



Astronomy Club of Tulsa

Observer

October 2014



Photo: A View Through a Tree of an Eclipsed Moon, Total Lunar Eclipse Oct. 8, 2014, by Tamara Green.






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OCTOBER 2014

SUN	MON	TUE	WED	THU	FRI	SAT
			1 	2	3	4
5	6	7	8 	9	10	11
12	13	14	15 	16	17	18
19	20	21	22	23 	24	25
26	27	28	29	30 	31	

NOVEMBER 2014

SUN	MON	TUE	WED	THU	FRI	SAT
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30						

UPCOMING EVENTS:

General Meeting	Fri, Oct 3	Jenks HS Planetarium	7:00 PM
Sidewalk Astronomy	Sat, Oct 4	Bass Pro	8:00 PM
Public Star Party	Sat, Oct 18	ACT Observatory	7:00 PM
Solar Eclipse Viewing	Thurs, Oct 23	Jenks HS Planetarium	4:30 PM
Members' Night	Fri, Oct 24	ACT Observatory	7:00 PM
Back-Up Night	Sat, Oct 25	ACT Observatory	7:00 PM
Halloween	Fri, Oct 31		
Dinner Meeting	Fri, Nov 7	TASM Planetarium	6:30 PM

(Please Note: This event is for Club members and their families only please.)

Sidewalk Astronomy	Sat, Nov 8	Bass Pro	6:00 PM
Public Star Party	Sat, Nov 15	ACT Observatory	7:00 PM
Members' Night	Fri, Nov 21	ACT Observatory	7:00 PM
Back-Up Night	Sat, Nov 22	ACT Observatory	7:00 PM
Thanksgiving Day	Thurs, Nov 27		



SPECIAL ASTRO ALERT!!!!

PARTIAL SOLAR ECLIPSE!!!

**SPECIAL VIEWING EVENT AT JENKS
HIGH SCHOOL PLANETARIUM**



**105 E. B ST., JENKS, OK. Doors open at
4:30 PM.**

(For directions and maps, please see the "Where We Meet" section on Page 25 of this newsletter.)

Thursday, October 23, 2014



Partial Eclipse begins at 4:42 PM, when the Moon's shadow touches the Sun's edge.

Maximum will be at 5:49 PM, when the Moon's shadow is closest to the center of the Sun.

Sunset will be at 6:36 PM, before the Eclipse ends, unfortunately.

Partial Eclipse ends at 6:49 PM. Sun will be below the horizon.

On the afternoon of October 23rd, most of Canada, the United States and Mexico will be treated to this spectacular event! Members of our Club will be at the Jenks High School Planetarium with solar telescopes and telescopes with solar filters to show the sun safely to Club members and guests. This event is open to the public.

Any Club member wishing to volunteer to help with this event please contact a club officer, all of whom are listed on Page 27 of this newsletter.

We hope to see you there!

AN IMPORTANT ANNOUNCEMENT!!

It's almost time for the election of Officers and Board Members-At-Large for next year!

Elections will take place at the Annual Dinner Meeting, which will be on Friday, November 7, 2014 at the Tulsa Air and Space Museum Planetarium. Festivities will begin at 6:30 PM (please see flyer on next page).

So far, those who are running are as follows:

Richard Brady for President

The Office of Vice President is open

Tamara Green for Secretary

Tim Davis for Treasurer

Mandy Nothnagel for Board

Skip Whitehurst for Board

If you are interested in an Office or a Board position, or would like to nominate someone, please contact Secretary Tamara Green at astronomer.misstamara@yahoo.com and she will put your name (or your nominee's name) on the ballot.

PLEASE HAVE YOUR NAME OR NOMINEE'S NAME AND THE OFFICE OR BOARD POSITION THAT YOU OR YOUR NOMINEE ARE INTERESTED IN TO TAMARA BY NO LATER THAN SATURDAY, NOVEMBER 1 SO SHE CAN HAVE THE BALLOT COMPLETED AND READY TO PRINT. Thank You!

The Astronomy Club of Tulsa Welcomes All Members and their Families to Our

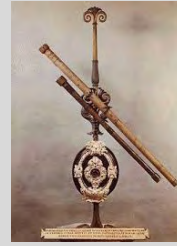
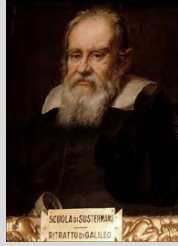
ANNUAL DINNER MEETING

Friday, November 7, 2014

6:30 PM

Tulsa Air and Space Museum Planetarium

Cost will be \$12 per person. Please RSVP with Treasurer Tim Davis



Festivities will include:

ELECTION OF OFFICERS AND BOARD MEMBERS-AT-LARGE FOR 2015

A fun Italian theme (much like last year's Greek theme), with presentations on Italian contributions to Astronomy and wonderful catered food! (Caterer To Be Announced)

A Silent Auction

Group Photo

And More!

We hope to see you there!



