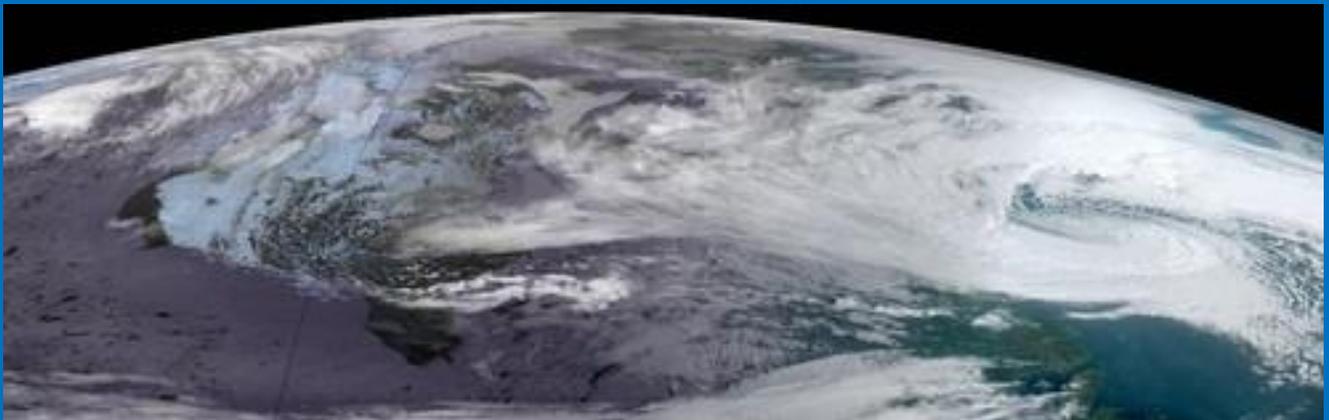
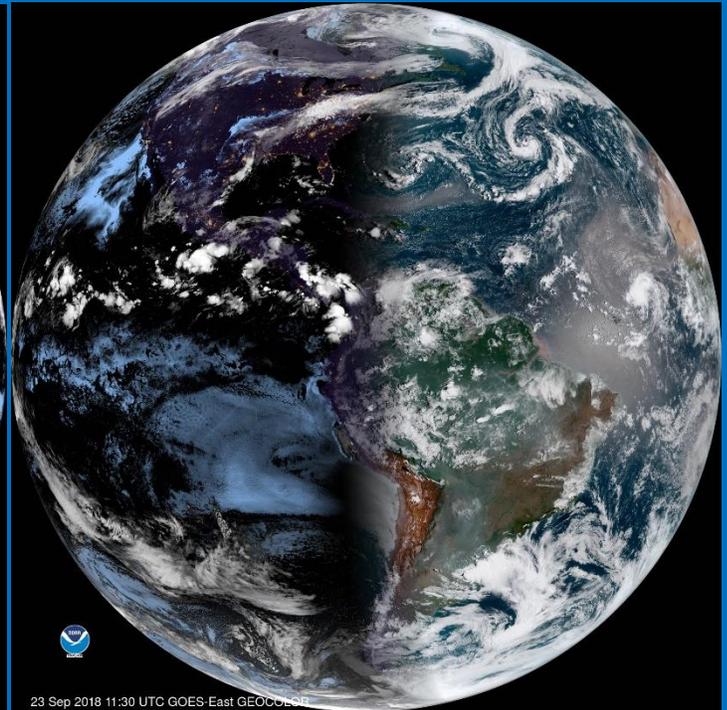
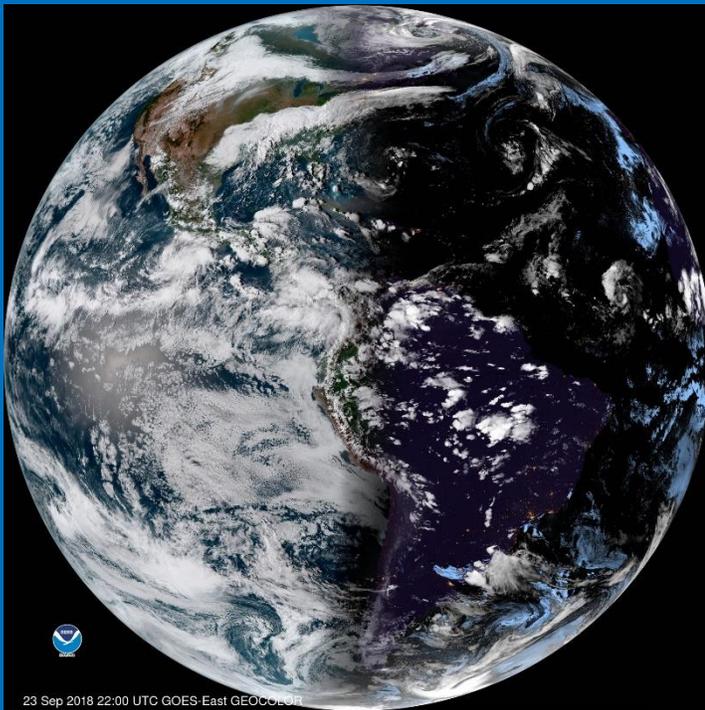




# OBSERVER

OCTOBER 2018

*Bringing Stars to the eyes of Tulsa since 1937*



## Earth at Autumn Equinox Sept 23, 2018

Notice that the Terminator line separating the Day and Night regions bisects the Earth into equal halves. Unlike the Moon the terminator is not a distinct line due to the Earth's atmosphere. If you examine the N Polar region enlargement you can see that the shaded area extends well past half-way. Because the sun neither is on the horizon all 24 hrs long neither setting or rising.

