. Witness their eclispes as they go into or out of the planet's shadow. Or even look for their own tiny shadows crossing the planet. Catching Jupiter's Great Red Spot crossing the planet is a rare treat. (Currently it appears a a small brownish oval) Various Astronomy Apps will show you the arrangement of the moons.

I like the **Jupitermoon** app from Sky &Telescope which gives you predictions of events for the evening. Saturn's rings a currently tilted 22 degrees putting on a good show. Its large moon Titan is visible in the smallest scopes and large scopes will show 4 to 6 moons. There is also a **Saturnmoon** app available. You can also find their information at online sites.

Mars rises about 1:00 AM in early July and midnight by August. It is already about -0.7 mag by July 1 and will continue to brighten util its oppostion Oct 13th. The **Mars 2020 mission** to land the Perserverance rover on Mars is scheduled to launch July 22nd for its touch down in Jezero crater on Mars on 18 February 2021

Venus has moved to the Morning Sky rising in the ENE before dawn. Gleaming at -4.5 mag it is even visible in the brighten dawn. Venus will reach is greatest elongation from the Sun in early August rising 3.5 hrs before the sun. **Mercury** will make a brief low appearance in the dawn sky in late July. **Neptune and Uranus** can be found in the post midnight sky. They reach oppositions Sept 11 and Oct 31 respectively.

Bartlesville Teen begins Weekly Video Series for Astronomy Magazine
Astronomy magazine is excited to introduce a new weekly video series that will let you explore the cosmos from the comfort of your own home. Hosted by **Abigail Bollenbach** — an ambitious and enthusiastic astronomer in the making — ***Infinity and Beyond*** will introduce you to some of the most fascinating aspects of our solar system, galaxy, and universe! The first edition aired June 18 You can see it at ***Infinity And Beyond: The Big Bang***

Images from a Ship Far Far Away

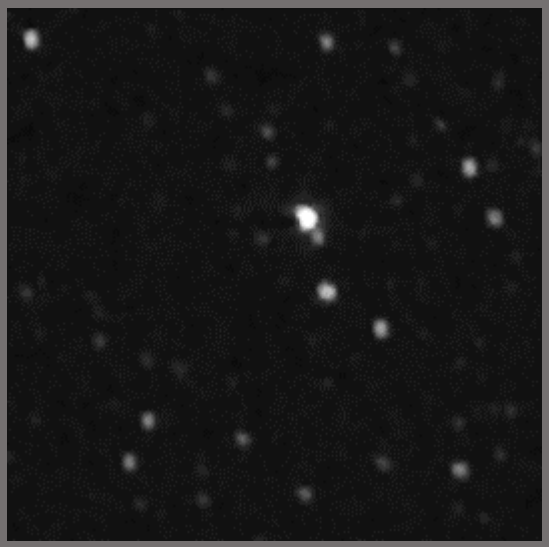
The **New Horizons** spacecraft was launched on it mission toward Pluto on Jan. 19, 2009. After a 9.5 year journey it flyby Pluto on July 14, 2015 returning amazing images of a small but dynamically active planet. Images showed a large sea of nitrogen ices surrounded towering peaks of rock and ice. It also revealed a multi-layer atmosphere. As the hardy spacecraft continued on its outward journey from the sun it flew by one of the thousands of tiny primitive member building blocks of the solar system. On Jan 1, 2019 it took close up images of Ultima Thule (now officially named ***Arrokoth***) revealing a double lobed body formed by the merger of two smaller planetesimals. Now more than 14 years and 5 months into its mission it is again returning unprecedented images far beyond Earth.

Taking images from 4.3 Billion miles away, the New Horizons images clearly show a shift in position of the nearby star Proxima Centauri ~ 4.25 Light years away. This shift in position is known as parallax. **Parallax** is the observed apparent change in the position of an object resulting from a change in the position of the observer. Parallax occurs when a closer object appears to shift position against a more distant background when the object is observed from different positions. This is easily demonstrated by holding a pencil at arm's length in front of you and then blinking your view from one eye to another. The same occurs when nearby stars are observed from opposite sides of Earth's orbit.

Parallax views from New Horizons. **See Full article**

Click to see an short animation video of the parallax shift

Earth View



New Horizons from 4.3 billion miles away – 6.5 Light hours

Comet NEOWISE has been rapidly brightening since entering the SOHO solar satellite's coronagraph's field of view on June 23rd It's jumped from magnitude +4.0 to +2.9.
If this trend continues, Comet NEOWISE will be easy to see with the unaided eye when it emerges from the sun's glare in mid-July. First, though, it has to survive the sun.

