



Astronomy Club of Tulsa

Observer

January 2013



Photo: Orion over the AT&T Microwave Tower, ACT Observatory, by Tamara Green.





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.



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
<i>Astronomers' Starlight Cocoa</i> , Recipe by John Land	6
The Secretary's Stuff, by Tamara Green	7
<i>Astronomical League Analemma Program</i> , by Brad Young	8
<i>NITELOG - Norway InTErurban Local Observing Group</i> , By Tom Hoffelder	15
NASA's The Space Place Newsletter Jan/Feb 2013	23
Where We Meet	26
Officers, Board, Staff and Membership Info	27

January 2013

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4 Last Quarter  Public Star Party	5
6	7	8	9	10	11 New Moon  Members' Night	12 Members' Night
13	14	15	16	17	18 1st Quarter 	19
20	21	22	23	24	25 General Meeting	26 Full Moon  Sidewalk Astronomy
27	28	29	30	31		

UPCOMING EVENTS:

Members' Night	Fri., Jan. 11	ACT Observatory	6:00 PM
Members' Night (backup)	Fri., Jan. 12	ACT Observatory	6:00 PM
General Meeting	Fri., Jan. 25	TCC NE Campus	7:00 PM
Sidewalk Astronomy	Sat., Jan. 26	Bass Pro	6:00 PM

Dates for February TBA



President's Message

By Owen Green

Greetings Fellow Stargazers!

I hope everyone had a safe and good holiday season. At the start of the new year some people got new telescopes for Christmas. So, we had a meeting at Tulsa Air and Space Museum on Saturday and Sunday, January 5th and 6th. We had 16 guests show up with their new scopes. I would like to thank Stan, Skip, Richard, Mandy, Michael, John and Tamara for being there. The time went VERY quickly, plus it was a lot of fun.

Things I will be looking at this month: We will start with my favorite planet Jupiter, then the top crowd pleaser in my opinion, M42 The GREAT Orion Nebula, as well as the brightest star we can see from our planet, (with the noted exception our Sun) the Dog Star Sirius and the constellation of Leo (yup this is my sign, so you can point to Leo and tell me "Here's your Sign!" :)

This year we have three new first timers to the Officers and Board of ACT. I would like to welcome Lee Bickle as my Vice President, and Mandy Nothnagel and Jody Ray-Fleetwood to the Board.

Owen Green
President



Treasurer's and Membership Report

By John Land

I haven't had time to do a full Treasurer Report of 2012. That will appear in the February Issue once all the annual reports and tax papers are completed.

2012 was a good year for the club. We finished the year with 110 members ,of which 34 were new members. So far in 2013 we've picked up 4 new members!

The website brought in 198 visitors added to our email lists

Had a great turn out at the Telescope 101 classes. With 16 new contacts added.

Our new members from 2012 are Scott Allen and Rusty Alford

2013 new members are Carl Sluder, Ian Hudson, Linda Ghali, Hannah Thomas

Dec 31 Year End accounts: Checking \$2,253.39, Savings \$ 7,009.68

Investment account: Started 2012 at \$ 15,305.62, Ended 2012 at \$ 17,130.36 for a growth of 11.92%

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 2013 will be as follows:

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

Sr. Adult - \$ 35 per year for those 65 or older, includes Astronomical League Membership.

Students - \$ 30 with League membership; Students \$ 25 without League membership.

Additional Family membership - \$ 20 with voting rights and League membership, \$ 15 with voting rights but without League Membership. The regular membership allows all members in the family to participate in club events, but only ONE Voting Membership and one Astronomical League membership.

Join Online – Add or renew magazine subscriptions: <http://www.astrotulsa.com/page.aspx?pageid=16>

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

Astronomy is \$ 34 for 1 year or \$ 60 for 2 years. www.astronomy.com

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

Sky & Telescope is \$33 / year www.skyandtelescope.com

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

Note: **You may renew your Sky & Telescope subscription Directly Online** without having to mail in the subscriptions to the club. **NEW SUBSCRIPTIONS** must still be sent to the club treasurer.

For those cold Winter's nights at the telescope, a delightful recipe from John!