Image from [GOES-East Full Disk View - GeoColor](#) weather satellite

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## Astronomy Club Events

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

OCTOBER			
MEMBERS' NIGHT	FRI OCT 5	7:00 PM	ACT OBSERVATORY
<b>OKIE-TEX STAR PARTY 2018</b>	<b>OCT 6-14</b>	Western OK Panhandle	
<b>GENERAL MEETING &amp; ELECTIONS</b>	<b>FRI OCT 19</b>	<b>7:00 PM</b>	<b>JENKS PLANETARIUM</b>
SIDEWALK ASTRONOMY	SAT OCT 20	5:45 PM	BASS PRO
NOVEMBER			
<b>ANNUAL DINNER MEETING</b>	<b>SAT NOV 10</b>	<b>5:30 PM</b>	<b>JENKS PLANETARIUM</b>
PUBLIC NIGHT	SAT NOV 3	6:00 PM	ACT OBSERVATORY
<b>DAYLIGHT SAVING TIME ENDS SUNDAY, NOVEMBER 4.</b>			
MEMBERS' NIGHT	FRI NOV 9	5:30 PM	ACT OBSERVATORY
SIDEWALK ASTRONOMY	SAT NOV 17	4:15 PM	BASS PRO
<b>THANKSGIVING DAY</b>	<b>THU NOV 22</b>		

## Candidates for Club Officers and Board – Elections are Oct 19



We need our members to attend so that we have a Quorum to make the vote official.

**Our club cannot exist without member participation & volunteers.**

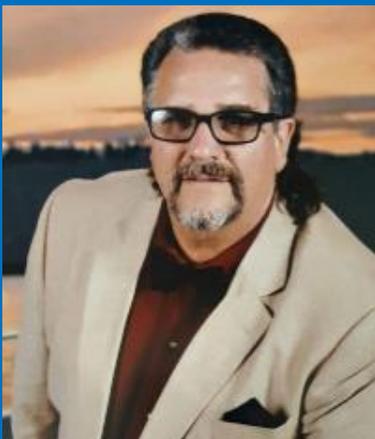
As an added incentive we will begin selling raffle tickets at the meeting to win a nice grab and go telescope. Drawing will be at the Annual Club dinner Nov. 10<sup>th</sup>.



**Tamara Green - President** We first met Tamara and husband Owen at our Aug 2003 Mars Opposition watch held near at Mohawk park. They joined the club in May 2004 and have been active ever since. Tamara has been President this past year. She has also served as Secretary from 2010 – 2014; President from 2007-2008; and as Board-Member-At-Large from 2005-late 2006. Has served two terms as Vice President and president part of 2006. As well as several years as Newsletter Editor (and Observing Co-Chair with husband Owen Green. They also host our SideWalk Astronomy nights.

**Her Likes are:** Cats, astronomy, beading and other crafting and artsy-fartsy things, collecting fountain pens, authentic Mexican food, sushi,

wine, cocktails, coffee and Owen. Not necessarily in that order. Hopes to see the club continue to do some neat things in the coming year!



**Jerry Cassity – Vice President**

My first experience with the Astronomy Club of Tulsa, was attending a Public Night at the Observatory where club members showed me the rings of Saturn, Several Nebulas, and other deep sky objects. Before I left that night, I knew I wanted to become a member and obtain a telescope. A few months later, I had my scope. I've been an active member ever since attending Member's Nights, Public Nights and Special Events. I served for a year on the Board of Directors and a year as Vice President. It's been a pleasure being a part of ACT and I look forward to the continued advancement of our club. I particularly enjoy the Public Events and love hearing the exclamations from those seeing celestial objects through a telescope for the first time. I understand the value our club has to its members and to the general public.

### **The Office of Club Treasurer is still open at the time of this publication.**

Tim Davis has served the club well in that office for the past Five Years and desires to step down from that position once a qualified, dedicated candidate steps forward.



**James Taggart – Board and Observatory manager**

James has been a tremendous addition to our club. He lives just a few miles from the observatory site which greatly adds to the security of the facility. In 2014 James took over as Observatory manager and has done a fantastic job maintaining the grounds and facility. During this time he negotiated the contracts for the new observatory roof, has installed an Internet WiFi system for the observing grounds and is currently working on a new wireless security system. 2018 started out with a major project to locate and repair a plumbing leak under the observatory slab. James and others spent many hours of hard labor in January saving the club a great deal of money in plumber fees.

He also directed the completion of the skirting on the observatory dome and repainting and sealing the floor and steps. James works as a technology architect for IBM designing and testing new systems. For 2019 he is exploring

ways to make the club's website more modern for mobile devices.



## < Tony & Jess > Cagnolatti

We are pleased to welcome two new young candidates eager to help with the club board this year.

**Jess has agreed to become the club SECRETARY  
Tony is running as a candidate for board.**

Since joining the club they have become regular volunteers at SideWalk Astronomy, Public Nights and other club outreach events.



While we weren't able to travel to a site in the path of totality, Jess and I enjoyed watching the partial solar eclipse together last year. Jess mentioned that she had always wanted to be an astronomer when she was growing up, and one of the items she wanted to get from her childhood home was the telescope her father had given her. I was fascinated by all the amateur astronomers with their telescopes while watching the live coverage of the eclipse, and it got me wondering if there was a club in Tulsa. After a quick Google search I found the Astronomy Club of Tulsa. With our 5th anniversary soon approaching, I thought it would be an awesome gift to join the club, and I was right. We finally found a hobby that we enjoy doing together, and over the last year have enjoyed attending every club event we could. It's amazing that just a year ago we knew next to nothing about telescopes or the stars and now we can set up and align our telescope and find several Messier objects in one night. We are truly grateful for the friendships we have made in the club and for the lifelong adventure of learning about the sky together. We want to share our experience with as many other people as possible.



**John Newton – Board** John has served the club faithfully as secretary for the past two years. He is passing the office on to others this year but will continue serving on the board. In addition to his wise counsel on the board he has pitched in to contribute many hours to the repairs at the observatory yearly this year.

He enjoys volunteering his time, energy and support to the club whenever possible.

A little about me. While in college I studied business and engineering. To date, my professional background includes over 30 years in the telecommunications industry. I started out in voice and data transmission services over copper facilities. As the communications technologies evolved I now apply my technical knowledge of laser light transmissions over a fiber optic medium for telecom providers globally.

