

# THE ★ OBSERVER

1937



2012

The Astronomy Club of Tulsa



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***(NOTE: THESE OFFICES ARE IN TRANSITION AND THE INFORMATION WILL BE UPDATED FOLLOWING THE ELECTIONS OF OFFICERS AND BOARD FOR 2013)***

***COVER DESIGN: JERRY MULLENIX***

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November 2012  
Tulsa, Oklahoma

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1 Sunrise: 7:46am Sunset: 6:26pm Moonrise: 8:23pm Moonset: 10:17am	2 <b>Public Star Party</b> Sunrise: 7:47am Sunset: 6:27pm Moonrise: 9:15pm Moonset: 11:06am	3 Sunrise: 7:48am Sunset: 6:26pm Moonrise: 10:10pm Moonset: 11:51am
4 DST Ends Sunrise: 6:49am Sunset: 6:25pm Moonrise: 10:05pm Moonset: 11:33am	5 Sunrise: 6:50am Sunset: 5:24pm Moonrise: 11:02pm Moonset: 12:11pm	6 Sunrise: 6:51am Sunset: 5:23pm Moonrise: none Moonset: 12:47pm Last Qtr: 6:37pm	7 Sunrise: 6:52am Sunset: 5:22pm Moonrise: 12:01am Moonset: 1:20pm	8 Sunrise: 6:53am Sunset: 5:21pm Moonrise: 1:01am Moonset: 1:53pm	9 M.O.O.N. Sunrise: 6:54am Sunset: 5:21pm Moonrise: 2:04am Moonset: 2:27pm	10 Sunrise: 6:55am Sunset: 5:20pm Moonrise: 3:09am Moonset: 3:02pm
11 Sunrise: 6:56am Sunset: 5:19pm Moonrise: 4:16am Moonset: 3:40pm	12 Sunrise: 6:57am Sunset: 5:18pm Moonrise: 5:27am Moonset: 4:23pm	13 Sunrise: 6:58am Sunset: 5:18pm Moonrise: 6:38am Moonset: 5:12pm New Moon: 4:09pm	14 Sunrise: 6:59am Sunset: 5:17pm Moonrise: 7:49am Moonset: 6:08pm	15 Sunrise: 7:00am Sunset: 5:16pm Moonrise: 8:56am Moonset: 7:11pm	16 <b>A.C.T. Dinner Meeting</b> Sunrise: 7:01am Sunset: 5:15pm Moonrise: 9:56am Moonset: 8:17pm	17 Sunrise: 7:02am Sunset: 5:15pm Moonrise: 10:49am Moonset: 8:25pm
18 Sunrise: 7:03am Sunset: 5:14pm Moonrise: 11:34am Moonset: 10:32pm	19 Sunrise: 7:04am Sunset: 5:14pm Moonrise: 12:13pm Moonset: 11:37pm	20 Sunrise: 7:05am Sunset: 5:13pm Moonrise: 12:48pm Moonset: none First Qtr: 8:33am	21 Sunrise: 7:06am Sunset: 5:13pm Moonrise: 1:20pm Moonset: 12:39am	22 <b>Thanksgiving</b> Sunrise: 7:07am Sunset: 5:12pm Moonrise: 1:50pm Moonset: 1:39am	23 Sunrise: 7:08am Sunset: 5:12pm Moonrise: 2:21pm Moonset: 2:37am	24 <b>Sidewalk Astronomy</b> Sunrise: 7:09am Sunset: 5:11pm Moonrise: 2:52pm Moonset: 3:34am
25 Sunrise: 7:10am Sunset: 5:11pm Moonrise: 3:26pm Moonset: 4:30am	26 Sunrise: 7:11am Sunset: 5:11pm Moonrise: 4:02pm Moonset: 5:25am	27 Sunrise: 7:12am Sunset: 5:10pm Moonrise: 4:42pm Moonset: 6:20am	28 Sunrise: 7:13am Sunset: 5:10pm Moonrise: 5:25pm Moonset: 7:13am Full Moon: 8:47am	29 Sunrise: 7:14am Sunset: 5:10pm Moonrise: 6:14pm Moonset: 8:03am	30 Sunrise: 7:15am Sunset: 5:10pm Moonrise: 7:05pm Moonset: 8:49am	

Courtesy of www.sunrisesunset.com  
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## UPCOMING EVENTS

Public Star Party	Fri, Nov 2	ACT Observatory	6:00 PM
Members' Night	Fri, Nov 9	ACT Observatory	6:00 PM
Dinner Meeting	Fri, Nov 16	TASM Planetarium	7:00 PM
<i>(Dinner Meeting is for Club members and their families only please.)</i>			
Thanksgiving Day	Thu, Nov 22		
Public Star Party	Fri, Dec 7	ACT Observatory	6:00 PM
Members' Night	Fri, Dec 14	ACT Observatory	6:00 PM

*NOTE: No General Meeting or Sidewalk Astronomy event in December due to the close proximity to the Holidays.*

## President's Message

By Your *Newsletter Editor*??????

