

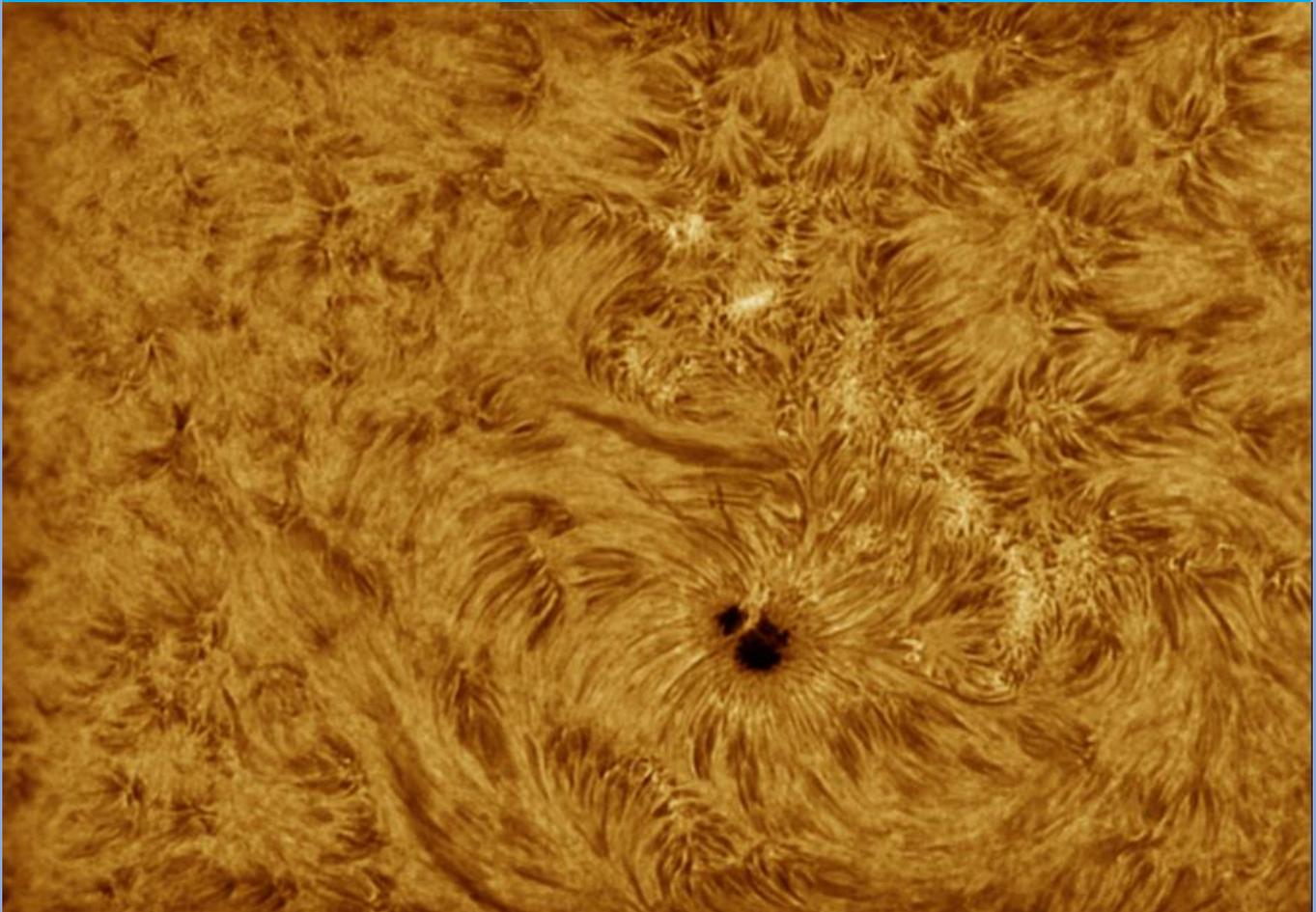


# OBSERVER

JUNE 2019

*Bringing Stars to the eyes of Tulsa since 1937*

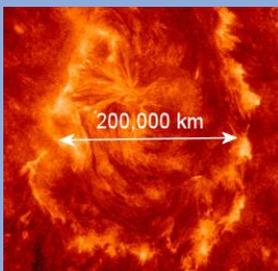
*Editor – John Land*



## Sunspot 2741 May 13, 2019

Image by John Moore using his Stellarvue SV102 ED refractor

With a Daystar Quark Chromosphere Ha solar filter and a ZWO ASI224MM Camera



Sunspot 2741 was a very active region producing at least four CME's ( Coronal Mass Ejections ) and impressive prominences when it reached the Sun's Limb May 18

The May 12 ejection that was 200,000 Km across ( 15.7 Earth's wide )

See more at [Spaceweather.com](http://Spaceweather.com) **May 13**

And at [Spaceweather.com](http://Spaceweather.com) **May 18**



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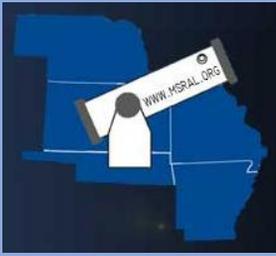
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We are trying something new this summer. If an Observing Night scheduled for FRIDAY night has to be Cancelled due to weather, we will try again on Saturday if the weather improves. CHECK the Astrotulsa.com Website on Saturday afternoon to see if the observing grounds will be open.

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

<b>JUNE</b>	<b>Moon</b>	<b>DATE</b>	<b>TIME</b>	<b>LOCATION</b>
MEMBERS' NIGHT	New	FRI, MAY 31	8:30 PM	OBSERVATORY
MEMBERS' BACKUP NIGHT	New	SAT, JUN 1	8:30 PM	OBSERVATORY
SIDEWALK ASTRONOMY	1ST Q	SAT, JUN 8	7:30 PM	BASS PRO