Take the Future of Amateur Astronomers Survey



The Night Sky Network is doing a new survey of amateur astronomers located in the United States. We are attempting to understand the landscape of educational outreach performed by astronomy clubs and assess the needs of the amateur astronomy community for the next 5 years. We want to hear your voice. Please let us know what your needs are and how we can better help you and your clubs by taking our survey, located here:

<http://bit.ly/2014astrosurvey>

Pass this announcement along to any other persons or organizations that would have an interest in this survey as well. Thank you all!



October 4 - Astronomy Day Part 2. Astronomy Day is an annual event intended to provide a means of interaction between the general public and various astronomy enthusiasts, groups and professionals. The theme of Astronomy Day is "Bringing Astronomy to the People," and on this day astronomy and stargazing clubs and other organizations around the world will plan special events. You can find out about special local events by contacting your local astronomy club or planetarium. You can also find more about Astronomy Day by checking the Web site for the [Astronomical League](#).



President's Message

By Mandy Nothnagel

Hello, everyone!

Can you believe another year has already passed? It's already time for the Annual Banquet! I am sure you will love what we have planned! This year's theme is Italy- we will be spotlighting Italy's contribution's to astronomy and cater in some delicious Italian food. As we did last year, we will also have the silent auction, officer elections, and discuss this year's achievements. If you have anything you would like to donate for the silent auction or information to contribute about Italy's contributions to Astronomy, we would greatly appreciate it! Please contact me at ACTGroupScheduling@gmail.com and we can make arrangements.

Because I have been so busy with the last few months (I really thought I would be be so much less busy after graduation!), I have not yet decided as to whether I will run for president again next year. I want to make sure that if I do run again, I am able to give the Club and position the attention they deserve. I have truly enjoyed working with everyone on the Board and in the club. Even if I decide not to run, I will definitely stay involved and on the Board. You guys can't get rid of me that easily!

Finally, I want to thank everyone for their support and all of their help over the last year, especially our Vice President, Richard Brady, the Board, and all of our faithful and reliable volunteers. It's all of you that make this club continue and thrive year after year!

I hope everyone has enjoyed our events and activities this year and that you continue to enjoy them next year! As always, we have great plans in the works!

Have a safe, happy, clear-skied Halloween!

Mandy Nothnagel

Astronomy Club of Tulsa President, 2014

ACTPres@astrotulsa.com



Treasurer's and Membership Report

By Tim Davis

Astronomy Club of Tulsa: 135 members, including 48 new members in 2014.

Welcome to our new members this month: Norm Hughes, Dan Zielinski, Wayne Cates and Jerry Cassity.

Club Accounts as of Oct 12, 2014:

Checking: \$3,236.33; Savings: \$3,771.90; Investment accounts: \$18,523.62 (Value Fluctuates with Market); PayPal: \$0.00



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 now. 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 2014 are as follows:

Adults: \$45.00 per year, includes Astronomical League Membership.

Sr. Adult: \$35.00 per year for those 65 or older, includes Astro League Membership.

Students: \$30.00 with League membership; **Students: \$25.00** without League membership.

Additional Family membership: \$20.00 with voting rights and League membership; **\$15.00** 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 \$34.00 for 1 year, or \$60.00 for 2 years. www.astronomy.com To get the club discount you must go through the club group rate.

Sky & Telescope is \$33.00 per year. 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.

Treasurer's and Membership Report, by Tim Davis, Ct'd.

The **Annual Astronomy Club Dinner** will be held at Tulsa Air & Space Museum, Friday Nov 7 starting at 6:30 PM.

Tickets are \$12.00 per person.

Spouses and Family of members welcome.

Please RSVP before Nov 3 so we can get a head count.

Go to <http://astrotulsa.com/Contact.aspx>, Click on Treasurer. In the comments section specify the number of people attending counting yourself.

2015 Wall Calendar

The 2015 Astronomy Magazine Wall Calendars are here and are now available. If you would like to reserve one, send me an email at act_tres@astrotulsa.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. We have 50 available this year for \$10.00 each, cash, check or credit cards accepted. That is a 23% savings off the regular retail price.



Get yours while they last!

Tim Davis

ACT Treasurer



The Secretary's Stuff

By Tamara Green

ASTRONOMY CLUB OF TULSA—GENERAL MEETING—FRIDAY, OCTOBER 3, 2014

JENKS HIGH SCHOOL PLANETARIUM

PRESENT:

Richard Brady, VP

Tamara Green, Secretary

Stan Davis, Board

Skip Whitehurst, Board

John Land, Board

NOT PRESENT:

Mandy Nothnagel, President

Tim Davis, Treasurer

Christopher Proctor, Board

Lee Bickle, Board

Michael Blaylock, Board

James Taggart, Board

Program: Club members' pictures from Okie-Tex Star Party 2014

VP Richard called the meeting to order at 7:11 PM and welcomed members and guests.

He then discussed upcoming events, including the Annual Dinner Meeting at TASM, which will be on Friday, November 7 at 6:30 PM. After that, he announced that the Club has a chance to be Beta testers for the Jenks HS Planetarium programs, called "Compass Calendar Clock". It will be on Friday, December 7 at 7:00 PM. Richard then turned the floor over to Tamara, who gave a presentation on her Okie-Tex pictures.

Following Tamara's presentation, new members Roger and Anna shared their OTSP pictures.