Now, before you say, "Wait a minute....."

There is no President's Message in this edition of the newsletter, as the office is currently in transition, and as of the Dinner Meeting on November 16, Ann Bruun will be stepping down and a new President will be stepping up to take her place.

As most of you may know, we did not have an election at our October meeting due to not having a quorum present. So it was decided at that meeting that the elections will take place at the November Dinner Meeting. So, all y'all need to come on out to TASM on November 16, enjoy some good BBQ and vote in your Officers and Board for 2013!

I just want to give Ann a big fat thank-you for doing such a good job as President for 2012, and another big fat thank-you to Owen Green for taking the ball for the team and running for President. We all owe both of these fine people a debt of gratitude for their service to our Club!

I hope all of you will give Owen and all the rest of our Officers and Board your continued support and encouragement. I look forward to another great year!

Your Editor,

Tamara



# Membership and Treasurer's Report

By John Land

***Notice – Be sure your membership is current in order to vote at the club's annual elections at our November meeting.***

<b>Astronomy Club of Tulsa - Treasurer Report</b> by John Land			
The club has <b>112 members</b> including <b>27 new memberships</b> this year			
In 2012 - <b>165</b> people requested information on the website visitor section			
<b>Newest Members</b>	<b>James Phillips</b>	<b>Jim Wolfe</b>	
<b>Expenses</b>	<b>Deposits</b>	<b>Balance</b>	<b>Checking Account</b>
		\$ 1,332.57	Oct 11 Balance
	\$ 338.00	\$ 1,670.57	Deposits
\$ 97.54		\$ 1,573.03	Operational Expenses
\$ 68.00		\$ 1,505.03	Member Mag Subscriptions
		\$ 1,505.03	<b>Nov 7 Balance</b>
		\$ 7,004.37	Oct 11 Balance
		\$ 7,007.03	<b>Nov 7 Balance</b>
<b>Investment Account - End of month</b>		<b>Account Value varies with Market</b>	
\$ 15,682.28	<b>Jan-12</b>	<b>June</b>	\$ 16,231.22
\$ 16,067.68	<b>Feb</b>	<b>July</b>	\$ 16,506.73
\$ 16,217.08	<b>Mar</b>	<b>August</b>	\$ 16,663.61
\$ 16,240.96	<b>Apr</b>	<b>Sept</b>	\$ 16,888.29
\$ 15,611.46	<b>May</b>	<b>Oct</b>	\$ 16,904.19



## 2012 Election Candidates, by John Land



### **President, Owen Green**

**Owen has been a member of the club since 2003.**

He currently serves as Side Walk Astronomy coordinator and helps with other volunteer efforts. Owen has served on the board and as President in 2011. Here Owen is helping a new telescope owner learn how to use his scope.



### **Vice President, Lee Bickle**

“The club has been serving me for years as often as I've attended its observing events and used its facilities. Only recently have I paid dues and volunteered a little time here and there as a member, so I am happy to give back to the club in an elected volunteer capacity when the club offers. That's why I'm accepting nomination.”



### **Secretary, Tamara Green**

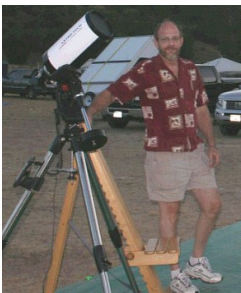
Tamara has been in the club since 2003 when she and Owen showed up to observe the close approach of Mars. She has served enthusiastically in several positions. Board Member - President - Secretary Tamara is always willing to volunteer at club events.



### **Treasurer, John Land**

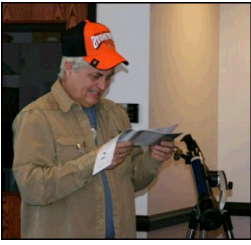
Growing up during the Space Race to the Moon, I have always loved astronomy. I joined the club in May of 1977 and was blessed to have several members mentor me in learning the skills of observing.

