



Astronomy Club of Tulsa
Observer
December 2012



Photo: Club members gather for a group photo at the Annual Dinner Meeting held at TASM, November 16, 2012.

Photo by Tamara Green (using one of those spiffy remote-control-shutter-release deals!)

Permission to reprint anything from this newsletter is granted, **PROVIDED THAT CREDIT IS GIVEN TO THE ORIGINAL AUTHOR AND THAT THE ASTRONOMY CLUB OF TULSA "OBSERVER" IS LISTED AS THE ORIGINAL SOURCE.** For original content credited to others and so noted in this publication, you should obtain permission from that respective source prior to re-printing. Thank you very much for your cooperation. Please enjoy this edition of the Observer.

HAVE A SAFE AND HAPPY HOLIDAY SEASON, AND SEE YOU IN 2013!!!!!!!



Inside This Edition:

Article/Item	Page
Calendar and Upcoming Events	3
President's Message, by Owen Green	4
Treasurer's and Membership Report, by John Land	5
Event Announcement: Telescopes 101 at TASM	6
The Secretary's Stuff, by Tamara Green	7
<i>"December-Skies to Stars-The Christmas Star", by Ed Downs</i> <i>(With added information by John Land)</i>	8
<i>NASA's The Space Place Newsletter, Nov/Dec 2012</i>	11
Help Needed! Hobbyist Survey, North Carolina St. University	14
Where We Meet	17
Officers, Board and Staff Info	18

December 2012
Tulsa, Oklahoma

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 Sunrise: 7:16am Sunset: 5:09pm Moonrise: 7:59pm Moonset: 9:32am
2 Sunrise: 7:17am Sunset: 5:09pm Moonrise: 8:55pm Moonset: 10:11am	3 Sunrise: 7:18am Sunset: 5:09pm Moonrise: 9:52pm Moonset: 10:47am	4 Sunrise: 7:19am Sunset: 5:09pm Moonrise: 10:51pm Moonset: 11:21am	5 Sunrise: 7:20am Sunset: 5:09pm Moonrise: 11:51pm Moonset: 11:53am	☾ 6 Sunrise: 7:20am Sunset: 5:09pm Moonrise: none Moonset: 12:25pm Last Qtr: 9:33am	7 Public Star Party Sunrise: 7:21am Sunset: 5:09pm Moonrise: 12:53am Moonset: 12:56pm	8 Sunrise: 7:22am Sunset: 5:09pm Moonrise: 1:57am Moonset: 1:33pm
9 Sunrise: 7:23am Sunset: 5:09pm Moonrise: 3:03am Moonset: 2:13pm	10 Sunrise: 7:24am Sunset: 5:09pm Moonrise: 4:13am Moonset: 2:57pm	11 Sunrise: 7:24am Sunset: 5:09pm Moonrise: 5:23am Moonset: 3:49pm	12 Sunrise: 7:25am Sunset: 5:10pm Moonrise: 6:32am Moonset: 4:48pm	☽ 13 Sunrise: 7:26am Sunset: 5:10pm Moonrise: 7:37am Moonset: 5:53pm New Moon: 2:43am	14 M.O.O.N. Sunrise: 7:27am Sunset: 5:10pm Moonrise: 8:35am Moonset: 7:03pm	15 Sunrise: 7:27am Sunset: 5:10pm Moonrise: 9:25am Moonset: 8:13pm
16 Sunrise: 7:28am Sunset: 5:11pm Moonrise: 10:08am Moonset: 9:21pm	17 Sunrise: 7:29am Sunset: 5:11pm Moonrise: 10:46am Moonset: 10:26pm	18 Sunrise: 7:29am Sunset: 5:11pm Moonrise: 11:20am Moonset: 11:29pm	☽ 19 Sunrise: 7:30am Sunset: 5:12pm Moonrise: 11:52am Moonset: none First Qtr: 11:20pm	20 Sunrise: 7:30am Sunset: 5:12pm Moonrise: 12:23pm Moonset: 12:29am	21 Sunrise: 7:31am Sunset: 5:13pm Moonrise: 12:55pm Moonset: 1:27am	22 Sunrise: 7:31am Sunset: 5:13pm Moonrise: 1:27pm Moonset: 2:24am
23 Sunrise: 7:32am Sunset: 5:14pm Moonrise: 2:03pm Moonset: 3:20am	24 Sunrise: 7:32am Sunset: 5:14pm Moonrise: 2:41pm Moonset: 4:15am	25 Sunrise: 7:33am Sunset: 5:15pm Moonrise: 3:24pm Moonset: 5:08am	26 Sunrise: 7:33am Sunset: 5:15pm Moonrise: 4:10pm Moonset: 5:59am	27 Sunrise: 7:33am Sunset: 5:16pm Moonrise: 5:00pm Moonset: 6:47am	☾ 28 Sunrise: 7:34am Sunset: 5:17pm Moonrise: 5:54pm Moonset: 7:31am Full Moon: 4:22am	29 Sunrise: 7:34am Sunset: 5:17pm Moonrise: 6:49pm Moonset: 8:11am
30 Sunrise: 7:34am Sunset: 5:16pm Moonrise: 7:47pm Moonset: 8:49am	31 Sunrise: 7:34am Sunset: 5:19pm Moonrise: 8:45pm Moonset: 9:23am					