Following that, John discussed the upcoming eclipses this month. The total lunar eclipse on Tuesday, October 8 begins at 4:15 AM, totality at 5:25 AM, totality ends at 6:24 AM. The partial solar eclipse on Thursday, October 23 begins at 4:43 PM, ends 6:49 PM. Maximum will be at 5:43 PM and sunset will be at 6:35 PM.

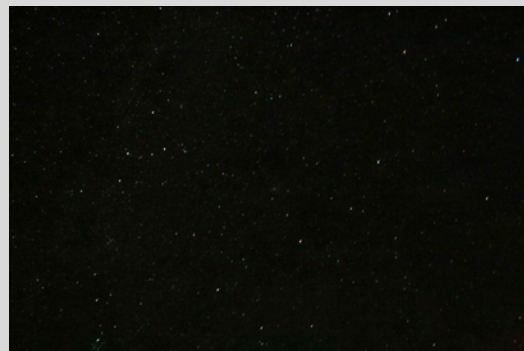
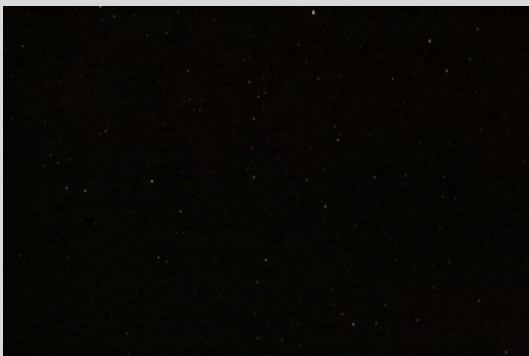
No other officers or staff reports were given.

Richard adjourned the meeting.

Photos Of Some Fun Stuff

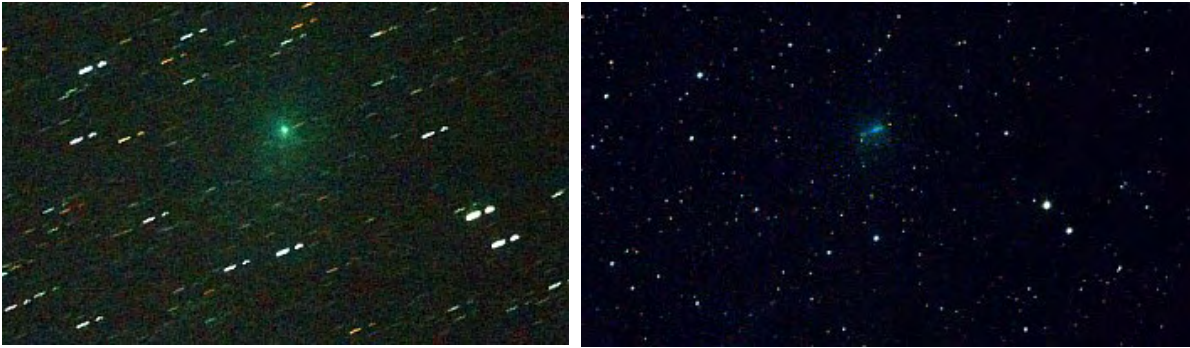
by Tamara Green

For your viewing pleasure, here are a few photos that I took at Okie-Tex and of the Lunar Eclipse! For the whole Photoset, see the Club's Facebook page!



Submitted by John Land:

These images were taken by a former club president, Frank Newby, from his suburban home in east Broken Arrow, using an 8 inch f 3.9 Astrograph.



Comet Jacques C-2014 E2 Taken on 9-18-14

Comet Jacques was easily visible throughout August to Mid-September. For several weeks it swept over the Earth's northern sky from Cassiopeia through Cygnus and into Vulpecula.

On the 18th it was a couple of degrees north of the "Coat hanger" asterism.

This was a series of 12 shots but only 11 were usable. Each shot was 30 sec. @ ISO 800 on a Canon T3i unmodified. The first shot started 9-18-14 at 9:57:49 pm and the last was 9-18-14 at 10:15:59. Total exposure time was 5min. 30 sec. Because each shot was 30 sec. I've got 30 sec. worth of coma movement relative to the stars for each exposure with a total movement of 18 min. 10 sec. for the duration of the shots.

They were shot in RAW format at a resolution of 5184 x 3456 thru an 8 inch f 3.9 astrograph using a parrcor 2 corrector with a broadband filter (Light pollution) which gave it a focal ratio of f 4.5. This gives my FOV at just a little over 1 degree.

Software - Canon DPP (Digital Photo Professional), Photoshop CS2 version 9, ImagePlus version 5.01.



Pumpkin Nebula

Enlarged view

A good image for Halloween. NGC6818 (looks like a pumpkin).

Planetary only 15 arc sec. across. About 1/3 the apparent size of Jupiter

Conserving Dark Skies in New Mexico

by Brad Young

This article is meant to toot my project team's horn a little bit. I designed and was the project manager for the little facility you see behind the sign to the Chaco Canyon historical Park. To quote the NPS website:

“The park's natural nighttime darkness, commitment to reducing light pollution, and ongoing public outreach have (sic) led to its certification as an International Dark Sky Park by the [International Dark-Sky Association \(IDA\)](#). Chaco is the fourth unit in the National Park System to earn this distinction. By receiving this designation at the Gold-tier level, Chaco rates as one of the best places in the country to experience and enjoy natural darkness.”