See Finder Chart etc at **Comet NEOWISE C/2020 F3**

Comet NEOWISE reaches perihelion (closest approach to the sun) near the orbit of Mercury on July 3rd. SOHO will be able to follow the comet to the doorstep of that encounter. If NEOWISE it is still intact on June 28th when it leaves the coronagraph's field of view, there's a good chance it will "go the distance" and become a summer comet of first magnitude. **Stay tuned!** If the it survives its brush with the sun we may be seeing a naked eye comet passing through the passing through the southern portions of Ursa Major begin as early as July 17. Watch **https://spaceweather.com/** for updates.

4000 Comet Discoveries and counting !

On June 15, 2020, a citizen scientist spotted a never-before-seen comet in data from the **So**lar and **H**eliospheric **O**bservatory, or SOHO — the 4,000th comet discovery in the spacecraft's 25-year history. The SOHO solar satellite records continuous observations of the Sun from it orbit around the Earth's L1 Lagrange point 1 million miles closer to the sun. Its primary mission is to record the Sun's activity but it images also show objects such as comets that venture into it field of view. Over the years ordinary citizens have access to the images and have trolled old images looking for comets that pass near the sun. **Read the Whole article**

Print your own
Astronomy Posters or Trading Cards

NASA Solar System Exploartion Page offers numerous choices of stunning images with information backings that you can print at home.

Check them out HERE

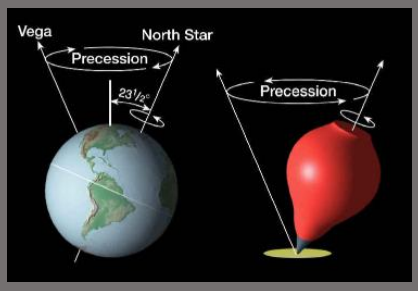
Interesting points about our Summer Solstice: *By John Newton*

This year on June 20th marks the Summer Solstice, what is typically known as the longest day of the year. But did you know our planet experiences two Summer Solstice each year? The first one is in June for the Northern Hemisphere while the second is in December for the Southern Hemisphere – both occur in Summer for its respective places in the world. However, with respect to the northern half we think of it as Summer (June) and Winter (December) Solstices. For the Northern Hemisphere the December Solstice is best known as the shortest day of the year.

Even though most people consider June 21 as the date of the June Solstice, it can happen anytime between June 20th, as in this year, and June 22nd. Solstice events on June 22nd are very rare indeed as the last one took place in 1975 and there won't be another one until 2203

The word Solstice comes from the Latin word *'sol'*, meaning Sun and *'sistere'*, meaning to come to a stop or stand still. On the day of the June Solstice, the Sun reaches its northern most position relative to Earth called the Tropic of Cancer. The Tropic of Cancer is positioned approximately 23°27′ N of the terrestrial equator. This latitude corresponds to the northern most declination of the Sun's ecliptic (an imaginary line in the sky that marks the annual path of the sun), to the celestial equator where the sun does not move any further north or south as during most other days of the year but stands still at the Tropic of Cancer. It then reverses its direction and starts moving south again.

At present time during the Summer Solstice the Sun appears in the constellation Gemini, but much earlier in history it was in the constellation Cancer, hence the term 'Tropic of Cancer'. Because of the gradual change in the direction of Earth's axis of rotation, the Sun will reappear in the constellation Cancer in approximately 26,000 years.



This slow change in the direction that Earth's axis points in space is caused by **Precession** of Earth's axis. Imagine the spinning of a toy top. As it spins the it wobbles on its axis. Gravitational forces of the Sun and moon on the Earth equatorial bulge causes it to trace out a slow arc in the sky. Currently its North axis points near the star Polaris. In approximately 13,000 years it will point near the direction of the bright star Vega as our north star.