Standard/Winter Time for entire month.
Courtesy of www.sunrisesunset.com
Copyright © 2011 Steve Edwards

UPCOMING EVENTS

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 in December, due to the close proximity to the holidays.

Dates for January 2013 events to be announced.



President's Message

By Owen Green

I hope everyone's Thanksgiving was happy and that all of you enjoy the rest of the Holidays. I look forward to 2013 being a good, productive and successful year for our Club.

As you probably know, there will not be either a General Meeting or a Sidewalk event for December due to the upcoming holidays. We will resume those next month, with the dates and times to be announced. I also plan to have a Board meeting in January so that we can get together to discuss any ideas and concerns for the new year.

Our members-only star party on November 14 should be a really good one, with the Geminid Meteor Shower. The peak of this shower is on my wife's birthday, (Happy Birthday Tamarra !!!!) Thursday, Dec. 13 to the early hours of Friday, Dec. 14. On that night you could potentially see about 50 or more per hour. On the night of the 14th, the number of potential meteors dwindles to about half to a quarter as many, but you could still see some really good ones!

We also have an event with TASM coming up in January. On January 5 and 6, this will be a Saturday and Sunday, we are doing "Telescopes 101" again. The event is from 3:00 to 5:00 PM on both days. So we will need Club members to come out and help with this event. Last year we had way more people show up than we expected, so the more of us who come to TASM to help with this, the better.

I look forward to us all having a good year together!

—Owen



Treasurer's and Membership Report

By John Land

Astronomy Club of Tulsa - Treasurer Report by John Land			
The club has 107 members including 32 new memberships this year			
In 2012 - 189 people requested information on the website visitor section			
Newest Members	Kelly davis	Roy Payton	
	Lisa Hoag	Sky Slater	
Expenses	Deposits	Balance	Checking Account
		\$ 1,505.03	Nov 7 Balance
\$ 806.01	\$ 541.00	\$ 1,240.02	Annual Club Dinner
	\$ 221.00	\$ 1,461.02	2013 Calendar sales
\$ 54.40		\$ 1,406.62	2013 Canadian Handbooks
120.21		\$ 1,286.41	Operational Expenses
60.87		\$ 1,225.54	Observatory Repairs
132.85		\$ 1,092.69	Member subscriptions
	837.46	\$ 1,930.15	Membership & Sales
		\$ 1,930.15	Dec 5 Checking Balance
Savings Account		\$ 7,007.03	Dec 5 Savings Balance
Investment Account - End of month	Account Value varies with Market		
\$ 15,682.28	Jan-12	July	\$ 16,506.73
\$ 16,217.08	Mar	August	\$ 16,663.61
\$ 16,240.96	Apr	Sept	\$ 16,888.29
\$ 15,611.46	May	Oct	\$ 16,904.19
June	\$ 16,231.22	Nov	\$ 16,894.58

Telescope Workshop 101

Sat Jan. 5 and Sun Jan. 6 from 3:00 to 5:00 PM

So you got a telescope for Christmas, now what? Tulsa Air & Space Museum (TASM) is here to help!