Upon moving to Broken Arrow I was doubly blessed by being asked to start teaching an astronomy course at the High School which I did for 28 years. Over the years I have served in several club capacities including my current post of Treasurer which I began in 2002



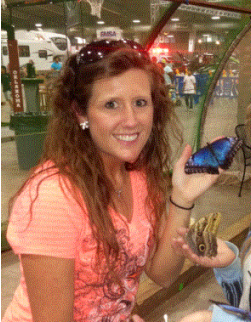
### **Board, Michael Blaylock**

Michael has been a valued member of the club since 2009. He helped organize a special interest group to make Dobsonian telescope mounts in his well equipped woodshop. Michael is always glad to welcome guests to look through his telescopes. Currently he is working at the Tulsa Air & Space Museum.



**Board, Stan Davis**

Stan has been a valued member of the club since 2007 and volunteers his time and talents in many ways. Shown here he is helping out with Telescope 101 class at TASM. Stan is currently an acting member of the board.



**Board, Mandy Nothnagel**

Mandy joined our club in 2011 with all the enthusiasm of a new star struck astronomer. She is proud of her 6 inch Orion telescope and has volunteered at several club outreach events.



**Board, Christopher Proctor**

Chris joined the club in 2008 and has been an active participant ever since. He currently serves as our facilities manager taking care to the observatory and its lawn care. He also is active in running the 14 inch telescope shows on public nights and special groups.



**Board, Jody Ray-Fleetwood**

Jody has been associated with our club for several years as she began bringing her daughter to visit on observing nights. Since she lives near the observatory she is able to help out with projects and wants to be more involved in the club.

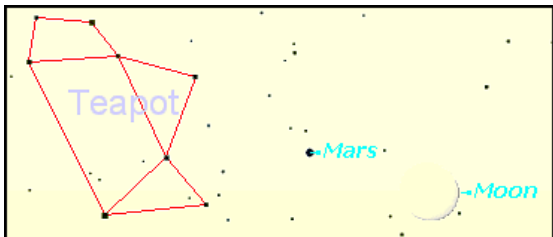


**Board, Tony White**

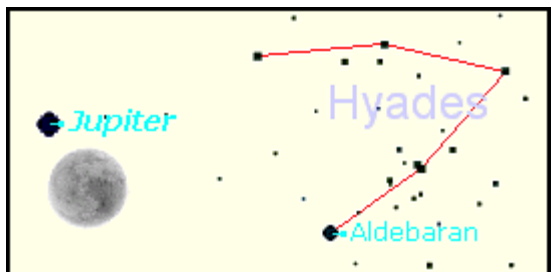
Tony has been a member of the club since 2001. He has served in many positions including board – President and Vice President. Everyone loves to see Tony arrive and discover what new astronomy telescope or gadget. He has added to his collection. He also volunteers with Boy & Girl Scouts groups.

## PLANETS in November

By John Land



Tiny reddish **Mars** is about 10 degrees up low in the SW as the evening dusk falls. Image shown is for early evening Nov 15<sup>th</sup>. After a spectacular landing Aug 5 the Mars Science Laboratory named Curiosity has begun its exploration of the Gale crater. Keep up with all the discoveries at <http://mars.jpl.nasa.gov/msl/>



**Jupiter** rises in the NE about 7:45 PM but isn't high enough for good viewing for another hour or so. Jupiter and the Full Moon will rise only 1 degree apart on Weds evening Nov 28<sup>th</sup>. Recent observations report activity in the Northern Cloud belt. Jupiter should be putting on a fine show for observers throughout the winter months.



**Venus** rises about 4:15 AM in the East in the constellation of Virgo. Early morning risers will see Venus and a thin crescent moon together on Sunday morning Nov 11. **Saturn and Venus** are less than 1 degree apart on the mornings of Nov 26 and 27.



The View from Saturn will show a close conjunction of Earth and Venus.

## TRANSIT of VENUS from Saturn Dec 21, 2012



The Cassini spacecraft orbiting Saturn will be able to witness an other worldly transit of Venus. The event should start about 13:00 UT ( 7:00 AM CST ) and last until 22:00 UT Mission scientist hope to use the cameras on Casinni

To observe the transit and use that information toward observations of planets transiting other stars.