When I first began working in this area in December, we were unable to pipe our associated natural gas from oil production to market, due to the lack of infrastructure in the area. Since then we have been working tirelessly to get our flares put out and get the gas to market for a number of reasons. For our hobby, the biggest problem is the illumination caused by the flares burning night. With an IDA site nearby, I took it as a personal matter to get the job done. I'm happy to report that all of our flares have been extinguished.



As things continue to grow there, we've added four more sites similar to this, and I will be visiting the area to kickoff construction of an oil delivery facility right after Okie-Tex to lessen the truck traffic. Of course, there will be times when we still have to flare occasionally for short periods. And of course we are not the only operator in the area. But it's nice to know that what I do for a living is contributing to the conservation of another precious resource, our dark sky at night.

Conserving Dark Skies in New Mexico, by Brad Young, Ct'd.

If you are out in the Four Corners area, on vacation, as an extension of a trip to Okie-Tex, or for any reason, go see this fascinating site [during the day for an example of our Native American culture](#). Then, stick around for the dark skies at night in the designated area (be sure and tell the ranger), or visit during one of the outreach nights put on by the Albuquerque Astronomical Society (TAAS). See <http://www.nps.gov/chcu/planyourvisit/nightsky.htm> for more details.

Note: all pictures in article by me, much better ones at the website.



The great kiva in the plaza of Chetro Ketl

QUESTIONS: As always, questions and comments are welcome!

tom hoffelder

rocksnstars@gmail.com

Come with me now, Pilgrim of the stars,

For our time is upon us and our eyes

Shall see the far country

And the shining cities of infinity ~ Robert Burnham, Jr.

C/2013
A1 vs
MARS

		NORWAY, MAINE					YEEHAW JUNCTION, FL				
DATE	ENT	MARS	COMET	SEP	ALT	ENT	MARS	COMET	SEP	ALT	
18	18:56	17 35.8 -24 50	17 37.7 - 25 19	26' E 29' S	13°	19:43	17 35.9 -24 51	17 37.7 - 25 18	24' E 27' S	25°	
19	18:55	17 39.0 -24 52	17 37.6 - 24 44	19' W 08' N	13°	19:42	17 39.1 -24 52	17 37.6 - 24 43	20' W 09' N	25°	
20	18:53	17 42.2 -24 54	17 37.5 - 24 10	64' W 44' N	13°	19:41	17 42.3 -24 54	17 37.5 - 24 09	66' W 45' N	25°	

		TULSA, OK					BOULDER CITY, NV				
DATE	ENT	MARS	COMET	SEP	ALT	ENT	MARS	COMET	SEP	ALT	
18	19:40	17 36.0 -24 51	17 37.7 - 25 17	23' E 26' S	19°	18:55	17 36.2 -24 51	17 37.7 - 25 15	20' E 24' S	20°	
19	19:39	17 39.2 -24 52	17 37.6 - 24 42	22' W 10' N	19°	18:54	17 39.4 -24 52	17 37.5 - 24 40	26' W 12' N	20°	
20	19:37	17 42.4 -24 54	17 37.5 - 24 07	67' N 47' W	19°	18:53	17 42.6 -24 54	17 37.5 - 24 05	70' W 49' N	20°	

10/17			(10/18)			10/24			
SS	CTE	NTE	ATE	MR	SS	CTE	NTE	ATE	MS
17:55	18:24	18:58	19:31	01:46	17:44	18:13	18:47	19:21	18:20

Object (Type)	RA	Dec	Star	N/S	E/W	Mag*/(# of Stars)	Size (")/ Sep (")	Spect/ M# or H#	Dist (ly)	Urano I Page	Comment [B-V] {current mag} (opt x)
RX Peg (CS)	21 56.4	+22 52	ι Peg	2.5 S	2.4 W	8.0-9.5		Cme		166	{9.2} [3.0]
VX And (CS)	00 19.9	+44 43	θ And	5.0 N	0.4 E	8.0-9.5		C		59	{8.6} [4.4]
41 Aqr (MS)	22 14.3	-21 04	ι Aqr	7.2 S	1.8 E	6, 7.5	5.0	K0, F8		347	(150)
8 Lac* (MS)	22 35.9	+39 38	η Peg	9.4 N	1.3 W	6,6.5,10, 9	23,48,8 1	B1, B2		87	(35)
δ Cep (MS)	22 29.2	+58 25	-	-	-	4, 6.5	41	F5, B7	900	57	(20)
Krg60 (MS)	22 28.0	+57 42	prv	0.7 S	0.1 W	10, 11.5	2.4	dM3, dM4	13	57	(320)
O Σ 485 (MS)	23 03.0	+55 15	δ Cep	3.2 S	4.8 E	6, 9, 9.5	20, 57			58 ni	(40)
NGC 7293* (PN)	22 29.6	-20 50	δ Aqr	5.0 S	5.8 W	7.3	17	-	600	347	Helix
NGC 7654* (OC)	23 24.8	+61 36	β Cas	2.4 N	5.1 W	(120)	16	M52	3800	15	
NGC 7662 (PN)	23 25.9	+42 32	ι And	0.7 S	3.2 W	8.3	0.6	*H18-4	1800	88	
NGC 7686* (OC)	23 30.1	+49 08	λ And	2.6 N	1.2 W	(35)	15	*H69-8	5500	88	
NGC 7789* (OC)	23 57.4	+56 43	β Cas	2.4 S	1.6 W	(200)	25	*H30-6	13 K	35	