Astronomer's Starlight Cocoa

"One sip of this and you'll think you're in Chocolate Heaven"

5 Cups Instant Milk

1/2 Cup Hershey's Cocoa Unsweetened powder

16 oz. Coffee Creamer

Large container Instant Cocoa Mix (16 to 30 oz size)

Blend above ingredients thoroughly in a large covered container.

Put 1/3 cup of powder in a ceramic or insulated cup.

Add Hot Water while stirring it into the powder.

Stir until all powder is dissolved then enjoy!

Editor's Note: And to go with the cocoa, The Food Network's website has a recipe for homemade marshmallows! I have made these twice already and they are insanely good! It does not have to be the Holiday Season to enjoy these recipes. These are great for Messier Marathons! Here is a link to the recipe:

<http://www.foodnetwork.com/recipes/alton-brown/homemade-marshmallows-recipe/index.html>



The Secretary's Stuff

By Tamara Green

Happy New Year Everyone!

This edition of the newsletter will be out before our next general meeting, and we are still trying to hash out a date for our first board meeting of the year, so there are no minutes yet.

However, I can tell you we had a really great time at the Telescopes 101 Workshop at TASM on January 5th and 6th. We had a good turnout on Saturday the 5th, but not nearly as many came out to visit us on Sunday the 6th.

Volunteers from our Club included myself, Owen, Mandy, Lee, Skip, Stan, Michael and John. If I missed anyone, I apologize. I was going by who I actually saw there and did not mean to slight anyone.

I hope everyone had a good holiday season and look forward to working with all of you to make 2013 a great year for our Club.

Don't forget, if you have any articles, pictures, announcements, and what-not that you would like to see in upcoming editions of the newsletter, please send them to me at: astronomer.misstamara@yahoo.com, and I will put them in there!

Also, if you have completed an observing program and would like to receive your certificate and pin, please email those to me at the above email address as well. I will forward your log work to the appropriate Astronomical League program chair.

Clear Skies!

Tamara

ASTRONOMICAL LEAGUE ANALEMMA PROGRAM

By Brad Young

Overview

This observing program came along at the right time for me. I had just had shoulder surgery and was unable to do anything with my left arm. This left me unable to lift binoculars or a telescope, so other observing programs were not available to me for a while. It was easy for me to construct a box as described on the AL website in order to begin measuring the analemma. With the assistance of my son, I was also able to install a metal bar in our backyard and nail a board to our fence in order to create a post that would cast a shadow that I could track. We began in early November 2011 to start tracking the motion of the sun via these two methods while I was stuck at home recuperating from the surgery. After some of the issues described below, I added a third method, with images taken each day and used to track the shadow of the building I work in and a statue nearby against the features below.

Methods

Box

I did notice after a few days that I was not setting the box at exactly the same position in the driveway as I had started to originally. This caused me to have several bad readings during the first week and those have been discarded in the analysis. Once I did return to work, my first idea was to take the box with me and position it in the courtyard in front of our building each day at lunch. Unfortunately, there were two problems with this - one was consistently setting up at exactly local noon during the work day (a problem that would be repeated later with taking images). The other was the same problem I had run across at home with the box which was setting it pointing directly north the same way each day.

I have to admit, it was also a little strange also carrying around and fidgeting with a strange box in the courtyard at lunchtime with a crowd of people around in front of a tower that is a quarter sized model of the twin towers in New York City. I certainly got a few strange looks and decided this was not going to work out in the long run. Eventually, I decided to use the box only at home on days off.

Post

After a while, I noticed that the piece of metal that I had driven into the ground was not as stable as I hope so I stabilized it and was able to begin tracing the shadow of the bar more consistently. Meanwhile, as summer approached and the trees began to leaf up the post became unusable because the sun was so high that the trees cast their shadow and the post's shadow was not visible. Around August 4, the sun's position had changed enough that I could begin to use the post again.

Images

The images themselves were of some interest in developing the best way forward. I decided to take a picture of the shadow of the building I work in each day and use that in conjunction with the box and post once I had returned to work, I was still not certain the box and post would be error-free and figured that the building wasn't going anywhere unlike my positioning of the box.