Also in my college years, I took both solar and stellar astronomy classes which unlocked my interest in astronomy. The club and its members have been a remarkable resource for expanding my knowledge on astronomy while having access to a variety of optical instruments to help me in my curiosity of the heavens.



**Skip Whitehurst - Board** Skip was been a lifelong astronomy enthusiast. His father taught astronomy and Skip began studying the stars with his 6 inch refractor as a teen. He became a physicist and has worked in the both the geophysics and aerospace industries. He was a member of the Tulsa club in the early 90's and rejoined in 2011. Skip joined the board in 2014 and has volunteered with public nights, Sidewalk Astronomy nights and working on the maintenance of the observatory. His knowledge of electronics, computers and engineering details are a great asset to our club.



### **Jacob Shepherd –Board**

We are pleased to have had Jacob on the board this past year. Younger minds bring enthusiasm and fresh perspectives to the future of our club. Jacob says he has had an interest in astronomy since he was a kid. That sense of wonderment was rekindled in 2011 with a visit to the Hawaiian Observatories on the 14,000 ft high mountain of Mauna Kea. There he toured the Keck and Gemini telescopes. That night he got to stargaze under the amazing dark skies at the 9,200 ft altitude visitor center on the mountain. Living in Washington State, Jacob tells of driving up into the ski areas during the summer time and observing the Milky Way.

Living in Jenks now, Jacob is a Data Analyst and working on an advance degree at OSU. Jacob joined the Tulsa club in 2015. He enjoys helping on Public Nights using the 12” Meade Light Bridge telescope at the observatory to show our guest the wonderful sights of the night sky.



### **John Land – Board**

Having grown up along with the Space Age in the 50’s and 60’s, I have always been fascinated with space. I was blessed to have a mother with a keen scientific mind who encouraged my curiosity about the many wonders of God’s creations. I discovered the Tulsa Club in the spring of 1977 and used to drive 70 miles from Okemah to attend their meetings. I had some great mentors such as Nick Pottorf, who took the time to guide me on my journey of knowledge to discover the treasures of the night sky. One of my greatest joys as a member of the club is to pass that legacy on to others.

I accepted a science teaching position in the rapidly growing community of Broken Arrow in 1978. Following the Solar Eclipse of Feb 26, 1979, I was asked to start an Astronomy class that fall. For 28 years I was blessed to be able to share my passion for the wonders of God’s universe with several thousand students as well as my fellow teachers. I have served in various leadership capacities in the club including observing chair, president, treasurer, board member and presently as newsletter editor.



### **Richard Brady – Board**

Richard has been a member of the club since 2012. He has been a regular volunteer at public nights, Sidewalk Astronomy nights and other club events. He also assists with running the Dome Telescope on Public Nights. He has served on the board, as vice president and president for past 3 years. Under Richard’s leadership the club put a new roof on the observatory, repainted the classroom and made improvements on the dome. He has worked with Dan Zielinski from the Jenks planetarium to create a greater involvement with the club.



### **Sheldon Padawer – Board**

Sheldon rejoined the astronomy club in 2017. Since then he has volunteered at a number of public outreach events. Sheldon serves by presenting programs using the dome telescope for groups on our public observing nights. Sheldon began serving on the board in 2018. He has used his considerable craftsmanship skills to building shelving and add lighting to the observatory classroom. He has also shared ideas about how to make the classroom and observatory more attractive to guests and useable for public presentations.

# PRESIDENT'S MESSAGE

BY TAMARA GREEN



Hey Y'all!

We have some really fun fall events coming up, that I hope you will participate in!

The first one coming up is High Frontier, the rocket launch/star party in Pawhuska at the airport. That will be on Saturday, Sep. 29 and Sunday, Sep. 30. On Saturday, Sep. 29, starting at 9 AM, the Tulsa Rocketry Club will do rocket launches throughout the day, and some of us will have solar telescopes for solar viewing, then after the launches end at 5 PM, and after we eat dinner at Bad Brad's BBQ, we will go back to the airport and do a star party. There will only be rocket launches on Sunday, and when they are finished with the final launches, or until 5 PM, whichever comes first, the event ends.

More at <http://tulsarocketry.org/high-frontier/>

Next is **OKIE-TEX!!! Okie-Tex is from Saturday, Oct. 6 through Sunday, Oct. 14.** Okie-Tex is an annual week-long star party held at the tip of the Oklahoma panhandle. Advanced registrations closed Sept 15. If you have not registered, you can still attend, but it will be a lot pricier at the door. I believe it's \$120 at the door, plus the \$5 per person per day facility fee. Meal reservations were also due Sept 15 but if you are camping you may bring your own food. The nearest town is 35 miles away. I do not remember right off-hand how Jody handles at-the-door meals, but they are also a lot more expensive than they are at pre-registration, and there is no guarantee that there will be food available, after those who have registered have eaten. Sack lunches will be available, and of course, the Cosmic Café opens at 10:00 PM and closes at 2:00 AM. You can explore details and see whose coming at

<http://www.okie-tex.com/>

**Please make it a point to attend our October General Meeting on Friday, Oct. 19 at the Jenks Planetarium, beginning at 7:00 PM. This meeting will be the elections of our club officers and board for next year. We must have a quorum of at least 20 paid members in order to have the vote.**

**Sidewalk Astronomy is Saturday, Oct. 20 at Bass Pro** starting at 5:45 PM.

We are looking into the possibility of holding a Sidewalk event at the Gathering Place in the future.

**The Annual Dinner Meeting is Saturday, Nov. 10, at the big meeting room down the hall from the planetarium at Jenks. It will start at 5:30 PM.** The dinner is for club members and their families or guests. The price will be \$ 12 per person. Details will be sent out later about how to RSVP for the dinner.

A couple weeks ago, I sent out a poll to you all asking what you would like for us to have catered in. So far, **Italian is winning** with Mexican coming in at a close second. We are looking into which restaurant will best for catering. Details will be announced later.

That's all I have for now. Hope to see you at these upcoming events!