NGC 7790* (OC)	23 58.4	+61 13	β Cas	2.0 N	1.4 W	(25)	5.0	*H56-7	9000	35	OC 7788 0.3 NE
NGC 129* (OC)	00 30.0	+60 13	β Cas	1.1 N	2.6 E	(50)	12	*H79-8	6500	35	
NGC 136 (OC)	00 31.5	+61 31	priv	1.3 N	0.2 E	(10)	1.5	*H35-6	27 K	36	
NGC 185* (E3)	00 39.0	+48 20	ζ Cas	5.5 S	0.3 E	[13.7]	8.0X7.0	*H707-2	2.1 M	60	M31 satellite
NGC 224 (Sb)	00 42.7	+41 16	μ And	2.8 N	2.6 W		3°X1°	M31	2.5 M	60	Andromeda
NGC 221 (E2)	00 42.7	+40 52	priv	0.4 S	-	[12.5]	8.5X6.5	M32	2.5 M	60	
NGC 205 (E5)	00 40.4	+41 41	priv	0.8 N	0.4 W	[13.8]	19X11	M110	2.6 M	60	*H18-5
NGC 225* (OC)	00 43.6	+61 47	γ Cas	1.1 N	1.7 W	(20)	15	*H78-8	1700	16	
NGC 381* (OC)	01 08.3	+61 35	γ Cas	0.9 N	1.4 E	(30)	7.0	*H64-8	9000	16	
NGC 404* (E-S0)	01 09.4	+35 45	β And	0.1 N	-	[12.8]	3.5	*H224-2	11.4 M	91	
NGC 581 (OC)	01 33.4	+60 39	δ Cas	0.5 N	0.9 E	(60)	6.0	M103	3700	37	
NGC 598 (Sc)	01 33.9	+30 39	α Tri	1.1 N	4.2 W		69X41	M33	2.8 M	91	*H17-5
NGC 628* (Sc)	01 36.7	+15 47	η Psc	0.4 N	1.4 E	[13.9]	10	M74	30 M	173	
NGC 637 (OC)	01.43.1	+64 02	ε Cas	0.4 N	1.4 W	(20)	3.0	*H49-7	4500	16	
NGC 651 (PN)	01 42.4	+51 35	φ Per	0.9 N	0.2 W	10.1	1.1	M76	8200	37	Little Dumbell, *H193-1
NGC 654 (OC)	01 44.0	+61 53	ε Cas	1.8 S	1.2 W	(50)	6.0	*H46-6	3800	16	
NGC 752 (OC)	01 57.7	+37 47	γ And	4.7 S	1.2 W	(70)	75	*H32-7	3400	92	

*DSS image

*[Surf
Brtnss
for GX's]

ni=shown but

*H400

not
identi-
fied

mag per
square
arcmin

Where does the sun's energy come from?

National Aeronautics and
Space Administration



Every 1.5 millionths of a second, the sun releases more energy than all humans consume in an entire year. Its heat influences the environments of all the planets, dwarf planets, moons, asteroids, and comets in our solar system.

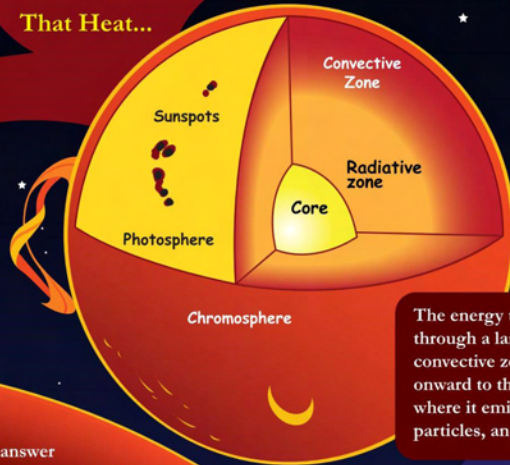
And that light travels far out into the cosmos—just one star among billions and billions.

Create a 'solar wind' that pushes against the fabric of interstellar space billions of miles away.

Allows gases and liquids to exist on many planets and moons, and causes icy comets to form fiery halos.

Powers the chemical reactions that make life possible on Earth.

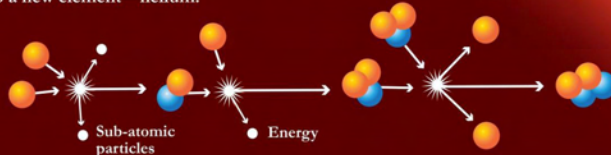
That Heat...



The energy travels outward through a large area called the convective zone. Then it travels onward to the photosphere, where it emits heat, charged particles, and light.