Camera

Once I determine the best place in my office to measure the shadow, I started taking pictures with my cell phone each day at local noon as described before. Again, taking this picture every day when the local time is 12:24 p.m. was somewhat hindered by my work schedule. Once daylight saving time took effect and the proper time was 1:24 p.m. it became even more problematic. I decided to use software downloaded to my cell phone in order to make the pictures run off a timer and allow me to leave the phone in my office for the imaging. None of the timer programs that I downloaded were very useful and there was also the problem of positioning the phone and exactly the same angle each day - problems I had already run into with the box at home.

Webcam

At this point, I determined to start using a webcam and found a cheap one that I could position at the back window. It was useful for imaging on a timer within its own operating software. This caused me to learn how to set up a scheduled task in Windows and update the system clock more rigorously using the internet. It was these and other computer tasks that I had not come across before that added an additional educational experience with this program.

For a while, everything ran smoothly. I used the webcam to take a picture of both the shadow of the building and this sculpture below, which is called "The Artificial Cloud" next to the "Center of the Universe" tourist spot in Tulsa. Ultimately, I discarded using the cloud shadow due to foreshortening in summer.

But, soon enough, I ran into a new problem; my desktop computer would time out on occasion. Even though I had set up a scheduled task the security settings at work would cause it to be locked down at just the wrong moment. I was able to get around the security settings at first but then a new and even stricter policy was implemented and there was no way to avoid the time out.

I brought up a separate, ancient computer just to run the webcam, running independently of the security programs associated with my work computer system. Somewhere about the same time, the shadow shifted enough that the webcam was not set at the right angle and I lost a few days of shadows. There are also a few days missed here and there when I was out of town and the security system on my work desktop shut me down. Even after I had moved off of the workplace network I figured out that the old desktop I had brought in was not consistently running the scheduled task that I had set up. Working with the software company for the webcam I was able to fix a few glitches with their software and get things running more smoothly at the cost of a few more days here and there of images that were missed.

Finally, one more timing problem surfaced. While I had been attached to the Internet I had been able to run a recurring update to correct the time on my computer each day. Once I was decoupled from the Internet the old computer consistently ran fast on the clock time causing a discrepancy between the image time and local noon. I wrote a short Excel spreadsheet to check against WWV time signals every few days and select the closest image to the one desired after taking into consideration the time correction. True to form, the first time corrections went the wrong way, and the images selected were too early.

Math

The math involved with plotting the analemma was fairly straightforward trigonometry. The methods used for each determination required by the program are available on the internet or your old Spherical Geometry textbook. Instructions for doing the program and building the box on the AL website, at:

http://www.astroleague.org/Analemma_Introduction

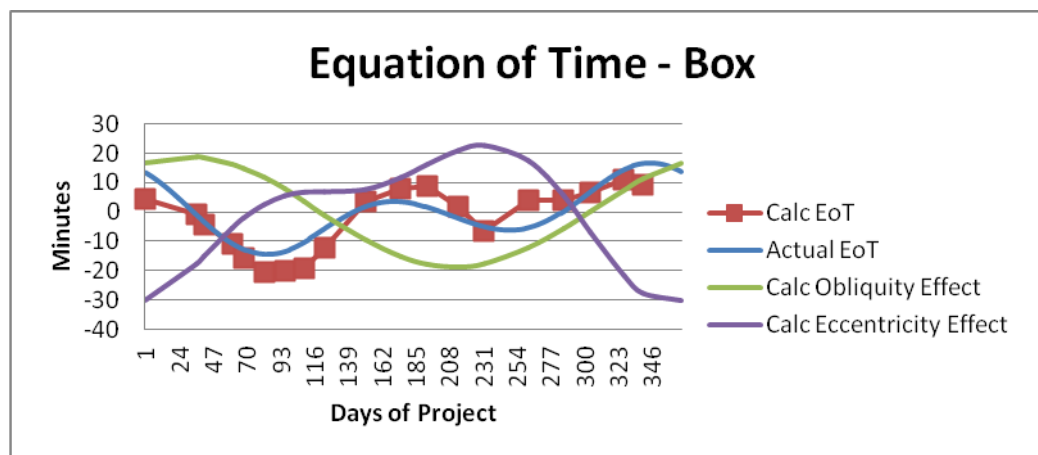
{Did you really think I was going to show you how to do the math?}