*Clear Skies,*

*Tamara Green*

# Catching a Rocket Venting Fuel over Australia

## The Parker Solar Probe

by Brad Young

On August 12, 2018 what will become the fastest manmade object ever was launched. It is the **Parker Solar Probe, a mission to explore the sun as closely as we have ever attempted.** With a heat shield attached, this probe will use Venus to gravity assist it into an “Icarus” orbit, within just 3.83 million miles (6.16 million kilometers) of the sun's surface. To get this close (but no closer!), **it must speed along at 430,000 mph (690,000 km/h)** during the nearest point to the surface, which is a balmy 5800°K. This mission should improve our knowledge of the most important star, at least to us.

The launch of this mission was available on NASA TV via the Internet, and I was able to watch it. As always, I would prefer to see rocket launches in person but I'm afraid Tulsa is quite far from the normal sites! After watching the launch, I decided to use some preliminary predictions that had been prepared on the Jet Propulsion Lab's website to try to image it on the way out, as I won't see it again anytime soon. Based on the time of launch and the planned first few orbits, the 3rd stage of the rocket was expected to separate from the probe and both, still close to each other, would pass over Australia in darkness. As luck would have it, the path of visibility included a remote telescope imaging site that I use frequently. This site, operated by **ITelesopes**, is located near Coonabarabran, New South Wales. I was lucky enough to visit the area three times to attend the OzSky Star Party. That area is quite a paradise for an amateur astronomer to visit (refer to my article in the 2009 newsletter for more information).

I started imaging using a wide field setup based on the predictions and noticed from the previews there was a glow visible at the edge of the frames. Changing the predicted path just slightly, I was able to get some images of the spent third stage rocket venting excess fuel while the probe continued on in orbit. This was quite a surprise! I had hoped to get a faint trail of the rocket, at best a tiny blob of the probe, but instead was treated to a spectacle. The best of the images are reproduced below.

This was quite a lucky stroke, I have been trying to catch a rocket fuel vent dump for several launches now, and finally got one. Using remote imaging expands our possibilities, not only for deep sky objects that we can't see due to weather or geography, but also for those once in a blue moon events.

I often use remote imaging to track satellites; I am by no means an avid imager – there are plenty of other people in our club it will be more useful – but the good thing is you can use it for whatever you like.

If you would like more information about the Parker Solar Probe please see the following:

<https://www.nasa.gov/content/goddard/parker-solar-probe>

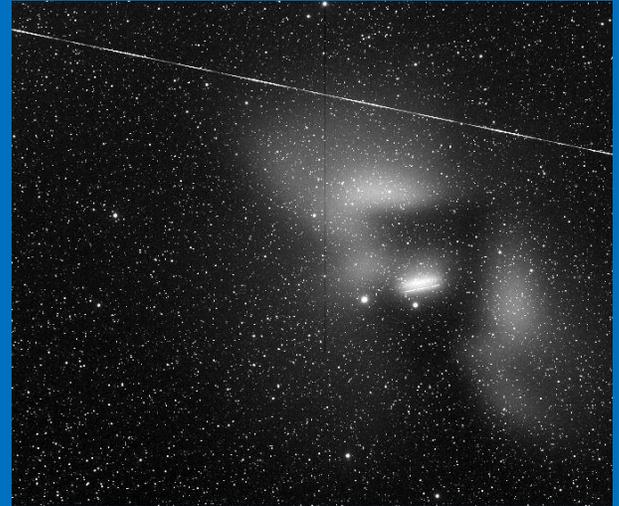
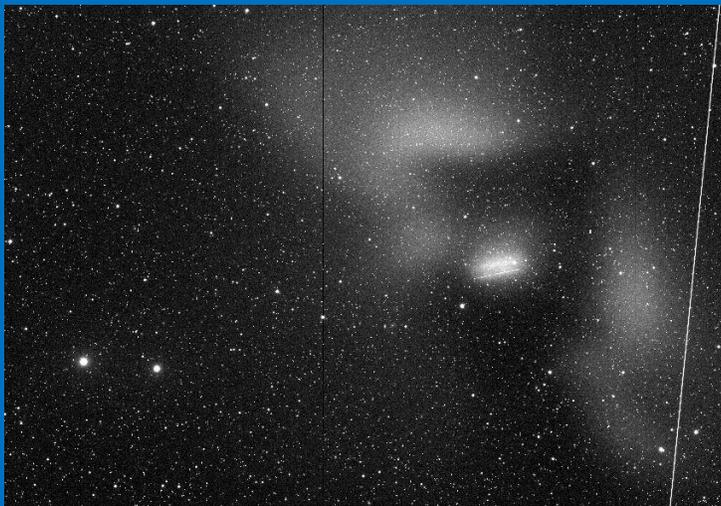
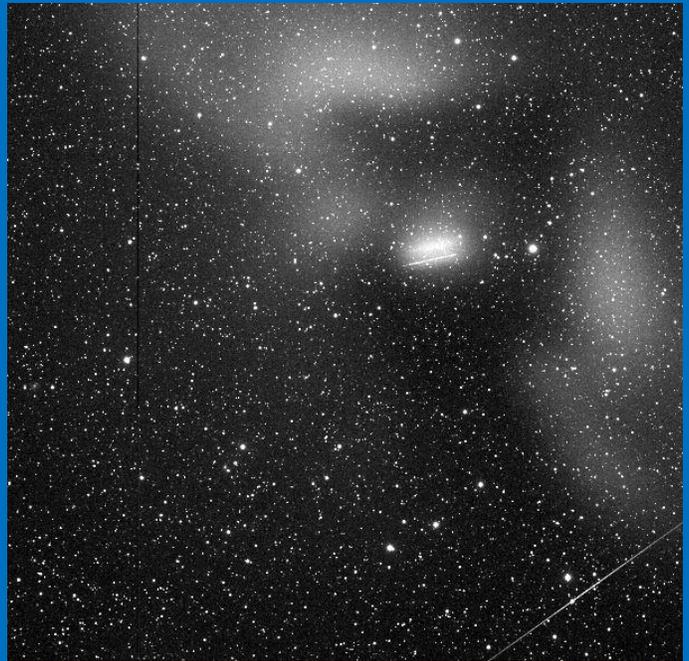
If you would like to see more about satellite tracking, please see the following:

<http://satobs.org/>

There are about 1 billion sources out there for imaging, so I won't bother with that, other than to say that I have been very pleased with [www.itelescope.net](http://www.itelescope.net) and can recommend them. There's quite a learning curve but they are quite fair on pricing and refunds when the weather goes bad or there is a telescope error.