<b>SUMMER SOLSTICE</b>		<b>FRI, JUN 21</b>		
PUBLIC NIGHT	3rd Q	FRI, JUN 21	8:15 PM	OBSERVATORY
MEMBERS' NIGHT	New	FRI, JUN 28	8:45 PM	OBSERVATORY
MEMBERS' BACKUP NIGHT	New	SAT, JUN 29	8:45 PM	OBSERVATORY
<b>JULY</b>				
SIDEWALK ASTRONOMY	1ST Q	SAT, JUL 6	7:45 PM	BASS PRO
PUBLIC NIGHT	3rd Q	FRI, JUL 26	8:00 PM	OBSERVATORY
<b>AUGUST</b>				
MEMBERS' NIGHT	New	FRI, AUG 2	8:30 PM	OBSERVATORY
<b>CLUB PICNIC (MEMBERS ONLY)</b>		<b>SAT, AUG 3</b>	<b>5:00 PM</b>	<b>OBSERVATORY</b>
SIDEWALK ASTRONOMY	1ST Q	SAT, AUG 10	7:30 PM	BASS PRO
PUBLIC NIGHT	3rd Q	FRI, AUG 23	7:30 PM	OBSERVATORY
MEMBERS' NIGHT	New	FRI, AUG 30	8:00 PM	OBSERVATORY
MEMBERS' BACKUP NIGH	New	SAT, AUG 31	8:00 PM	OBSERVATORY

**MEMBER’S FACEBOOK FORUM** - Come join us on our private Facebook group. Just search for the group "Astronomy Club of Tulsa Members Only" and click join. You will be granted access once you have been verified as a club member. This an informal group to announce things privately to only club members. Everyone please feel free to post request for astronomy help, meet ups at the observatory, post for sale astronomy gear, or general club chatter. It is a moderated group, please keep it civil. Hopefully this can become better method for everyone to keep each other in the loop.



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

Our Tulsa Club is hoping to host one of the MSRAL conventions soon, so plan to attend this one to see what all the fun is about.