Bring your telescopes to the planetarium on Saturday, January 5 or Sunday, January 6 from 3-5 pm.

Volunteers from TASM and the Astronomy Club of Tulsa will be available for hands-on instruction and help spark the astronomy bug for this fun and exciting hobby.

This is a Telescope 101 class for first time users and those who need to be reacquainted with the telescope that's been hiding in the closet.

Call 918-834-9900 Ext. 116 to enroll.

Details at <http://www.tulsaairandspacemuseum.org/index.php>





The Secretary's Stuff

By Tamara Green

ASTRONOMY CLUB OF TULSA – MINUTES – DINNER MEETING NOV 16, 2012

PRESENT:

Ann Bruun, President
Tony White, Vice President
Tamara Green, Secretary
John Land, Treasurer
Stan Davis, Board
Tim Davis, Board
Teresa Davis, Board
Tom McDonough, Board
Owen Green, PR/OR/SW

NOT PRESENT:

Catherine Kahbi, Board
Bill Goswick, Board
Christopher Proctor, Facilities Manager
Jennifer Jones, Webmaster

The meeting was held at Tulsa Air and Space Museum. This was our annual Dinner Meeting and Elections.

WELCOME AND INTRODUCTION:

Ann called the meeting to order at 6:50 PM and welcomed all attendees.

PROGRAM:

Dinner, catered by Billy Simms Barbecue, Election of Officers and Board for 2013, Planetarium Show.

There were no officers' reports or departmental reports. The only business was the election of officers and board members for 2013. The following were candidates for Officers and Board Members at Large:

Owen Green, President
Lee Bickle, Vice President
Tamara Green, Secretary
John Land, Treasurer
Stan Davis, Board
Christopher Proctor, Board

The Secretary's Stuff, ct'd.

Michael Blaylock, Board

Tony White, Board

Jody Ray-Fleetwood, Board

Mandy Nothnagel, Board.

We had approximately 55-60 people attend the dinner, and of those, 33 voted. Below are the results:

President – Owen Green

Vice President – Lee Bickle

Secretary – Tamara Green

Treasurer – John Land

Board Members-At-Large:

Stan Davis

Christopher Proctor

Michael Blaylock

Tony White

Jody Ray-Fleetwood

Mandy Nothnagel

Following dinner and elections, everyone assembled for a group photo taken by Tamara Green. Tamara also took a photo of the 2013 Officers and Board. Then we watched a planetarium show.

Following the planetarium show and clean-up, the meeting was adjourned.



Officers and Board-Members-At-Large for 2013, pictured left to right, Tony White, Board; Mandy Nothnagel, Board; John Land, Treasurer; Michael Blaylock, Board; Jody Ray-Fleetwood, Board; Lee Bickle, Vice President; Tamara Green, Secretary; Stan Davis, Board, Owen Green, President. Not pictured: Christopher Proctor, Board.

December - Skies to Stars -The Christmas Star

By Ed Downs – Ed Writes for a national magazine called *"In flight USA"*

The Holiday season offers a huge number of both aviation and astronomical topics to write about. From the aviation standpoint, gift giving is made easy. Pilots will love anything that has to do with their flying activities or cherished flying machine. We are an easy "gift buy" group. Astronomy also has a firm connection with the Christmas season, with the Star of Bethlehem (the Christmas Star) playing a major role in virtually every aspect of Holiday decorations, lore and tradition. The biblical reference in Mathew 2:2 begins our tradition of "the Star in the East" and the holy journey of the three Magi, referred to as "The Three Kings" in late medieval times. It would be hard to imagine the Christmas tradition without this celestial miracle. A quick search in this writer's biblical concordance comes up with no less than 10 references to the stars. And, it must be remembered that many biblical historians believe the Magi were astrologers, skilled in many arts and sciences, having familiarity with the prophecies of Daniel. While today astrology is considered as a completely different subject than astronomy, they were once one and the same, and perhaps the oldest of all scientific understandings by ancient civilizations. Indeed, the stars are an integral part of the Holiday season.