How does a big ball of hydrogen create all that heat? The short answer is that it is big. If it were smaller, it would be just be a sphere of hydrogen, like Jupiter. But the sun is much bigger than Jupiter. It would take 433,333 Jupiters to fill it up!

That's a lot of hydrogen. That means it's held together by a whole lot of gravity. And THAT means there is a whole lot of pressure inside of it. There is so much pressure that the hydrogen atoms collide with enough force that they literally meld into a new element—helium.



Nuclear Fusion

This process—called nuclear fusion—releases energy while creating a chain reaction that allows it to occur over and over and over again. That energy builds up. It gets as hot as 15 million degrees Fahrenheit in the sun's core.



For a really cool animation that goes with the proceeding poster, follow this link:

<http://spaceplace.nasa.gov/sun-heat>

Below is a link for another Space Place article, called “Why Did It Take So Long to Discover Uranus?”

<http://spaceplace.nasa.gov/uranus>

For something really amazing and fun, below is a link to their 3-D Image Gallery!

<http://spaceplace.nasa.gov/3d-gallery>





the Space Place

Sept – October 2014 / Vol. 7, Issue 4

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.

It's that time again—the beginning of a new school year! Here at the Space Place, we know that it can be a stressful time for educators. That's why we think it's a great idea to remind you of all the helpful resources we have developed specifically for you. Want material presented in visual, written, and animated formats for reading exercises in line with the Common Core? Look no further than our new "Space Place in a Snap" series. Want a handy way to provide Space Place activities to all your students even if they don't have a computer? We've made all of them available in PDF! Struggling to come up with material relevant to the Next Generation Science Standards? Check out our helpful NGSS search feature in the educators' section. While you are there, be sure to check out all the other great resources we provide.

What's New? Jupiter!

From massive planets, long distances, and extreme forces, it's a challenge for educators—let alone students—to fully grasp the sizes and scales behind astronomical and planetary science. The Space Place grapples with just this issue in one of its latest additions—a new article titled "What's it like inside Jupiter?" Building up from the pressure you might feel at the bottom of a pool all the way to the pressure felt in Jupiter's core, this article uses mid-size sedans as its primary unit of measurement. It comes with a fun animation too. Check it out at <http://spaceplace.nasa.gov/jupiter>.



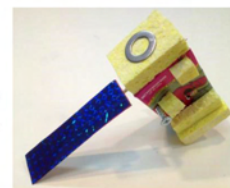
What's New? Tectonics 'Snap!'



We've got a new release in our popular series "Space Place in a Snap." This time the combined poster and animation presentation tackles the concepts behind plate tectonics and the shifting nature of Earth's crust. This is a great resource for any Earth science curriculum. Check it out at <http://spaceplace.nasa.gov/tectonics-snap>.

Spotlight on Activities

With the arrival of the new school year, it's a good time to remember that our popular make-and-do activities are now available to download as easy-to-hand-out, ready-to-print PDF files. Perfect for the classroom or afterschool programs, these activities are a great way to bring the Space Place to all your students even if there are a limited number of computers or Internet connections. Check out popular activities like "Build your own spacecraft," "Make Oreo Moon phases," and "Get your gummy greenhouse gases." The downloads are sorted by topic and can be found at <http://spaceplace.nasa.gov/make-do-pdf>.



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

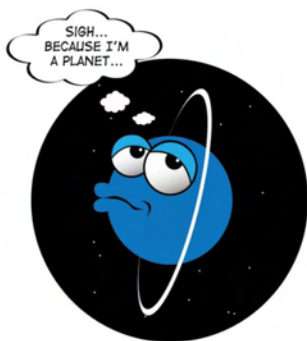
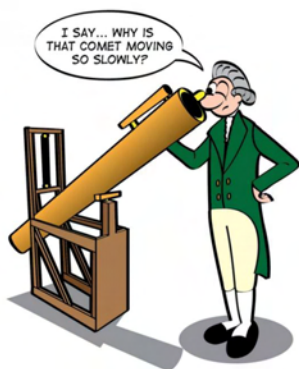
For the Classroom



What better way to decorate your classroom than with the Space Place calendar? It's now available for the 2014–2015 school year! The calendar has beautiful images and a plethora of fascinating NASA facts and trivia. You can download it month by month, or as a complete set, at <http://spaceplace.nasa.gov/calendar>.

For Out-of-School Time

Everybody loves a good story. Why not read an educational one? We've posted an entertaining new article on the discovery of Uranus. Despite being visible to the naked eye in the night sky, it was discovered thousands of years after the other visible planets of our solar system. Find out the reasons why and learn the story behind this much-delayed discovery at <http://spaceplace.nasa.gov/uranus>.



Share

Want some help spreading the word about NASA's Space Place? We've got a page with ready-to-use website descriptions, logos, and links to all our social media. Check out <http://spaceplace.nasa.gov/share>.

Send Feedback

Please let us know how you'd like to use NASA's Space Place in your teaching. Send your ideas to info@spaceplace.nasa.gov.

Special Days

September 5 – National Cheese Pizza Day.

Make a galactic mobile with the cardboard from your pizza. <http://spaceplace.nasa.gov/galactic-mobile>

September 13 – Positive Thinking Day.