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

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

Featuring tours of the Kennedy Space Center and a Southern Skies Cruise to the Bahamas

Weather permitting sections of the deck lights will be

turn off to enjoy dark Atlantic skies. Special reserved rates for the cruise are going fast **so make your reservations ASAP**

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

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

## *Jenks Planetarium Celebrates Apollo 11 Moon Landing*



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

### **APOLLO 11 50<sup>TH</sup> ANNIVERSARY EVENT--JULY 20 *New!***

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

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

**JENKS PLANETARIUM**  
**205 East B Street, Jenks**

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

Purchase online at  
[jenkscommunityed.com](http://jenkscommunityed.com)  
 or call 918-298-0340

**For a complete listing of the shows for June and July**  
**Plus the special week of shows on the Apollo 11 Landing.**

[Go to Show Schedule](#) Click the Date Column to sort them by show date

**Full listing of Summer Programs on page 3 of our May newsletter**  
[http://astrotulsa.com/CMS\\_Files/05-2019.pdf](http://astrotulsa.com/CMS_Files/05-2019.pdf)

## *Treasurer's Letter to our club members:* John Newton



Having lived long enough there are only a handful of global events that truly stand out that I can still remember exactly where I was and what I was doing when those moments took place. For instance, memories are still vivid when I hear historic occasions like September 11, Mt. St. Helen's, the Challenger Disaster, and when Man First Walked on the Moon.



It's almost hard to believe but this year marks the 50th Anniversary of the Apollo 11 Moon Mission. Having witnessed this first hand, it's remarkable to think that this country would set an almost unattainable goal years prior where three men, accepting of this challenge, would venture out on the faith of the technology of the day allowing them to meet this goal of landing, walking on the moon, and return them safely home.

When trying to compare the power of the Apollo Guidance Computer to that of an iPhone or Android, you would be right in thinking that there is no comparison. Today, the entire set of code from the moon mission could be placed into an app on your phone.

In actuality, the Apollo mission used four computers to achieve this mission, but it's hard to overlook how impressive they really were. For starters, they were designed and developed by MIT's Instrumentation Laboratory and were thought to be at least 10 years ahead of their time. Also, unlike computers or phones today, they did not crash! They worked continuously even when they went into overload at the time of the landing itself.

Although an iPhone or Android beats the Apollo's guidance computers in absolute power several thousand times over, there's still that chance of a freezing. Granted, the computing systems and code that NASA uses today to power them with the next milestone of landing on the moon is fully loaded with contingency code streams to handle virtually any situation, you must admire the leap of faith and bravery these men must have taken back in 1969.

**The Club invites you to SHARE YOUR MEMORIES of Apollo 11** – For our July Newsletter I would like to include a section of our members memories of the moon landing. Write a paragraph or two about you're your experience and feelings at this momentous event. Send them to Subject: **Memories of Apollo 11 to [Tulsaastrobiz@gmail.com](mailto:Tulsaastrobiz@gmail.com)** – include your name and an email address. If you can send them as an attached word document but email will also work. Please **send them by June 24** to include in the July issue.

## *NASA Wants Your Apollo Moon Landing Memories*

<https://www.space.com/nasa-wants-apollo-moon-landing-memories.html>

Many of us old enough to have witnessed the Apollo 11 landing have vivid memories of where we were on that historic night. "NASA wants the public's help to create an oral history of the 50th anniversary of the first moon landing.

Apollo 11's lunar module touched down safely on the moon on July 20, 1969, carrying astronauts Neil Armstrong and Buzz Aldrin. With the big anniversary coming up soon, NASA's Explorers: Apollo program will release a commemorative audio series that includes stories submitted by the general public, sharing their views on space exploration and the Apollo moon landings.

All recordings should be submitted to [apollostories@mail.nasa.gov](mailto:apollostories@mail.nasa.gov). **Recordings received before June 14 will have the best chance of getting featured in the series**, NASA said. The ultimate deadline for submissions is Dec. 31. NASA has released detailed recording instructions in a statement."