<http://www.newscientist.com/article/dn21880-watching-the-transit-of-venus-from-saturn.html>

## Couple of Meteor showers coming up

**The Leonids on Nov 16 – 17** Most years the Leonids only produce a few fast meteors per hour. Leo Rises about midnight in a moonless sky

**The Geminid shower Dec 12 –13** should be great this year also since it occurs on the day of new moon. This shower can produce 60 or meteors per hour in a dark sky. Gemini rises about 6:30 PM and is up all night.



*Planets in November, by John Land, Ct'd.*



To Find out about all the astronomical events coming up

Get your **2013 Astronomy Wall Calendar \$ 10 each**

At meetings or Contact John Land

The calendar is filled with stunning images of stars, planets, galaxies, and other deep space wonders. A highly informative essay accompanies each inspiring photograph. For each month, celestial viewing opportunities, historical events, and national holidays are listed. [View a portion of this product!](#)



# The Secretary's Stuff

## By Tamara Green

### ASTRONOMY CLUB OF TULSA – MINUTES – GEN. MEETING FRI OCT 26, 2012

**PRESENT:**

- Ann Bruun, President
- Tony White, Vice President
- Tamara Green, Secretary
- John Land, Treasurer
- Bill Goswick, Board
- Owen Green, PR/OR/SW

T

**NOT PRESENT:**

- Tim Davis, Board
- Teresa Davis, Board
- Christopher Proctor, Facilities Manager
- Tom McDonough, Board
- Stan Davis, Board
- Catherine Kahbi, Board
- Jennifer Jones, Webmaster

The meeting was held at Tulsa Community College, Northeast Campus. There were 16 attendees,

**WELCOME AND INTRODUCTION:**

Ann called the meeting to order at 7:30 PM and welcomed all attendees.

**PROGRAM:**

Election of Officers and Board for 2013. (NOTE: NO QUORUM SO THE ELECTIONS WERE NOT HELD THIS EVENING.)

**OFFICERS'/STAFF REPORTS:**

**PRESIDENT – Ann had no report, no quorum as of 7:20.**

**VICE PRESIDENT-** Tony announced the workday at the observatory on the 27<sup>th</sup>. Volunteers are needed at 10 AM. Chris unable to make the meeting but Tony passed along the message that Chris will be at the observatory.

**SECRETARY –** Tamara read the minutes from the September meeting.

**TREASURER –**John went over the club financial information, and we have one new member, we are up to 110 members. John mentioned that the dinner meeting will begin at 6:30 PM instead of at 7:00 PM to give everyone time to eat and enjoy the planetarium show. John needs volunteers to help decorate the tables for the dinner, as it is our 75<sup>th</sup> Anniversary.

**FUNDRAISING –**Catherine not present, no report.

**OBSERVING –** Tamara had no report.

*The Secretary's Stuff, Ct'd.*

**GROUPS** – Jennifer not present. John mentioned a group event at the observatory scheduled for Nov. 10 (Sat.) Legacy Christian Academy, about 30 people.

**FACILITIES** – Tony more or less gave Chris' report.

**PR/OUTREACH/SIDEWALK** – Owen announced the sidewalk event at Bass Pro at 6:30 PM.

**NIGHT SKY NETWORK** – Teresa not here, but Ann mentioned that every member is now on the NSN list for event notifications.

**OTHER BUSINESS:** Ann mentioned that there were two people who were interested in being on the board but are not yet eligible. They are welcome to come to meetings and can be put on the board mailing list. The elections will be held at the dinner meeting, as there was no quorum. We only had 16 members present, but we needed 20.

Richie made a suggestion that we amend the by-laws to change the election meeting to the November dinner meeting instead of October, as we would be more likely to have a quorum then. Another member suggested that we include board meetings on the NSN events mailing.

Ann mentioned that there are as of yet no nominations for president. She made an observation that we have 110 members now, so if everyone served as president for one year, we could only have to be president once every 110 years. She then showed pics of candidates for offices and board and went over upcoming events.

Work Day, Sat. Oct. 27, Observatory, 10:00 AM

Sidewalk Astronomy, Sat. Oct. 27, Bass Pro, 6:30 PM.

Public Star Party, Fri. Nov. 2, Observatory, 6:00 PM.

Member's Night, Fri. Nov. 9, Observatory, 6:00 PM.

Dinner Meeting, Fri. Nov. 16, TASM, 6:30 PM.