You can also contact me Brad Young at [allenb\\_young@yahoo.com](mailto:allenb_young@yahoo.com)

# Rocket Fuel Venting over Australia





## Comet 21P/Giacobini-Zinner made a nice appearance in Sept.

Excerpts from

<http://earthsky.org/space/2-comets-21p-giacobini-zinner-wirtanen-2018>

*“Skywatchers have had their eye on comet 21P/Giacobini-Zinner, parent object of the Draconid meteor shower. They’ve been picking it up with small telescopes, and capturing its photo, for at least a month now. Comet 21P/Giacobini-Zinner – affectionately called simply 21P by astronomers – came closer to Earth on the night of September 9-10, 2018, than it had in 72 years! It swept past us at a completely safe distance of 36 million miles (58 million km) from our planet. That’s nearly as far from us as the next planet outward in orbit – Mars – is right now. But, for a comet, it’s close!” Its coma was estimated to be about 180,000 miles wide or twice the size of Jupiter.*

During the week of Sept 10 to 15, this 7<sup>th</sup> magnitude comet passed through the region of Auriga and Gemini. In the early morning hours of Sept 12, members John Land and John Moore were able to observe it a few degrees below M37 in Auriga. On Saturday morning Sept 15 it passed directly through the open cluster M35 in Gemini resulting in numerous images being posted online.

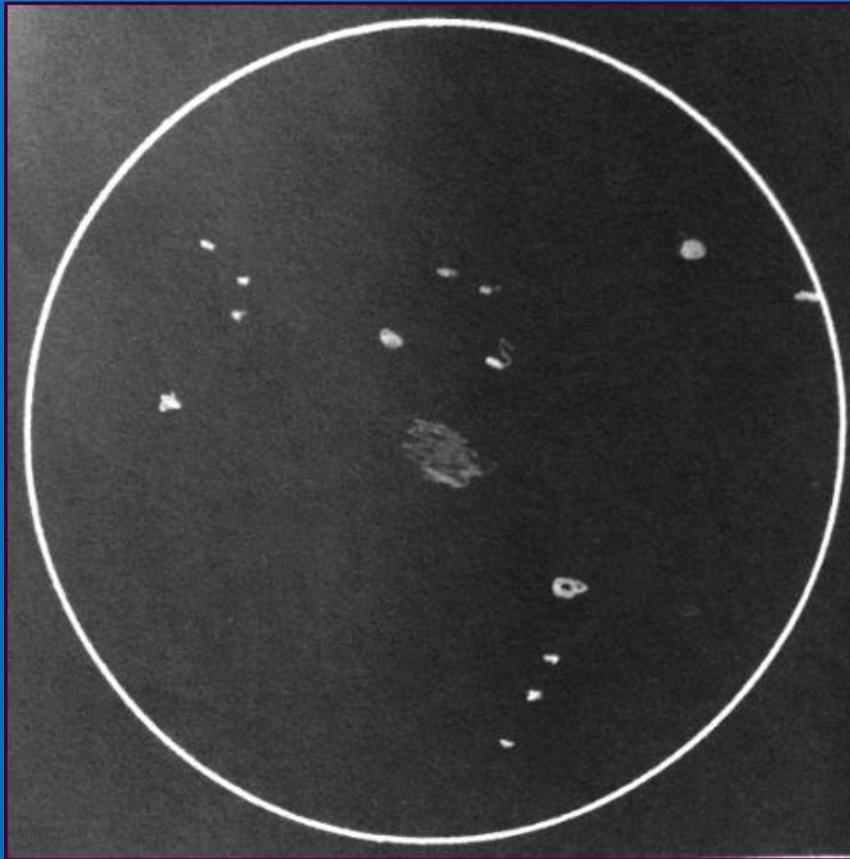
An interesting historical note: On Sept 11, 1985 the International Cometary Explorer, ICE, spacecraft was the first craft to fly through and sample the plasma of a comet. Comet 21 P. On Sept 11, 2018 John Land made his first observation of this comet 21 years to the day of that historical event. Exactly 33 years – 5 orbits later.

[https://en.wikipedia.org/wiki/International\\_Cometary\\_Explorer](https://en.wikipedia.org/wiki/International_Cometary_Explorer)

But do not despair, *21P/Giacobini-Zinner* is the parent body of the **annual Draconid meteor shower** which reaches its peak on the night of Oct 7-8 in dark skies. Several of our club members will be a Okie-Tex that week under pristine dark skies. The Draconid shower normally produces few bright meteors. 2018 may be worth watching as the comet has just passed near the Earth and may result in elevated activity. In 2011 European observers saw a brief outburst reaching rates of 600 per hour! The constellation of Draco sets above the handle of the Big Dipper in the direction of the bright star Vega. Look for it in the NW sky.

<http://earthsky.org/astronomy-essentials/everything-you-need-to-know-draconid-meteor-shower>

Inverted image of Sketch of Comet *21P/Giacobini-Zinner* **1:50 AM Sept 12, 2018**  
By John Land from east BA using a 10" f 5 Dobsonian Telescope – FOV is about 1 degree



Video capture image of Comet *21P/Giacobini-Zinner* **2:05 AM Sept 12, 2018**  
By John Moore from Mounds observatory



# SECRETARY'S MESSAGE

BY JOHN NEWTON



## **A Letter from the Astronomy Club Secretary**

A regularly scheduled Board Meeting was held on Saturday, September 22nd, 2018 at the observatory. However, we only had 6 of the 11 active board members present so we were short of a quorum which prevented us from casting any votes. Nonetheless, topics were reviewed and registered in the club minutes then distributed electronically for all board members to digest and voice their opinions separately.