# PRESIDENT'S MESSAGE

BY TAMARA GREEN



I hope all of you and your families have stayed safe during the severe weather and flooding around the state. Taking Owen to and from work, it has been really unnerving and outright scary to see all the flooded areas in between our home and his work that look like lakes now! Plus, having to take alternate routes due to some of the roads along our usual route being flooded have been really upsetting! I hope all of you are able to get to where y'all need to go and back again!

I hope you all had a wonderful Memorial Day Weekend! Mine is going to be spent doing work around my house. It needs it though.

Summer is just around the corner! With that in mind, we, as a board, have decided to try an experimental schedule for the months of June, July, and August pertaining to Public Nights. The Public Night will be moved to Fridays, with Saturdays as the back-up nights if weather allows.

Friday, June 21 at 8:15 PM, with Saturday, June 22 as the back-up;  
Friday, July 26 at 8:00 PM, with Saturday, July 27 as the back-up;  
Friday, August 23 at 7:30 PM, with Saturday, August 24 as the back-up.

In September, the Public Night schedule will return to our normal Saturdays. (Please note that September 21 is the first day of Okie-Tex, so we will seriously need volunteers who will not be going to that to help at the observatory on that night! Let me know closer to that date if you can volunteer. Owen and I plan to be at Okie-Tex, so we will not be available.)

Also, our friends at TASM have expressed interest in doing quarterly star parties with us. At the time of this writing, I am working on a plan for one to be held on Friday, July 5. I have not yet heard back from them, but I will let all of you know soon. We will keep our regular Sidewalk Astronomy at Bass Pro on Saturday, July 6.

We are also working on plans for our annual Club picnic for Saturday, August 3 at the Observatory. This was discussed at a previous board meeting. As soon as we get all the final details worked out, I will send an announcement soon.



Don't forget to register for Okie-Tex if you are planning to go! It is going to be September 21 thru 29 this year. Pre-registration must be postmarked by no later than Saturday, August 31, 2019, and must be paid in full. Online registrations must be completed and paid in full by Midnight CDT on Sunday, September 1, 2019. Meals will again be catered by Jody's Catering, Boise City, OK. Meal registrations and payments must be received postmarked by no later than September 1, 2019. <http://www.okie-tex.com/index.php>

Also, the Astronomy Club of Tulsa and Broken Arrow Sidewalk Astronomers are working on plans to collaborate to host the MidStates 2020 convention! We will need volunteers to help with that too! We have already a Chairman and Vice Chairman, and a Food Coordinator, but we will need people to help procure vendors, speakers, etc. More details about who will be needed for what function will be coming soon. Peggy Walker is going to submit our bid to MSRAL by the end of May.

I hope that many of our members will come out and participate in our fun Summer events. It will be a blast!

*Clear Skies, Tamara Green*



## *Four Planets return to the Evening Skies*

For most of the winter months, planet viewing has been a predawn endeavor. Mars was the lone straggler in evening sky but shining near its minimum at +1.6 mag and appearing as a tiny disk less than 5" wide. The summer months promise to be prime time for evening planets!

Bright **Jupiter reaches opposition on June 10** rising in the SE at sunset. It will be visible all night. As we draw near the Summer Solstice June 21<sup>st</sup> it doesn't get dark until after 9:15 PM So plan to do your observing later in the evening. Jupiter's four large moons can be seen in small telescopes and even detectible in binoculars. For the best viewing be sure to give your scope about a half hour to adjust to the outdoor temperatures. Avoid observing over warm concrete or looking over roof tops. <http://stargazersonline.org/episodes/1921.html>

In the late 70's as Voyager was on its way to Jupiter the amateur astronomy community was asked to carefully time eclipses of Jupiter's moons as they entered or emerged from its shadow and send in our data. These were used to help refine their orbits prior to Voyager's arrival. While these events are no longer needed for scientific purposes its still an enjoyable challenge. Even a small scope at 80 to 100X can let you observe a shadow transit or eclipse event. Here is a link to a detailed PDF of [2019 Phenomena of Jupiter's Moons](#)