Public Star Party, Fri. Dec. 7, Observatory, 6:00 PM.

Members' Night, Fri. Dec. 14, Observatory, 6:00 PM.

Following the business, Ann showed some videos that John found for us.

The meeting was adjourned at 8:05 PM.



# the Space Place

November–December 2012 / Vol. 5, Issue 5



## NEWS AND NOTES FOR FORMAL AND INFORMAL EDUCATORS

The Space Place is a NASA website for elementary school-aged kids, their teachers, and their parents.

It's colorful!  
It's dynamic!  
It's fun!

It's rich with science, technology, engineering, and math content!

It's informal.  
It's meaty.  
It's easy to read and understand.  
It's also in Spanish.  
And it's free!

It has over 150 separate modules for kids, including hands-on projects, interactive games, animated cartoons, and amazing facts about space and Earth science and technology.

*Earth is a water world. Even if we live far from the ocean, we feel its effects. We feel it in the weather and climate. We breathe in the oxygen produced by its plant life. We are cooler for the ocean's ability to absorb some of the excess greenhouse gases we add to the atmosphere. The ocean influences every aspect of our planet that make it habitable. The Space Place website is about space out there and Earth down here as studied from space out there. This month we pay tribute to the ocean and the technologies that help us understand it better.*

### What's new on Space Place

When Earth first formed, it was very hot. Any liquid water would have boiled away into space. So where did the ocean come from? Scientists think comets may have provided an important water delivery service. But how can they know?



A new "Explore" article on the Space Place explains how even water has fingerprints of sorts that can be used to trace its origin. Visit [spaceplace.nasa.gov/comet-ocean](http://spaceplace.nasa.gov/comet-ocean).

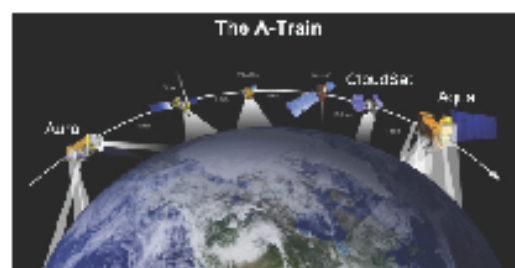
### Space Place en español

Satellite images show the swirling, organized rotational cloud systems of tropical storms and hurricanes. We can watch them

in fascination—or fear, if they are headed our way. What is actually going on in the belly of these monsters? How do they begin and grow? What determines their severity and their path? In both English and Spanish, the basics are explained. Check out ¿Cómo se forman los huracanes? And see Space Place entirely in Spanish at [spaceplace.nasa.gov/sp](http://spaceplace.nasa.gov/sp), with toggles to the English on every page.



### Spotlight on . .



"Missions to Planet Earth" is an online card game. It started out as a real card game, but we wanted everyone to be able to enjoy playing it and learn about what it takes to build a space mission. The player competes with the computer, but can tell the computer how "smart" to play. So beginners can succeed too. The object is to gather all the necessary components to complete the maximum number of missions—before the

Where kids and grown-ups have fun with space science and technology



computer opponent does. This is a great game for the classroom when students have a few minutes to spare. Go to [spaceplace.nasa.gov/earth-card-game](http://spaceplace.nasa.gov/earth-card-game).

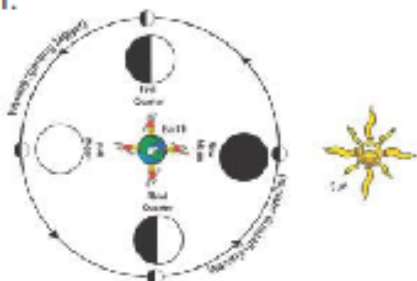
### For the classroom



"Voyage on the High Seas: A Jason I Ocean Adventure" is a real board game. Go to [spaceplace.nasa.gov/posters/high\\_seas](http://spaceplace.nasa.gov/posters/high_seas) to download a full-size game board (42.5 x 33 inches). You can have it printed—and perhaps laminated—at an office supply store. There are also game cards to print on standard paper and cut apart, as well as a spinner and tiny game markers (research vessels). The game is a fun way for students to learn some geography, oceanography, and meteorology. The back side of the poster (printable on standard paper) has other related activities and articles as well.