As an amateur astronomer, this writer recalled continuing work being done to try and verify, scientifically, that the Star of Bethlehem existed in a physical sense that can be verified through the science of astronomy and astrophysics. This writer is intrigued by such research and a great fan of biblical archeology, but my research disclosed that I was treading on disputed ground. To millions, the reality that the "Star" was a miracle contained in the Word is absolute proof of its existence. Elements of the Christian faith even disagree as to meaning of the "Star." To challenge faith-based views with physical evidence is, in fact, insulting and upsetting. It is not the intent of this writer to do either. But, as a Christian with a telescope, this writer cannot help but look to the heavens in admiration of a God that created everything in an instant. Astrophysicists know this as the "singularity" while we common folk think in terms of the "Big Bang."

Those who search for the Star of Bethlehem run into a variety of challenges. The calendar, as we know it, did not exist, and competing calendars flourished. The precise historical birthday of Jesus is not known. Our current celebration was established centuries after the Crucifixion. Astronomers (astrologers?) of the time did not have hard drives into which data could be stored, and scientific records that might have existed were destroyed when the remarkable documents contained in the Library of Alexandria were lost through a series of devastating wars covering a period of nearly 600 years. But, today's computers can roll back time. We can see that the time of Christ's birth did contain some unusual conjunctions of planets, especially between Jupiter and Venus, meaning they were so close together that they may well have appeared as a single, new, bright "Star." This conjunction would have appeared in the constellation Leo, known as the "Lion of Judah," long associated with the coming of a King. A passing comet could certainly have been viewed as the "Star" and may have seemed to have stayed in one position, but comets were traditionally viewed during ancient times as "the coming of bad things" and not likely to be associated with such a holy event. Additionally, records that do exist make no mentions of a comet, something that would have "made the 10:00 news" of the day.

It is interesting to note that Chinese records (avid and skilled astronomers) of the time do speak of a sudden bright light in the sky that lasted for months. This could well have been a supernova, the sudden and explosive death of a star. A supernova occurs when a star's central thermonuclear core burns out, or runs out of

December - Skies to Stars -The Christmas Star, by Ed Downs, Ct'd.

fuel. The core shuts down suddenly and the enormous mass of the star collapses in on itself. The unimaginable heat and energy caused by this collapse creates an enormous explosion that is billions of times brighter than our own sun. This would most certainly have been observed in all parts of the ancient world and recorded. But only Chinese accounts survive. One might think that the explosive death of a star is hardly a good omen for the birth of a Savior, but think again. The death of a star is actually a birth! The heat and energy expelled by a single supernova causes massive molecular changes to occur within its own atomic structure, creating every known chemical element. These elements are cast out into the universe as building blocks for new stars, planets and life forms, like us.

Speculation persists, but for this amateur astronomer, a look through my telescope is all that is needed to fire up the imagination. Imagine you are standing on the shore of the Sea of Galilee, looking into the night skies with a powerful telescope. Your view falls upon a beautiful open star cluster known as M22, 2000 light years from earth. With thousands of stars huddled together by gravity, it is now known that at least some of those stars will have planets, and one of those planets might have an advanced life form that is looking back at you at that very moment. But you would not see them looking back, because the light from that planet took 2000 years to reach you, so you would see their living history, in real time. And they would not see you, but would see our planet's living history as it was 2000 years ago. Our M22 friends might see a big gathering on the shores of a lake, with a man in a robe serving fish and bread, followed by a speech from a mount. They would see this in real, living, time. And imagine, He was the only one in that crowd that knew we would be celebrating His birthday, over 2000 years later. **Happy birthday, Jesus.**

Just a bit of added information to Ed's article by John Land

The Star of Bethlehem is a popular topic at planetarium shows this time of year. One to the best articles on the subject I have read is a Dec 1996 article from Hillsdale College newsletter Imprimis

http://www.hillsdale.edu/hctools/ImprimisTool/archives/1996_12_Imprimis.pdf

The depiction of the Christmas star as having a long tail does perhaps have an astronomical link. Early [Italian Renaissance painter Giotto di Bondone](#) in his painting [Adoration of the Magi](#). Painted the star of his nativity scene with a long tailed comet. He had observed Halley's Comet in 1301 and was inspired to depict it as the star of Bethlehem. The European spacecraft Giotto flew within 370 miles of Comet Halley's nucleus in March 1986 [http://en.wikipedia.org/wiki/Giotto_\(spacecraft\)](http://en.wikipedia.org/wiki/Giotto_(spacecraft))

Some interesting planetary alignments as seen from Jerusalem

On the evening of June 17, 2 BC Venus and Jupiter were within 9 arcsecs (1/400) of a degree apart. So close it would have been impossible to tell them apart without a telescope. And firmly in the center of Leo – a constellation associated with royalty. There are several biblical references to The Lion of Judah.