Recently observers have report changes in Jupiter's cloud patterns. The May Sky & Telescope reports that the Equatorial Cloud bands are experiencing a darkening due to seasonal changes in the overlying clouds. Most interesting of all is that the Great Red Spot is experiencing a disturbance causing it to "leak" material into the adjoining cloud bands. See more of the story at

[Great Red Spot Unfurls](#) The GRS can be seen for a couple of hours before or after it transits Jupiter's meridian. Don't expect a "cherry" red oval. Its color is more a muted reddish brown. A light green or blue filter can help provide more contrast. Here is a link to a [GRS calculator](#) Times are given in UT. Our Tulsa CDT is 5 hours earlier. Thus 22 UT is 17 CDT. Also has info on a great phone App for Jupiter phenomena. ( Doesn't work yet on iPhone X )

**Saturn rises in the SE about Two Hours after Jupiter.** It rises about 10:30 in early June but by July it will rise in the evening twilight. Saturn reaches opposition on July 8<sup>th</sup>. For good views of Saturn's rings your scope needs to at equilibrium with the outdoor temperature. You'll also need to wait for it to get 20 degrees or more above the horizon. Saturn takes 29.5 years to orbit the sun and Jupiter takes 11.8 years. So about every 20 years they come to a "Grand Conjunction" These two gas giants will have a very close conjunction near the winter solstice of 2020 – so keep an eye on them as they draw nearer over the next 18 months.

**Mars** has a close conjunction with elusive **Mercury** near the western horizon in the evening twilight June 17 and 18. See the details in the Night Sky Network article on page [7](#)



This article is distributed by NASA Night Sky Network

June 2019

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit [nightsky.jpl.nasa.org](https://nightsky.jpl.nasa.org) to find local clubs, events, and more!

### Jupiter Shines in June

David Prosper

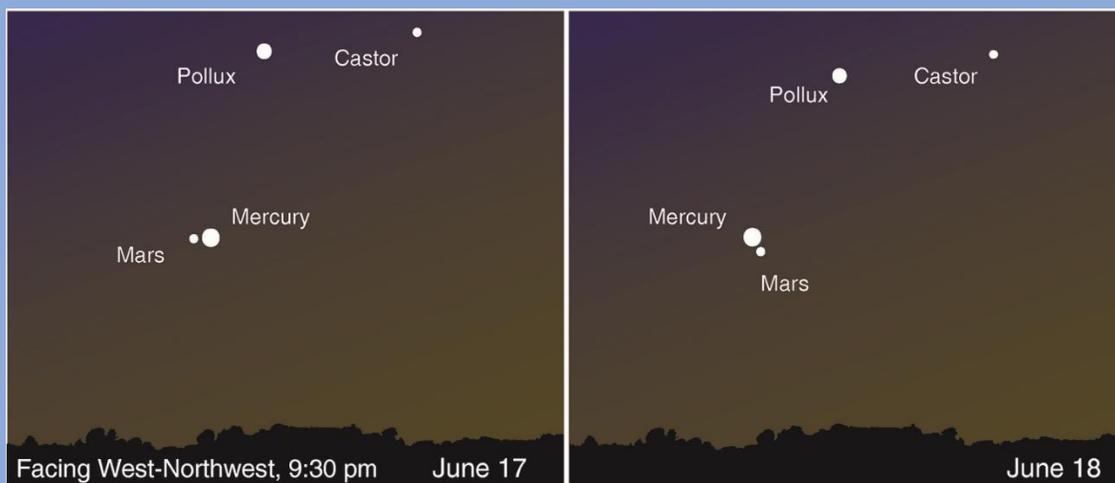
**Jupiter** stakes its claim as the king of the planets in June, shining bright all night. **Saturn** trails behind Jupiter, and the **Moon** passes by both planets mid-month. **Mercury** puts on its best evening appearance in 2019 late in the month, outshining nearby **Mars** at sunset.