The basis for this meeting included discussions on upcoming events, status on formed committees, and general topics on ACT business-at-hand.

The intent of the formed committees is to help improve our club member's experience. We encourage and welcome club member participation within each committee, or support on public and member's nights. If you are interested in volunteering your time on behalf of the club, please reach out to Tamara Green or a committee chairperson listed in this letter.

## **Upcoming Events and Activity Awareness:**

The Astronomy Club of Tulsa has two milestone events that are coming over the next two months.

1. It's election time again! Every vote counts so please try to be present to cast your vote towards newly elected positions of the ACT Board of Directors. Voting is planned for the next General Meeting that is scheduled to take place on Friday, October 19th. As usual, this meeting will be held at the Jenks High School Planetarium where ballots will be handed out, counted and hopefully new board members for 2019 will be announced.

Also, as mentioned in previous letters, we are still searching to fill the position of ACT Treasurer. We would like to be considered or know of someone who may qualify for the role of ACT Treasurer please contact Tamara Green (President), Tim Davis (Treasurer) or John Newton (Secretary).

2. The ACT Annual Dinner event is scheduled for Saturday, November 10th. This year's dinner will be held at Jenks Planetarium beginning at 5:30 PM. The menu cuisine style for this year will be Italian food. The Annual Dinner Committee lead by Jerry Cassity are still working on final preparations and are open to volunteers for assisting. Dinner and drinks are priced at \$12 per person, and we ask that our members bring a favorite pot luck dessert to share with the club that evening.

To add to the excitement, the dinner committee plans on selling raffle ticket for Table and Door prizes, with a Grand prize winner being a new Grab and Go type telescope. Exact details to follow. The raffle tickets sales start at the October 19 General Meeting and continue through the night of the annual dinner event in November. Both members and guests alike are eligible to purchase tickets at \$2 apiece, 3 tickets for \$5, or 7 tickets for \$10. The funds generated from the sales of these tickets will go towards a worthwhile cause of purchasing a new Solar Telescope for the club.

The long-awaited Gathering Place has finally opened their doors to the public as Tulsa's newest waterfront park located on Riverside Drive and 31st Street South.

As an opportunity to expand on the awareness of our Astronomy Club, Tamara has contacted someone who seems very interested in expanding the use of the park with educational programs, particularly those that we can offer to the public. In exchange, we hope that The Gathering Place can serve as a secondary or alternate location to the already successful Sidewalk Astronomy sessions held by Owen Green at Bass Pro on regularly scheduled intervals.

A small volunteer group lead by Skip Whitehurst and Sheldon Padawer are planning an evening after dark to walk the park so they can explore areas for dark sky and setting up telescopes for night time viewing. Stay tuned as there will be more to report on this in coming newsletters.

### **ACT Business-at-Hand:**

The board is investigating to reinstate "Astronomy 101" sessions at General Meetings by inviting guest speakers to share their work experiences within their study areas of Space Science (for instance NASA), Physics, and/or Mathematics as it relates to Astronomy. We hope to have them bring new food for thought to us as they share their knowledge and understanding about new and exciting discoveries that are happening from their field of study.

The board is seeking to gain access to the Jenks High School rooftop to spend time after a General Session Meeting to set up a telescope or two for late night viewing. More to come on this topic.

To help build public awareness, new tri-fold brochures have been developed and printed to help advertise the functions and location of the club. You will start to see these at public events and at the observatory to be distributed. We hope that our members are spreading the good news about ACT as there is no better way to advertise than by word of mouth.

Observatory upkeep continues with James Taggart leading the way.

- Friction tape on the stairs and to the second-floor deck needs to be secured with adhesive.
- Most of the major leaks have been identified and sealed. The dome skirt replacement project has been completed. There is still one more leak that is noticeable after a major storm on the main floor still needs to be understood. Caulking the stairs and floors remains to be done.
- Investigating adding a short privacy fence along the east fence line to block bright headlights from blinding observer on the field during observation nights.
- Add visible markers along the driveway is under investigation.
- Trimming trees and bushes, and pickup brush from the storm is needed.
- Spring project suggestion – power wash the exterior and use an epoxy paint application to the outside of the observatory.

### **Committee Updates:**

1. Still looking at Pawhuska as an alternate dark sky site. The committee, with assistance by Tamara Green, has contacted folks at the Pawhuska Chamber, and another person apart from the city to begin the initial discussions for setting the stage of hosting star parties and member's night events. Although contact has been made, the committee is still in the early stages of getting this opportunity completely organized or scheduled. Stay tuned as we hope to report more positive news on this key item.

2. Richard Brady is leading the committee to research on a second club Solar Telescope. The plan for this scope is to be outfitted with hydrogen alpha filters to be used before nightfall. Richard will coordinate his research with Tony White and Owen Green on finding a scope at a reasonable price. The sales of the raffle tickets to be sold at the next two General Sessions will contribute towards the purchase of this telescope.

As the many listed committees undergo their assigned research, the board will continue to monitor progress and post their findings in future newsletters.

Please feel free to contact me with any questions or with your comments at [astrotulsa.secy@gmail.com](mailto:astrotulsa.secy@gmail.com)

*Sincerely,*

*John Newton - ACT Secretary*

# TREASURER'S AND MEMBERSHIP REPORT

BY TIM DAVIS



**Astronomy Club of Tulsa: 180 members, including 44 new members in 2018.**  
**New members for September: Jon Greco, Ryan Wade, Warren Grigsby,**  
**Chanakya Vislavath, Randall Hood and Rechelle Petty.**

**Accounts as of September 30, 2018**

**Checking: \$4,427.97**

**Savings: \$5,779.71**

**Investments: \$23,343.24** *(Value Fluctuates with Market)*

**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. Contact their websites for details.

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

The 2019 Astronomy Magazine Wall Calendars are here and are now available. If you would like to reserve one, send me an email at [astrotulsa.tres@gmail.com](mailto:astrotulsa.tres@gmail.com), or call me at 918-665-8134 and let me know how many you would like. Otherwise, they will be available on a first come, first served basis at our upcoming events. Calendars are available for \$10.00 each, cash, check or credit cards accepted.