They returned to a close conjunction on Oct 14 in the morning sky about 1.5 degrees apart, followed by another even closer conjunction on evenings of Aug 20 and 21, 1 BC ½ degree each other. During the day on the on Aug 20 they passed within 1/10 of a degree of each other.

Jupiter and the star Regulus in Leo went through a series of 3 conjunctions. On Sept 14, 3 BC Jup. & Reg. at dawn. Feb 17, 2 BC Jup – Reg – Full moon within 1.5 deg at dawn – May 9, 2 BC Jup – Reg – Crescent moon

Evening. (**Note: Dates are in our present calendar system. The Julian Calendar used at the time is 13 days off from our present [Gregorian Calendar](#)**)

Personally I don't think a planetary alignment explains what the "Wisemen" saw. The planets were well know by many cultures including Jewish. The Jewish faith does not worship the celestial objects such as the sun or stars as was common in some other cultures. Therefore the Bible has only a few celestial references to constellations of Orion, Pleiades, Bear and Twins. Whatever they saw it was likely something that a person well versed on the night sky might have seen as significant. Much like many discoveries of Nova and Comets are made by vigilant observers today. By John Land



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.

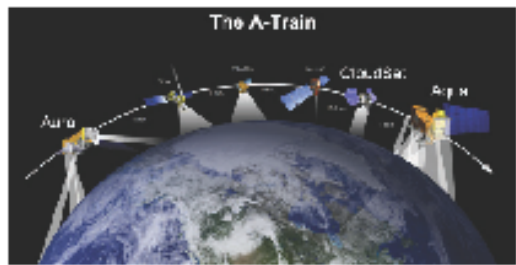
Space Place en español

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, with toggles to the English on every page.



Spotlight on . . .



"Missions to Planet Earth" is an on-line 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.

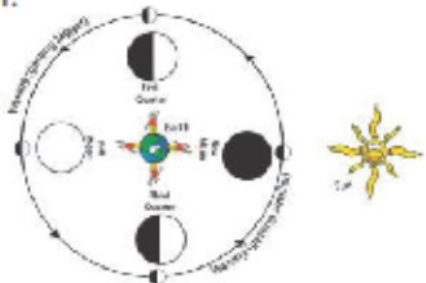
For the classroom



"Voyage on the High Seas: A Jason I Ocean Adventure" is a real board game. Go to spaceplace.nasa.gov/posters/high_seas 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 1st or 3rd 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.



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.

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. 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.

Dec. 14: Geminids Meteor Shower

Get tips on the best meteor viewing techniques at 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.



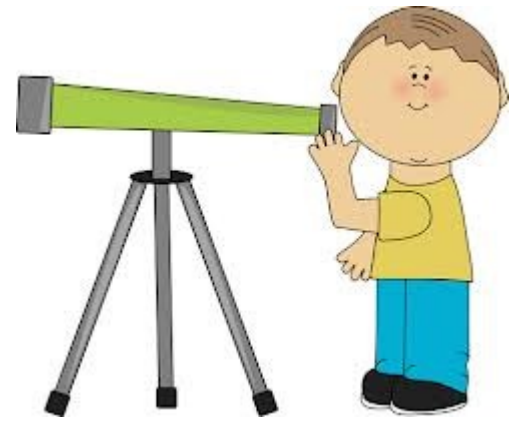
Dec. 31, 1705: First recorded sighting of Halley's comet.

Play Comet Quest and learn about comets at 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.