The opposite happens during the December Solstice when the Sun reaches its southern most position in the sky, or 'Tropic of Capricorn'. Again, at the moment of the December Solstice the sun appears to stand still, and then reverses its direction towards the north again. The June Solstice occur at the exact same instance in time all over the world. In 2020, this happened on June 20 at 21:43 UTC. – (4:43 PM CDT)

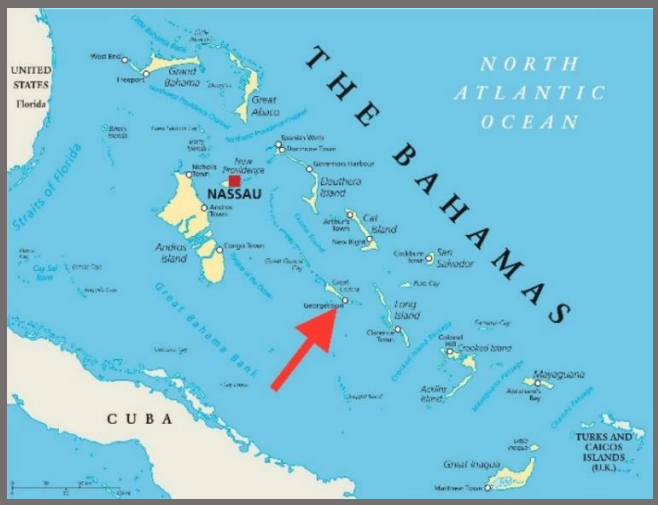
One might think that since it is summer in the Northern Hemisphere, the Earth is closest to the Sun during the June Solstice, but it's the opposite. The Earth is actually at its farthest from the Sun during this time of the year. In fact, the Earth will be on at aphelion on July 4th at 11:35 UTC, (6:35 AM CDT) at a distance of 94,507,635 miles just two weeks after the June solstice. The Earth's distance from the Sun has very little effect over the seasons on Earth. Instead, it the tilt of Earth's rotational axis, which is angled at around 23.4 degrees thereby creating seasons.

The direction of Earth's tilt does not change as the Earth orbits the Sun - the two hemispheres point towards the same direction in space at all times. What changes as the Earth orbits around the Sun is the angle of the hemispheres in relation to the Sun - the Northern Hemisphere tilts towards the Sun during the June solstice, thus experiencing summer, while the Southern Hemisphere tilts away from the Sun and therefore experiencing winter during this time.

Even though the June solstice is the longest day of the year in the Northern Hemisphere, most places do not see the earliest sunrise of the year on this day. The earliest sunrise happens a few days before, and the latest sunset takes place a few days after, the June solstice. Due to the tilt of the Earth, the June Solstice is the only day of the year when all locations inside the Arctic Circle experience a continuous period of daylight for 24 hours. Midnight Sun in Alaska Due to atmospheric refraction, however, the midnight sun is visible for a few days before and on the June Solstice from areas as far as 60 miles south of the Arctic Circle. As one moves further north of the Arctic Circle, the number of days with the Midnight Sun increase. The opposite is true for the Antarctic. Just as with the Northern Hemisphere, any location south of the Antarctic Circle has Polar Night several days before the June solstice.

Enjoy the brightness of summer while it lasts.

Tropic of Cancer mark at Little Exuma, Bahamas.



Fun with Lists

By Brad Young

I did get to do some observing during these last few months, working on a list of Herschel items. Those are much fainter than the Messiers, and I was scraping the bottom of the barrel at the end of one program designed for seeing them.

The program[1] is at https://www.astroleague.org/content/astronomical-league-herschel-society
As with many lists, it is ordered by Right Ascension, west to east. This makes sense because things travel across the sky that way, and everyone can locate them from any point on the planet. But, it does tend to cause one issue in planning your observing sessions.

As you work down the list, you find your target is (NGC 8888)[2] near the Big Dipper. The next one is NGC 8889, located in Crater at -29 deg.

Wait, what? In the constellation Crater? What's a Crater, I though they were on the moon?

And, since that constellation is so far south, it's already set, and you can't see it again for 6 months.
I wondered what the worst case of this was. Most of my observing lately has been up in Ursa Major, and since there is a huge number of galaxies in Virgo, it seemed like that jump of around 50 degrees north to south must be the worst. I modified the spreadsheet[3] provided with the program to calculate the distance in degrees from sequential NGC items in the list, filtered it down to sequential pairs (e.g. NGC 1, NGC 2) and found out the worst "jump" is actually:

Object	R.A.	Declination	Constellation
NGC 1343	03:38	+72.6	Cassiopeia
NGC 1344	03:28	-31.1	Fornax

That's a whopping 103 degrees – more than half the whole sky! This part of the sky is seen best in late fall / winter, and a great example of how you can get in trouble. Cassiopeia is visible almost all year, as it is so far north. Fornax can be seen only a few months in the cold dreary winter. Just something to consider when planning your observing.