Calendars must be picked up in person at a club event, we cannot ship these to you. If you reserve one, just let me know at which event you will pick it up.

Tim Davis  
ACT Treasurer





This article is distributed by NASA Space Place.

With articles, activities and games NASA Space Place encourages everyone to get excited about science and technology. Visit [spaceplace.nasa.gov](http://spaceplace.nasa.gov) to explore space and Earth science!

A video of this article should be available after Oct 1 at <https://solarsystem.nasa.gov/news/526/whats-up-october-2018/>

### 2018 Moon Phases Calendar

Jan	1:○, 8:○, 16:●, 24:○, 31:○
Feb	7:○, 15:●, 23:○
Mar	1:○, 9:○, 17:●, 24:○, 31:○
Apr	8:○, 15:●, 22:○, 29:○
May	7:○, 15:●, 21:○, 29:○
Jun	6:○, 13:●, 20:○, 27:○
Jul	6:○, 12:●, 19:○, 27:○
Aug	4:○, 11:●, 18:○, 26:○
Sep	2:○, 9:●, 16:○, 24:○
Oct	2:○, 8:●, 16:○, 24:○, 31:●
Nov	7:●, 15:○, 22:○, 29:●
Dec	7:●, 15:○, 22:○, 29:●

## Observe the Moon

By Jane Houston Jones and Jessica Stoller-Conrad

This year's International Observe the Moon Night is on Oct. 20. Look for astronomy clubs and science centers in your area inviting you to view the Moon at their star parties that evening!

On Oct. 20, the 11-day-old waxing gibbous Moon will rise in the late afternoon and set before dawn. Sunlight will reveal most of the lunar surface and the Moon will be visible all night long. You can observe the Moon's features whether you're observing with the unaided eye, through binoculars or through a telescope.

Here are a few of the Moon's features you might spot on the evening of October 20:

Sinus Iridum—Latin for “Bay of Rainbows”—is the little half circle visible on the western side of the Moon near the lunar terminator—the line between light and dark. Another feature, the Jura Mountains, ring the Moon's western edge. You can see them catch the morning Sun.

Just south of the Sinus Iridum you can see a large, flat plain called the Mare Imbrium. This feature is called a mare—Latin for “sea”—because early astronomers mistook it for a sea on Moon's surface. Because the Moon will be approaching full, the large craters Copernicus and Tycho will also take center stage.

Copernicus is 58 miles (93 kilometers) across. Although its impact crater rays—seen as lines leading out from the crater—will be much more visible at Full Moon, you will still be able to see them on October 20. Tycho, on the other hand, lies in a field of craters near the southern edge of the visible surface of the Moon. At 53 miles (85 kilometers) across, it's a little smaller than Copernicus. However, its massive ray system spans more than 932 miles (1500 kilometers)! And if you're very observant on the 20th, you'll be able to check off all six of the Apollo lunar landing site locations, too!

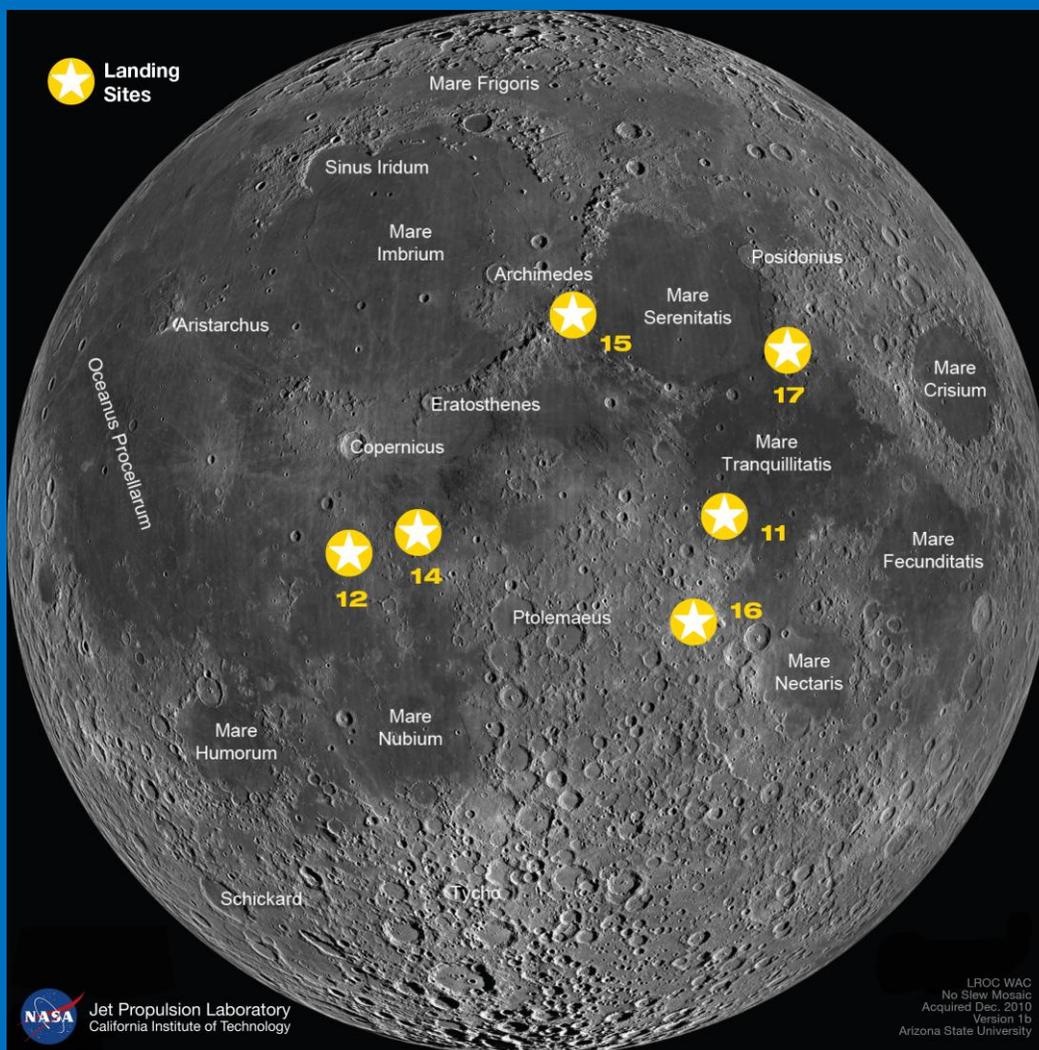
In addition to the Moon, we'll be able to observe two meteor showers this month: the Orionids and the Southern Taurids. Although both will have low rates of meteors, they'll be visible in the same part of the sky.