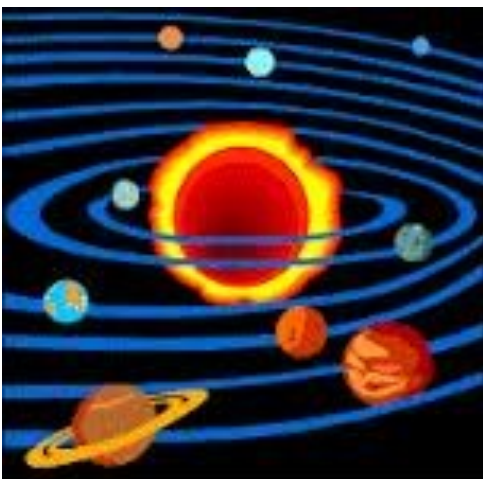
More fun stuff for the young astronomers!

Check out these webpages!

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

<http://scijinks.gov>

<http://spaceplace.nasa.gov>



HELP NEEDED!

Elysa Corin

Research Assistant

and

Dr. Gail Jones

Professor

Science, Technology, Education, and Mathematics Education Department

North Carolina State University

ced_stemhobby@ncsu.edu

Present the following opportunity to those who are interested:

Are you a science hobbyist?

We need your help with a new National Science Foundation sponsored research study that will investigate the characteristics and educational experiences of people who are active in science hobbies. More and more people are engaging in science hobbies; schools and science centers would like to know more about the characteristics of science hobbyists and how these organizations might better support hobbyists' networking and education.

What will happen if you take part in the study?

The information gained from this research can help science educators and researchers understand how to better teach science in schools and museums, and how to design better community-based science programs. Participation in this study is voluntary. Information you provide will be anonymous. If you complete the survey, you may elect to enter a drawing for a \$100 Target gift card.

Please read the consent letter below and when you are ready to complete the survey click on this link

Survey Link: http://ncsu.qualtrics.com//SE/?SID=SV_700sR9G0Pkp5I2N

More Information on next page.

Hobbyist Survey
North Carolina State University

You are being asked to take part in a research study. Your participation in this study is voluntary. You have the right to be a part of this study, to choose not to participate or to stop participating at any time without penalty. The purpose of research studies is to gain a better understanding of a certain topic or issue. You are not guaranteed any personal benefits from being in a study. Research studies also may pose risks to those that participate. In this consent form you will find specific details about the research in which you are being asked to participate. If you do not understand something in this form it is your right to ask the researcher for clarification or more information. If at any time you have questions about your participation, do not hesitate to contact the researcher- Dr. Gail Jones.

What is the purpose of this study?

The purpose of this letter is to invite you to participate in a research study “Science Hobbyists” designed to investigate characteristics and educational experiences of people who are active in science hobbies. More and more people are engaging in science hobbies and schools and science centers would like to know more about characteristics of science hobbyists and how organizations might better support hobbyists’ networking and education. Hobbyists can be a wonderful asset to communities and support for science across the county

What will happen if you take part in the study?

If you agree to participate in this study, you will be asked to complete a survey at a time and location convenient for you. The survey would take about 30 minutes to complete.

Participation is entirely voluntary and a decision whether or not to participate will in no way impact your life or your hobby. No names of participants will be used in this study. All information gathered during this study will be used only for this research study and only the researchers will have access to the data. No identifying information will be used during any of the data reporting. The information gained from this research can help science educators and researchers understand how to better teach science in schools and museums and how to design better community-based science programs.

Risks

There are no known risks in participating in this study.

Benefits

The only benefit to you as a participant is being able to help researchers better understand and support science hobbyists and possibly gain insight into how to better teach science in schools and museums and design better community-based science programs.

Confidentiality

The information in the study records will be kept confidential to the full extent allowed by law. Data will be stored securely in a locked file cabinet in a locked office. No reference will be made in oral or written reports which could link you to the study. You will NOT be asked to write your name on any study materials so that no one can match your identity to the answers that you provide.

Compensation

For participating in this study you will be in a drawing for a \$100 Target gift card. If you decide to participate in the drawing you will need to list your email contact information. However, your contact information will be separated from your responses to the survey so that your individual answers will not be identifiable.

What if you have questions about this study?