Make your positive ions outnumber your negative ions when you do the "Ions in Action" experiment. <http://spaceplace.nasa.gov/ion-balloons>

September 16 – Collect Rocks Day.

Asteroids are big rocks in space. But how are they different from comets? <http://spaceplace.nasa.gov/posters/#solarsystem>

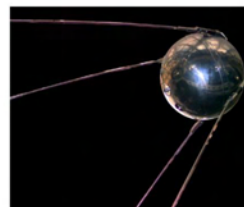
September 18 – Voyager I took first full-frame photo of Earth and Moon together, 1977.

Check out other photos of the solar system at the Space Place. <http://spaceplace.nasa.gov/gallery-solar-system>



October 4 – First satellite, Sputnik, launched by Soviet Union, 1957.

We have come a long way with satellites. <http://spaceplace.nasa.gov/earth-card-game>

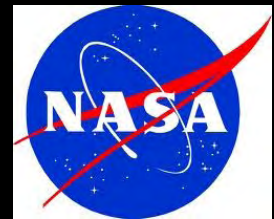


October 14 – Desert Day.

Make yummy "El Niño Pudding" for dessert today. <http://spaceplace.nasa.gov/el-nino>

October 29 – Internet Day.

Celebrate by downloading some Space Place wallpaper for your computer desktop. <http://spaceplace.nasa.gov/wallpaper>



And For The Young Stargazers:

Check out these fun websites from NASA!

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

<http://scijinks.gov>

<http://spaceplace.nasa.gov>



Where We Meet:
JENKS HIGH SCHOOL PLANETARIUM
105 E. B St., Jenks, OK

From the West: (marked in red on maps below)

Take US 75 to the Main St. - Jenks exit

Follow Main St. approximately 2 miles and cross the railroad tracks

Turn left on 1st St.

From central part of Tulsa: (marked in green on the maps below)

Take Riverside Drive to the 96th Street bridge

Turn right and go over the river

Follow A St. approximately 7 blocks

Turn right on 1st St.

From the East: (marked in blue on the maps below)

Take the Creek Turnpike to S. Elm St. in Jenks

Follow Elm St. north to Main St.

Turn right on Main St. and cross the railroad tracks

Turn left on 1st St.

For Each:

Park in the lot at the end of 1st St.

Use the doors at the north side of the building

Go up the stairs to the 3rd floor (there is an elevator for those who need it)