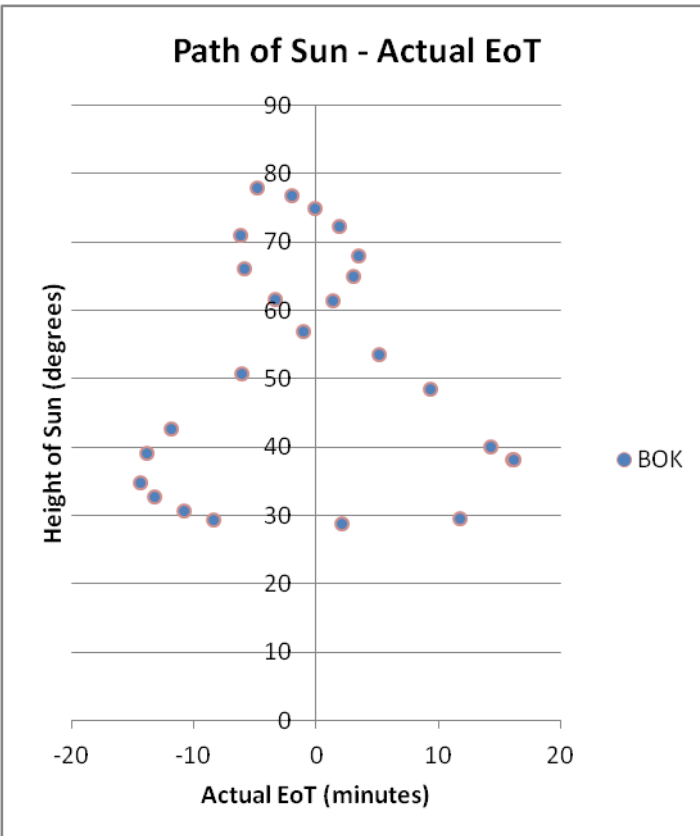
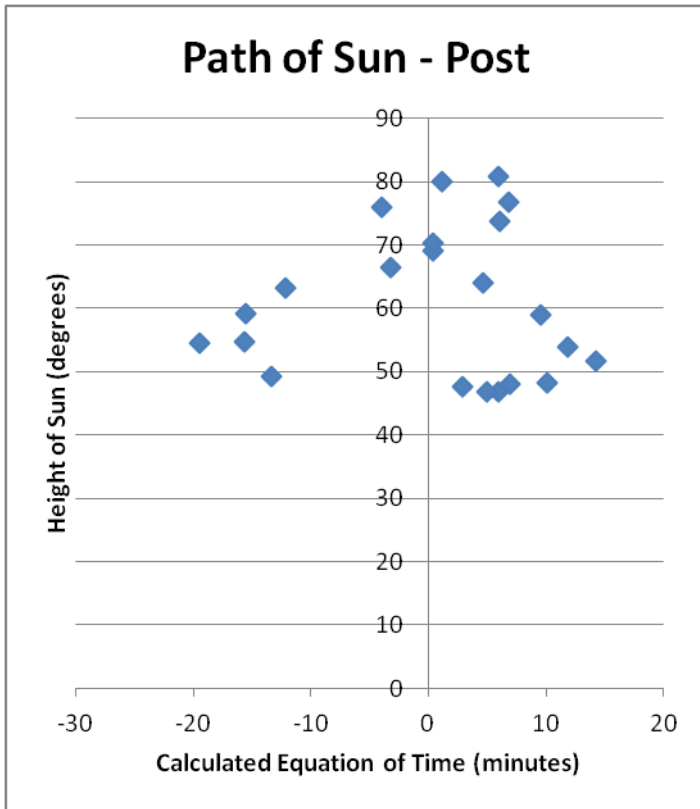
Measurements