Jupiter is visible almost the entire evening this month. Earth will be between Jupiter and the Sun on June 10, meaning Jupiter is at **opposition**. On that date, Jupiter rises in the east as the Sun sets in the west, remaining visible the entire night. Jupiter will be one of the brightest objects in the night sky, shining at magnitude -2.6. Its four largest moons and cloud bands are easily spotted with even a small telescope.

What if your sky is cloudy or you don't have a telescope? See far more of Jupiter than we can observe from Earth with NASA's **Juno** mission! Juno has been orbiting Jupiter since 2016, swooping mere thousands of miles above its cloud tops in its extremely elliptical polar orbits, which take the probe over 5 million miles away at its furthest point! These extreme orbits minimize Juno's exposure to Jupiter's powerful radiation as it studies the gas giant's internal structure, especially its intense magnetic fields. Juno's hardy JunoCam instrument takes incredible photos of Jupiter's raging storms during its flybys. All of the images are available to the public, and citizen scientists are doing amazing things with them. You can too! Find out more at [bit.ly/JunoCam](https://bit.ly/JunoCam)

**Saturn** rises about two hours after Jupiter and is visible before midnight. The ringed planet rises earlier each evening as its own opposition approaches in July. The **Moon** appears near both gas giants mid-month. The Moon's tour begins on June 16 as it approaches Jupiter, and its visit ends on June 19 after swinging past Saturn.

**Mercury** is back in evening skies and will be highest after sunset on June 23, just two days after the summer solstice! Spot it low in the western horizon, close to the much dimmer and redder **Mars**. This is your best chance this year to spot Mercury in the evening, and nearly your last chance to see Mars, too! The two smallest planets of our solar system pass close to each other the evenings of June 17-18, coming within just  $\frac{1}{4}$  degree, or half the width of a full Moon, making for a potentially great landscape photo at twilight.



Mars & Mercury after sunset on June 17-18, 2019

Image created with assistance from [Stellarium](https://www.stellarium.org/)

Discover more about NASA's current and future missions at [nasa.gov](https://nasa.gov)



See current high-resolution images of Jupiter by famed astrophotographer Christopher Go at <http://astro.christone.net/jupiter/index.htm>

This image from May 17, 2019 shows the GRS and a shadow transit from its moon Europa



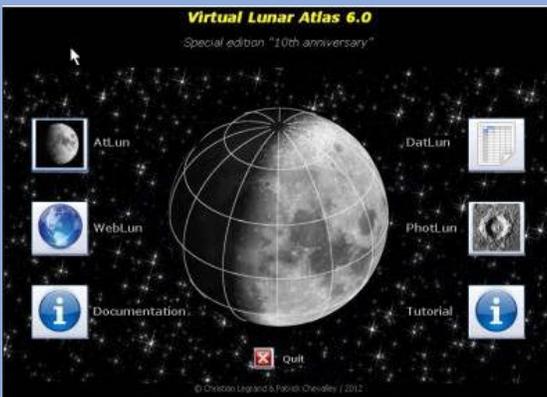
Have you seen the **Moon's Golden Handle** ?

Peter Lowenstein caught it on Wednesday morning, May 15th, as the Moon was setting over Mutare, Zimbabwe: His image appeared on [Spaceweather.com](http://Spaceweather.com) **May 16**

"The Golden Handle appears once a month when the sun rises over the Moon's Bay of Rainbows (Sinus Iridum). Sunbeams cutting almost horizontally across the bay's hardened lava plains clip the top of the surrounding Jura Mountains (Montes Jura) forming a golden-crested "handle."

Did you miss the handle? It'll be back next month before the full Moon of June. On your calendar **circle June 12, 2019** and label it "Golden Handle."