### For out of school (cookie) time

We leave the ocean theme for a moment to tell you of our new Oreo® cookies Moon phases activity. It reduces the oft-confusing topic of Moon phases to its simplest—and sweetest—form. To make a new Moon, eat all the crème filling. To make a 1<sup>st</sup> or 3<sup>rd</sup> quarter Moon, scrape off half the filling. For a full Moon, alas, you must resist. Printable activity sheets make it easy for the activity director. Go to [spaceplace.nasa.gov/oreo-moon](http://spaceplace.nasa.gov/oreo-moon).



### Special Days

**Nov. 9, 1934: Carl Sagan was born.**

Dr. Sagan helped pick the sounds and images for the Voyager spacecrafts' "Golden Record." See and hear samples at [spaceplace.nasa.gov/voyager-to-stars](http://spaceplace.nasa.gov/voyager-to-stars).

**Nov 13, 1946: Vincent Joseph Schaefer made the first artificially induced snowstorm.**

It's easy to predict a snowstorm if you make it yourself. If nature makes it ...not so much. Check out a little booklet that explains in the simplest possible terms how to make a weather-prediction satellite. It's at [spaceplace.nasa.gov/story-weather-satellite](http://spaceplace.nasa.gov/story-weather-satellite). The booklet is also in Spanish and Italian.



**Nov 29, 1803: Birthday of Christian Doppler.**

He described the Doppler effect, a good analogy for the expansion of space and understanding why the sky is dark at night. Check it out at [spaceplace.nasa.gov/classroom-activities#bluesky](http://spaceplace.nasa.gov/classroom-activities#bluesky).

**Dec. 14: Geminids Meteor Shower**

Get tips on the best meteor viewing techniques at [spaceplace.nasa.gov/meteor-shower](http://spaceplace.nasa.gov/meteor-shower).

**Dec. 25, 1642: Birthday of Isaac Newton.**

He understood how orbits work, and so can you by firing a cannon into space. With enough gunpowder, you, too, can achieve orbit! Go to [spaceplace.nasa.gov/how-orbits-work](http://spaceplace.nasa.gov/how-orbits-work).



**Dec. 31, 1705: First recorded sighting of Halley's comet.**

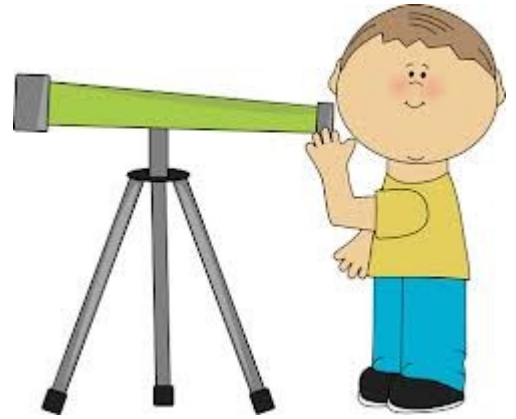
Play Comet Quest and learn about comets at [spaceplace.nasa.gov/comet-quest](http://spaceplace.nasa.gov/comet-quest).

### Don't forget . . .

You can find dozens of other ideas and rich resources for the classroom and out of school time at our Parents & Educators page, [spaceplace.nasa.gov/menu/parents-and-educators](http://spaceplace.nasa.gov/menu/parents-and-educators).







More fun stuff for the young astronomers!

Check out these webpages!

<http://climate.nasa.gov/kids>

<http://scijinks.gov>

<http://spaceplace.nasa.gov>





All Astronomy Club of Tulsa Members and their Families are invited to join in the fun



## ANNUAL DINNER MEETING



FRIDAY, NOVEMBER 16  
TASM PLANETARIUM  
3624 N. 74th E. Ave. Tulsa,  
OK



7:00 PM

Catered by Billy Simm's BBQ

Great Food

Door Prizes

Group Photo



Hope to see you there!



## Where We Meet:

**TCC Northeast Campus, 3727 E. Apache St., Student Union Bldg. 2, Room 1603**

There is PLENTY of parking, lighting and security on this campus.

To get to TCC NE Campus, take the Harvard Exit off of Hwy. 11 (Gilcrease Expressway). Go south for about 1/2 mile to the campus located at the corner of N. Harvard and Apache. Turn east on Apache and take the entrance in front of Bldg. 3 (the large round building). Then turn right and park in front of Student Union Building #2. Room 1603 is just off of the lobby.