Turn right and go down the hallway to either side of the planetarium

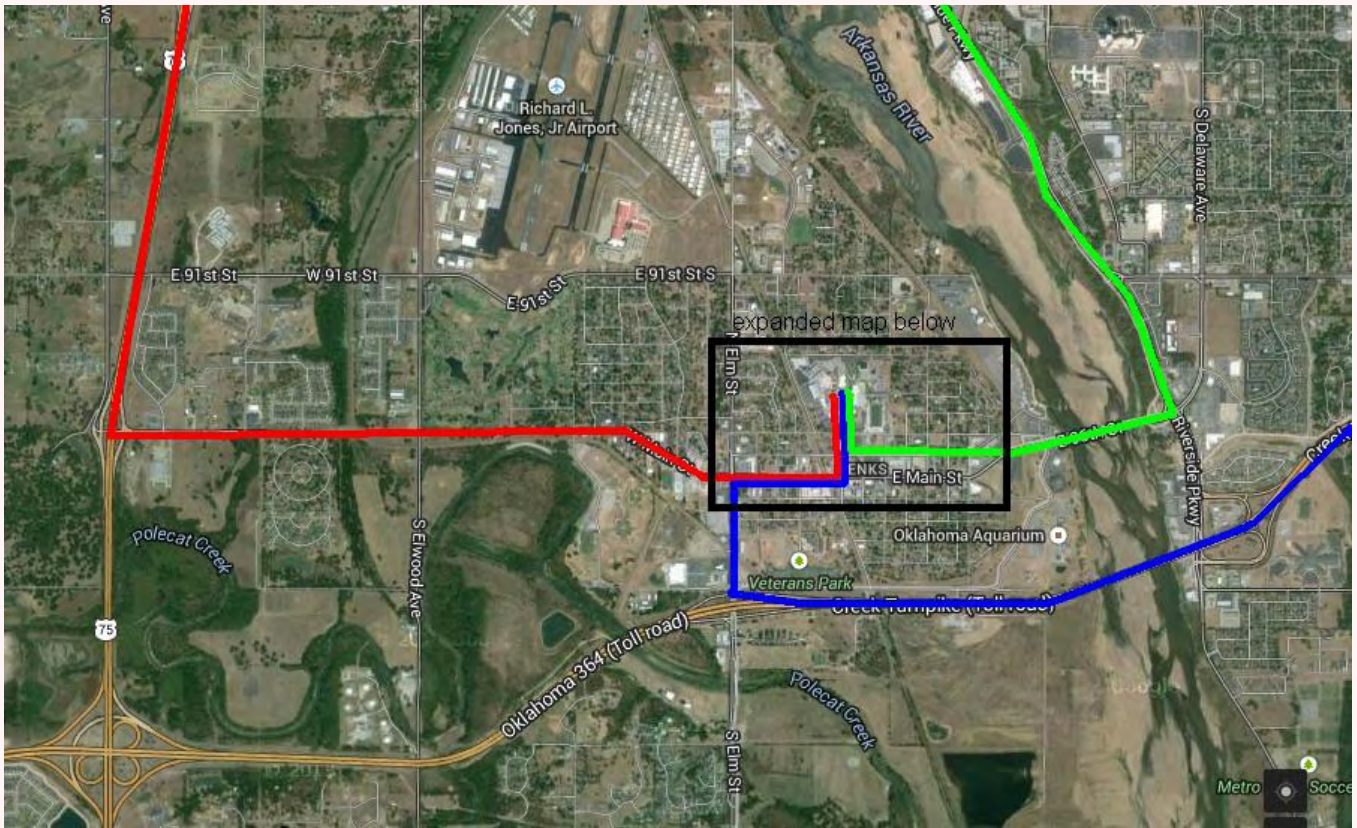
MAPS ON NEXT PAGE

The General Meetings are free and open to the public.

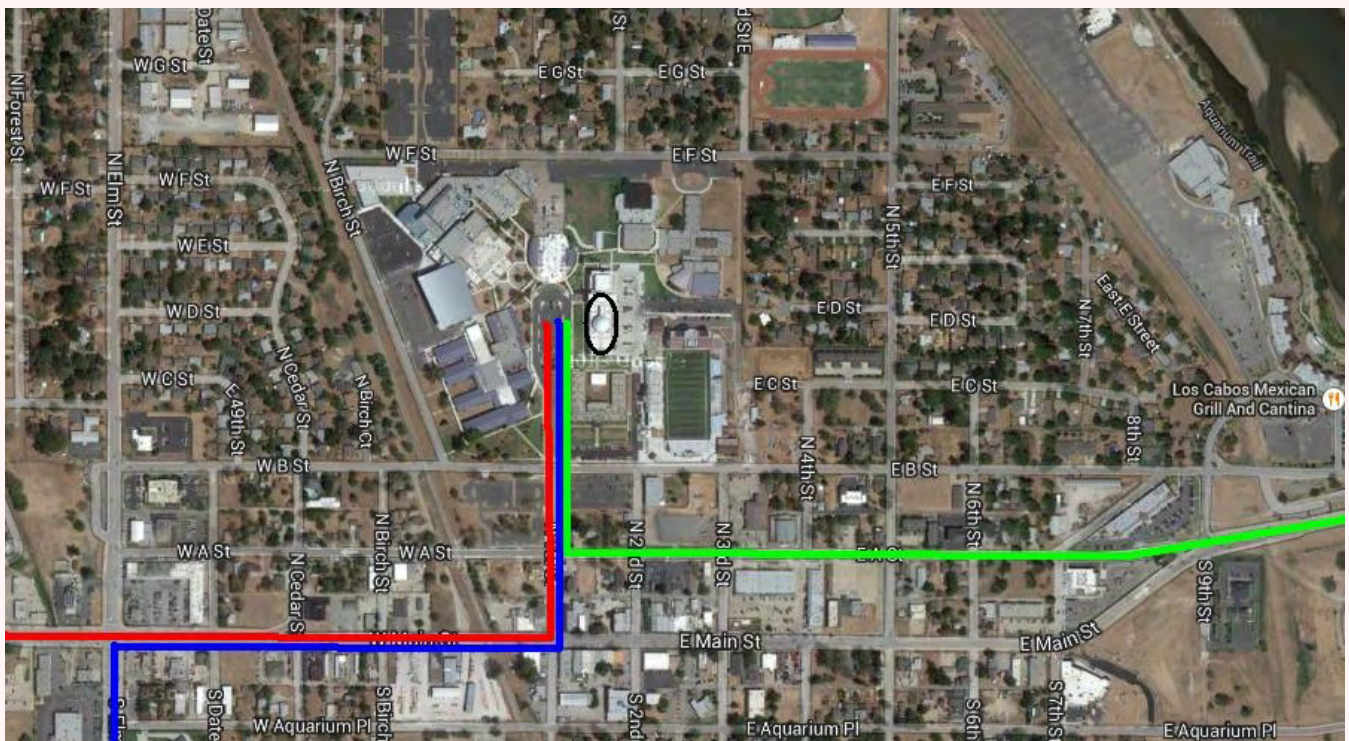
We hope to see you there!

Maps to Jenks High School Planetarium:

To get there via any of the three routes shown on previous page:



To get into planetarium parking lot:



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MEMBERSHIP INFORMATION

MEMBERSHIP RATES FOR 2014 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, or use our convenient PayPal option. .

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



Astronomy Club of Tulsa



Wishing you and yours a safe and
happy Halloween!



Photo From NASA's Astronomy Picture of the Day (APOD)

<http://apod.nasa.gov/apod/ap041030.html>

Photo: Autumn Stars Rising Over the Eastern Ridge of Camp Billy Joe, Okie-Tex Star Party 2013, by Tamara Green.

THE ASTRONOMY CLUB OF TULSA INVITES YOU TO MAKE PLANS THIS FALL TO JOIN US AT A 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.