The Orionids peak on Oct. 21, but they are active from Oct. 16 to Oct. 30. Start looking at about 10 p.m. and you can continue to look until 5 a.m. With the bright moonlight you may see only five to 10 swift and faint Orionids per hour.

If you see a slow, bright meteor, that's from the Taurid meteor shower. The Taurids radiate from the nearby constellation Taurus, the Bull. Taurids are active from Sept. 10 through Nov. 20, so you may see both a slow Taurid and a fast Orionid piercing your sky this month. You'll be lucky to see five Taurids per hour on the peak night of Oct. 10.

You can also still catch the great lineup of bright planets in October, with Jupiter, Saturn and Mars lining up with the Moon again this month. And early birds can even catch Venus just before dawn!

You can find out more about International Observe the Moon Night at <https://moon.nasa.gov/observe>



*Caption: This image shows some of the features you might see if you closely observe the Moon. The stars represent the six Apollo landing sites on the Moon. Credit: NASA/GSFC/Arizona State University (modified by NASA/JPL-Caltech)*

## EARN the **LUNAR OBSERVING CERTIFICATE** from the Astronomical League



Get to know the moon and its features by completing the Lunar 100 Certificate. This certificate can be done from urban areas and requires only modest equipment. These 100 features are broken down into three groups: 18 naked eye, 46 binocular, and 36 telescopic features. Any pair of binoculars and any telescope may be used for this program. As a matter of fact, to prove that the Lunar Program could be done with small apertures, we used 7x35 binoculars and a 60mm refractor. It's a great way to get to know our nearest celestial neighbor and develop your observing skills. When you have completed your certificate, you get a nice pin and framable certificate. The League has dozens of other observing certificates from Novice Levels to Advanced observers.



### JENKS PLANETARIUM

Jenks High School Campus  
205 East B Street, Jenks

#### TICKETS

\$5 online or \$7 at the door

Purchase online at [jenkscommunityed.com](http://jenkscommunityed.com)

or call 918-298-0340

2018 [Go to Show Schedule](#)

Then click the **Date Column** to sort them by show date

**Shows take place on Tuesday evenings from 7:00 PM to 8:00 PM**

Explore the night sky with engaging, awe-inspiring shows at the Jenks Planetarium. The 50-foot dome provides the ultimate screen for seeing planets up close, flying to distant galaxies, and even rediscovering our own earth in ways never thought possible.



**How to  
use my  
telescope**



**TUESDAY OCT 13 8:00 TO 9:00 pm**

Register now [Click Link Here](#)

Do you have a telescope but don't get it out because it doesn't seem to work? Bring it to the planetarium this night and together we will learn about the telescope and how it operates. We will then take them to the roof-top observation deck and practice our new skills! This show is weather permitting. Please dress for the weather. The target audience for How to Use My Telescope is ages 6 years to adult. This show is held at the Jenks Planetarium, Jenks High School, Dr. Kirby A. Lehman Center for the Study of Math and Science Center, 3rd Floor. Elevator available. General Seating. 1 show.

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.

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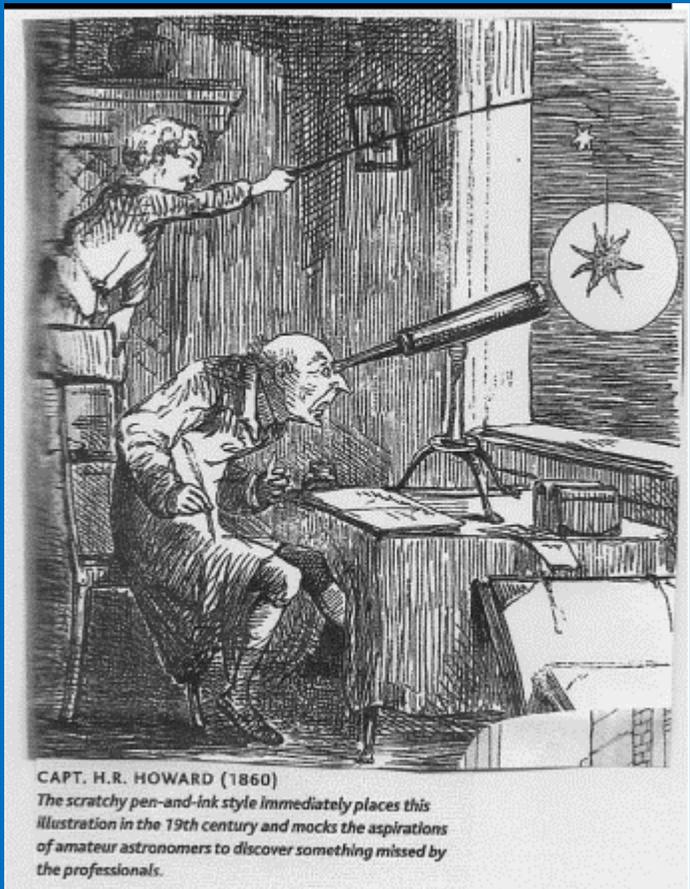
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