Notes:

1. If you want to know the story of this program, just ask me about it.
   Allow 2 hours; bring ear protection and your favorite adult beverage
2. Fake NGC numbers and positions, used for examples
3. If trying item #1 wasn't fun enough, ask me my opinion of that spreadsheet

If you want to learn more about catalogs, this is a pretty good article:
https://astronomy.com/magazine/2018/08/an-ngc-primer

TREASURER'S and MEMBERSHIP Report

BY JOHN NEWTON

As June 22, 2020, the Astronomy Club of Tulsa has **158 members** This month was the fastest growing month of the year so far. We welcome our newest members starting this month including **James Russell**, **Steven Sierra**, **Christian Garland**, **Johannes Ornelas**, **Manuel Contreras**, **Jefferson Davis**, **Judy McNeer**, **Donovan Riley** and **David Down.** Hello and welcome to ACT! In addition, we have a long-term member returning to the club. Welcome back **Tony Blakesley**. We look forward to seeing you all at our meetings and at club events throughout the year.

Accounts as of June 22, 2020
Checking: $ 7,568.61
Savings: $ 6,784.05
Investments: $ 24,255,81 (Value tends to fluctuate with markets).

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

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

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

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

Membership rates for **2020** are as follows:
Adults: $ 45 per year, includes Astronomical League Membership.
Sr. Adult: $ 35 per year for those 65 or older, includes Astro League Membership.
Students: $ 30 with League membership; Students: $ 25 without League membership.
Additional Family membership: $ 20 with voting rights and League membership.
$ 15 with voting rights but without League Membership.
The regular membership allows all members in the family to participate in club events but only ONE Voting Membership and one Astronomical League membership.

Join Online – Add or renew magazine subscriptions.
http://www.astrotulsa.com/page.aspx?pageid=16

Magazine Subscriptions: If your magazines are coming up for renewal, try to save the mailing label or renewal form you get in the mail. Forms are available on the club website.
Astronomy is $ 34 for 1 year, or $ 60 for 2 years. **www.astronomy.com**
To get the club discount you must go through the club group rate.
Sky & Telescope is $ 33 per year **https://skyandtelescope.org/**
Sky & Telescope also offers a 10% discount on their products.
You may renew Sky & Telescope subscriptions directly by calling their number -**be sure to ask for the club rate.**

You are invited to come join us to learn more about
Astronomy and view the wonderful sights in the night sky.
Check our Events Page of Dates **Link to Events Page**

During the school year our club holds a
Monthly General Club meetings at
Jenks Public Schools Planetarium
105 East B St, Jenks, OK
Located North of the intersection of
1st and B St
Meetings begin at 7:00 PM

Take the elevator to the 3rd floor.
Click for Google Map Link

2020 See the **Fall Planetarium Show Schedule**
Then click the Date Column to sort them by show date

Sidewalk Astronomy Night

East side of Bass Pro in Broken Arrow near the lake.
101 Bass Pro Drive, Broken Arrow, OK
Click Map Link here
SIDEWALK ASTRONOMY is SUSPENDED due to pandemic
On a Saturday evening near the 1st Quarter moon Astronomy Club volunteers set up telescopes to share views of the moon, planets and other bright objects. It's a come and go event where shoppers and restaurant goers get a chance to experience glimpses of the universe with their own eyes.

ASTRONOMY CLUB OBSERVATORY
Located on a hilltop about 25 miles SW of Tulsa
Features: classroom, restroom, dome with 14-inch telescope and an acre to set up your telescopes.

Weather permitting, we host two types of observing nights.

PUBLIC OBSERVING NIGHT on a Saturday
SUSPENDED due to pandemic
This event is open to individuals and families.
Club members set up telescope for public viewing.
***** Groups need to make separate arrangements.

MEMBERS OBSERVING NIGHT usually on a Friday near new moon
Reserved for club members and their families to allow them to pursue observing projects.

The Observatory is ONLY OPEN for SCHEDULED EVENTS. **Link to Events Page**
Click for Observatory Map
CAUTION: **DO NOT use GPS** it will likely send you on some nearly impassible back roads.

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NIGHT SKY NETWORK – Open Position

WEBMASTER JENNIFER JONES

Found this old cartoon clipping cleaning out some old boxes.

Classic Frank & Ernest

Tired of Jokes ReRUNS
Create a Cartoon or Funny line with an Astronomy theme and Send in your Best Ones !