Sky and Telescope is offering a Free Download a high-quality map of the Moon! See their website <https://www.skyandtelescope.com/>



The **Free Virtual Moon Atlas** has been updated for newer Windows versions

Plus many additional features and data sets from the older versions

Check out its features to see if it works for you <http://ap-i.net/avl/en/start>

# TREASURER'S and MEMBERSHIP Report

BY JOHN NEWTON



As of May 23rd, the Astronomy Club of Tulsa has **163 members**. We welcome our new members starting month – **Michael Tobler, Artie Bible, Aldofo Sanchez and Jan Sartor**. Hello and welcome to ACT! We look forward in seeing you at our meetings and other club gatherings. **Thank You!** goes out to our long-term members for their continued support.

## Accounts as of May 23, 2019 -

**Checking: \$ 7,575.41**

**Savings: \$ 5,781.15**

**Investments: \$ 23,746.06** (Value tend to fluctuate with market changes).

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

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

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

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

Membership rates for **2018** are as follows:

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

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

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

**Additional Family membership: \$ 20 with voting rights and League membership.**

**\$ 15 with voting rights but without League Membership.**

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

**Join Online** – Add or renew magazine subscriptions.

<http://www.astrotulsa.com/page.aspx?pageid=16>

**Magazine Subscriptions:** If your magazines are coming up for renewal, try to save the mailing label or renewal form you get in the mail. Forms are available on the club website.

**Astronomy** is \$ 34 for 1 year, or \$ 60 for 2 years. [www.astronomy.com](http://www.astronomy.com)

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

**Sky & Telescope** is \$ 33 per year [www.skyandtelescope.com](http://www.skyandtelescope.com)

Sky & Telescope also offers a 10% discount on their products.

**Note:** You may renew your Sky & Telescope subscription directly by calling the number on the renewal form, **be sure to ask for the club rate.**

NEW SUBSCRIPTIONS must still be sent to the club

Dates and Times for Events are found at [www.AstroTulsa.com](http://www.AstroTulsa.com) under EVENTS tab  
Be sure to check the Website for Weather Cancellations before coming.

You are invited to come join us to learn more about  
Astronomy and view the wonderful sights in the night sky.

Check our Events Page of Dates [Link to Events Page](#)



During the school year our club holds a  
**Monthly General Club meetings** at  
**Jenks Public Schools Planetarium**  
205 East B St, Jenks, OK  
Located North of the intersection of  
1st and B St

**Meetings begin at 7:00 PM**

When you enter the building lobby,  
take the elevator to the 3<sup>rd</sup> floor.

[Click for Google Map Link](#)



**Sidewalk Astronomy Night**

East side of Bass Pro in Broken Arrow near the lake.  
101 Bass Pro Drive, Broken Arrow, OK

[Click Map Link here](#)

On a Saturday evening near the 1<sup>st</sup> Quarter moon Astronomy Club volunteers set up telescopes to share views of the moon, planets and other bright objects. It's a come and go event where shoppers and restaurant goers get a chance to experience glimpses of the universe with their own eyes.



**ASTRONOMY CLUB OBSERVATORY**

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

Weather permitting, we host two types of observing nights.

**PUBLIC OBSERVING NIGHT** on a Saturday

This event is open to individuals and families.  
Club members set up telescope for public viewing.

\* Groups need to make separate arrangements.

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

The Observatory is ONLY OPEN for SCHEDULED EVENTS. [Link to Events Page](#)

[Click for Observatory Map](#)

CAUTION: **DO NOT** use GPS it will likely send you on some nearly impassible back roads.

## ASTRONOMY CLUB OFFICERS:

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NIGHT SKY NETWORK –  
Open Position

WEBMASTER JENNIFER JONES

## MEMBER ARTICLES WANTED

### PLANNING A FUN ASTRONOMICAL ADVENTURE?

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

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

Want to share your latest astrophotography success

Contact our Newsletter Editor about details at  
[Tulsaastrobiz@gmail.com](mailto:Tulsaastrobiz@gmail.com)

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

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