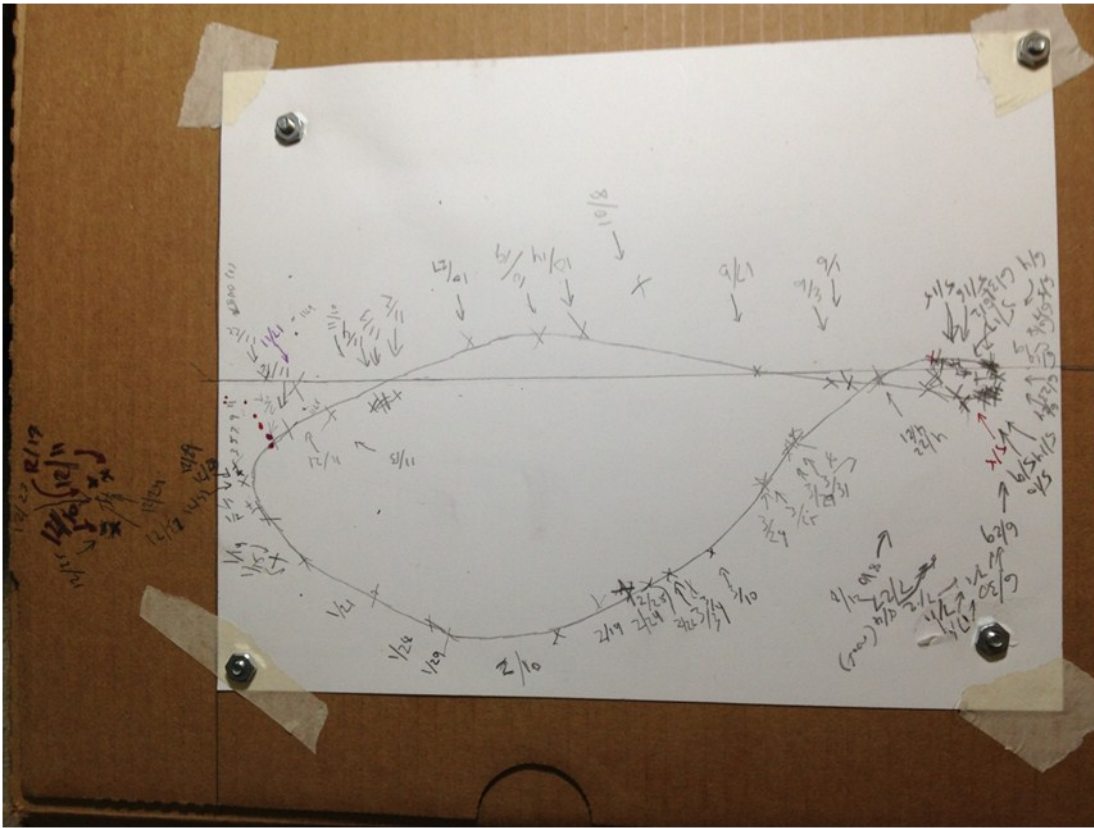
Results of the project are below, including my calculated values, sample plots, photos of the box and post analemmas, an example daily webcam shot, and the overall webcam plot on a Google Earth map.