If you have questions at any time about the study or the procedures, you may contact the researcher, *Dr. Gail Jones, at NCSU, Box 7801, Raleigh, NC 27695-7801, or 919-515-4053*

What if you have questions about your rights as a research participant?

If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact Deb Paxton, Regulatory Compliance Administrator, Box 7514, NCSU Campus (919/515-4514).

Consent To Participate

"I have read and understand the above information. I agree to participate in this study with the understanding that I may choose not to participate or to stop participating at any time without penalty or loss of benefits to which I am otherwise entitled." Once you click on the link to the survey you are indicating your willingness to participate in the study.

To begin the survey click on this link:

http://ncsu.qualtrics.com//SE/?SID=SV_700sR9G0Pkp5I2N

Where We Meet:

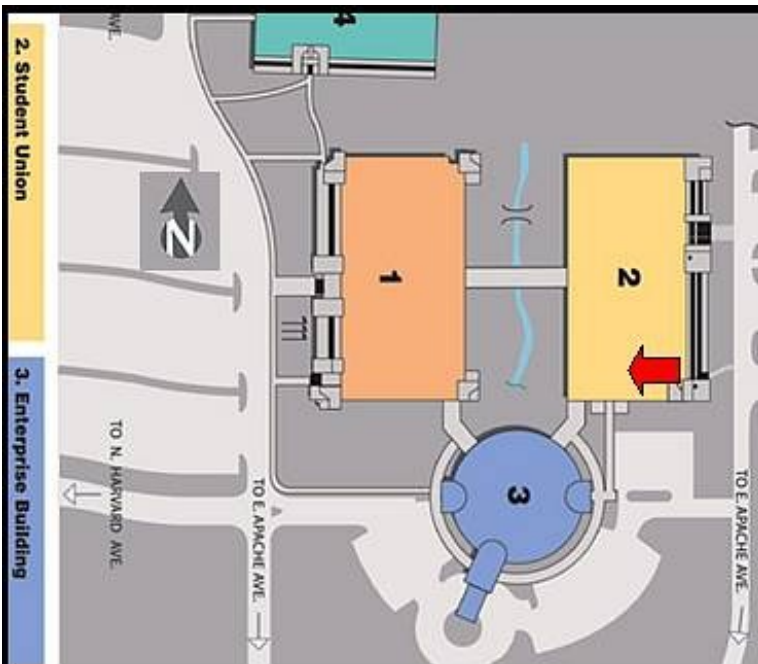
TCC Northeast Campus, 3727 E. Apache St., Student Union Bldg. 2, Room 1603

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 Holidays.

CLUB OFFICERS

PRESIDENT	OWEN GREEN 918-851-8171
VICE PRESIDENT	LEE BICKLE 918-872-8744
SECRETARY	TAMARA GREEN 918-851-1213
TREASURER	JOHN LAND 918-695-3195

BOARD MEMBERS AT LARGE

STAN DAVIS	stan.home@cox.net
MICHAEL BLAYLOCK	quaga53@cox.net
MANDY NOTHNAGEL	sleepinallday@gmail.com
CHRISTOPHER PROCTOR	act_maint@astrotulsa.com
JODY RAY-FLEETWOOD	oubre70@yahoo.com
TONY WHITE	tony@astrotulsa.com

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 2013 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

Sky & Telescope is \$33 per year.

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>





*Wishing you and yours a very happy
Holiday Season!
See you in 2013!*

From Your Editor



THE ASTRONOMY CLUB OF TULSA INVITES YOU TO

MAKE PLANS THIS WINTER TO JOIN US AT AN ASTRONOMY CLUB OF TULSA STAR PARTY!

OPEN TO THE PUBLIC

For more information please visit www.astrotulsa.com.



The Observer is a publication by the Astronomy Club of Tulsa. The Astronomy Club of Tulsa is a 501C 3 non-profit organization open to the public. The Club started in 1937 with the single mission to bring the joy and knowledge of astronomy to the community of Tulsa, OK and the surrounding area. Today our mission remains exactly the same. We travel to local schools, churches and many other venues with scopes and people to teach. Our observatory is located in Mounds and many public programs are offered there. To join the Astronomy Club of Tulsa please visit www.astrotulsa.com where you will find all the information necessary to become a member.