**Google-type driving direction map at <http://www.tulsacc.edu/13273/>**

**We hope to see you there!**



***Next General Meeting will be in January of 2013, date, time and program TBA.***

***No General Meeting in December 2012 due to close proximity to the Christmas Holiday.***

## CLUB OFFICERS

PRESIDENT	
VICE PRESIDENT	
SECRETARY	TAMARA GREEN 918-851-1213
TREASURER	JOHN LAND 918-695-3195

## BOARD MEMBERS AT LARGE

STAN DAVIS	918-294-3196
BILL GOSWICK	918-742-6146

## APPOINTED STAFF

NEWSLETTER EDITOR	TAMARA GREEN 918-851-1213
FACILITIES MANAGER	CHRISTOPHER PROCTOR 918-810-6210
MEMBERSHIP CHAIRMAN	JOHN LAND 918-695-3195
OBSERVING CO-CHAIRS	OWEN & TAMARA GREEN 918-851-1213
GROUP DIRECTOR	JENNIFER JONES 918-629-8732
PR/OUTREACH/SIDEWALK ASTRONOMY	OWEN GREEN 918-851-8171
NIGHT SKY NETWORK	TERESA DAVIS 918-637-1477
WEBMASTER	JENNIFER JONES 918-629-8732
FUNDRAISING CHAIR	CATHERINE KAHBI 918-230-8480

## MEMBERSHIP INFORMATION

### MEMBERSHIP RATES FOR 2012 WILL BE AS FOLLOWS:

Adults - \$45 per year. Includes Astronomical League membership.

Senior Adults - \$35 per year. *For those aged 65 and older.* Includes Astronomical League membership.

Students - \$30 per year. Includes Astronomical League Membership.

Students - \$25 per year. *Does not include Astronomical League membership.*

The regular membership allows all members of the family to participate in Club events, but only ONE voting membership and ONE Astronomical League membership per family.

Additional Family Membership - \$15 with Astronomy Club of Tulsa voting rights, \$20 with Club voting rights *and* Astronomical League membership.

*THOSE WISHING TO EARN ASTRONOMICAL LEAGUE OBSERVING CERTIFICATES NEED TO HAVE A LEAGUE MEMBERSHIP.*

### MAGAZINES:

Astronomy is \$34 for one year or \$60 for 2 years.

[www.astronomy.com](http://www.astronomy.com)

Sky & Telescope is \$33 per year.

[www.skyandtelescope.com](http://www.skyandtelescope.com)

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

*If you are an existing S&T subscriber, you can renew directly with S&T at the same Club rate. Both S&T and Astronomy now have digital issues for computers, iPads and smart phones.*

## ONLINE REGISTRATION

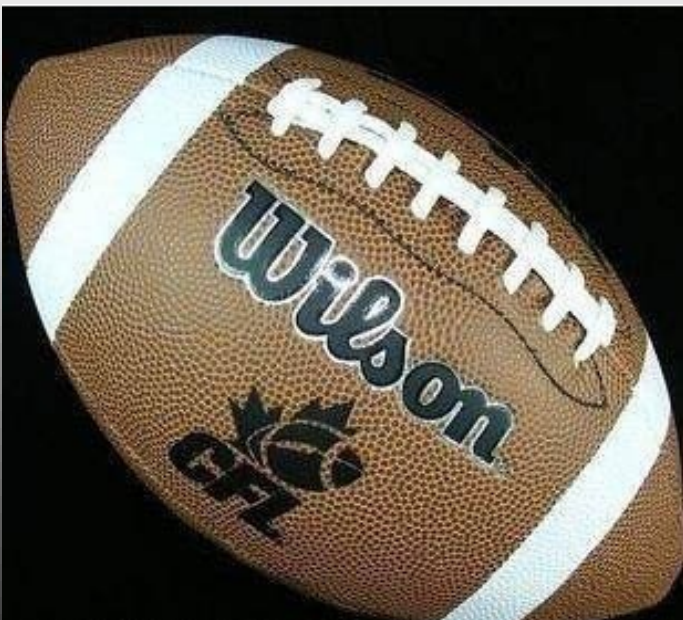
We now have an automated online registration form on the website for new memberships, membership renewals and magazine subscriptions. Just simply type in your information and hit "send" to submit the information. You can then print a copy of the form and mail it in with your check. At this time we do not have an option for credit card payment, but we may explore that at a later time.

Link: <http://www.astrotulsa.com/Club/join.asp>





# Happy Thanksgiving!!



Have fun and  
stay safe!



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