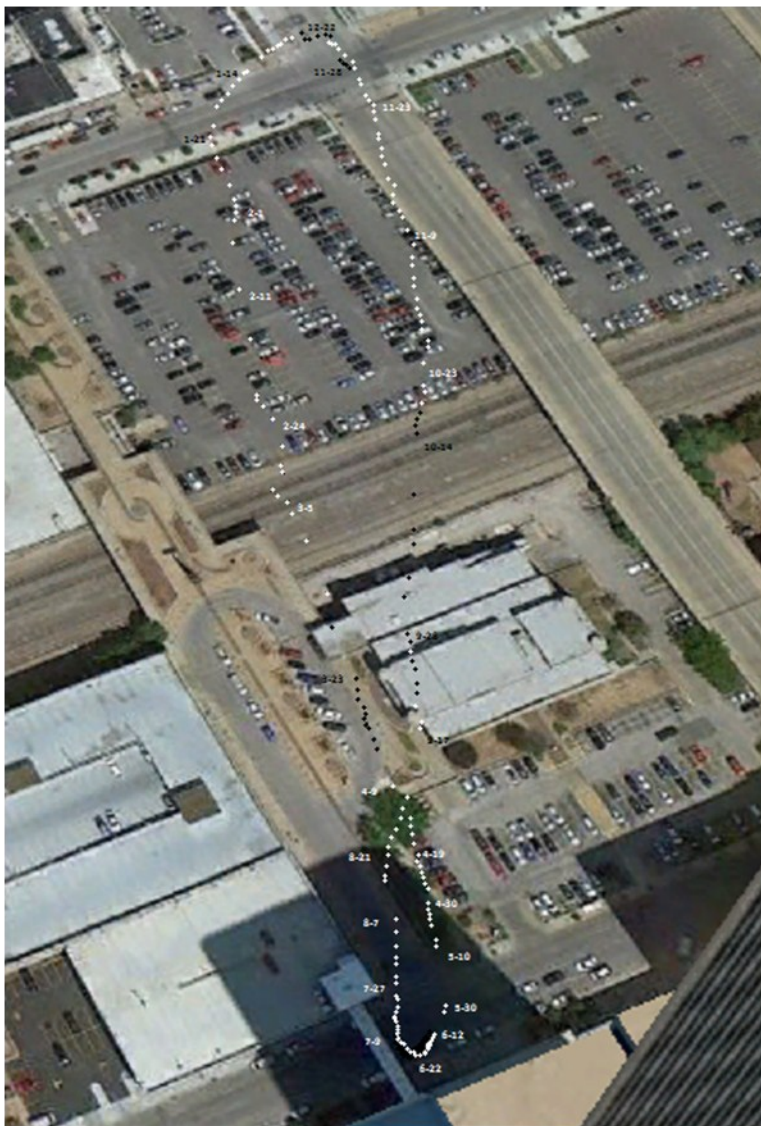
ANALEMMA PROGRAM SUMMARY RESULTS

Activity		Box	Post	BOK	Actual
1	Obliquity of Earth's Orbit	22.9	18.0	24.0	23.5
	Latitude of Observer	37.4	28.2	37.1	36.1
2	Sun Path in Sky - See Graphs				
3	Equation of Time - See Graphs				
4	Eccentricity of Earth's Orbit	0.0146	0.0147	0.0146	0.0167









Results

The results were not as accurate as I had hoped, but they do provide some idea of what the analemma looks like. The major error appears to be in time, with minor errors introduced by measurement of distance. This is certainly historically predictable; accurate timekeeping is one critical reason for deriving the EoT in the first place. The three methods had their problems as already mentioned above, but the method I'd hoped would be most accurate (BOK) suffered from another unforeseen one – map projection. I suppose I could have painted spots on the parking lot, but that seemed more risky than running around with a strange box!

Probably the most important lesson I was reminded of is that experiments can be messy. Even using three methods did not negate the systemic errors that often affect empirical data. I did learn a few things about computer time updates and using a webcam. I also gained a new respect for the ancient astronomers that first began to measure the analemma and derive Earth's orbital details from it.

NITELOG - Norway InTERurban Local Observing Group

by Tom Hoffelder, via Email Message

Wow, it's 2013 already? Who ordered that?!?! Anyway, Happiest of New Years to all! Starting off with a bang - if January is any indication, it's going to be a great year for astronomy!

OBSERVING: Jan 7th, 7:30 PM, at the Twitchell Observatory, which is the reason the first date noted on the spreadsheet is the 7th, instead of the 5th as it would have been in previous "editions." (If clear, I plan to set up our C14.) If anyone else plans any observing anywhere on any other days, and would like some company, I'm hoping this email will provide the means of coordinating other sessions in Maine. (Not just this month.)

COMETS: 2012 K5 (LINEAR) could be interesting. Things to note: 1) predicted magnitudes are all over the place, 2) on the night of the 7th it will coincidentally be in a binocular field with one of the listed deep sky objects, open cluster NGC 1647, and 3) it is zipping right along, moving more than 3 degrees per day, thus the chart for that evening. For up to date magnitudes these two sites can be helpful:

<http://www.aerith.net/comet/weekly/current.html>

<http://www.observatorij.org/cobs/>

PLANETS: Jupiter rises around 2 PM on the first and doesn't set until after 4 AM, so is in the sky a good chunk of the night. By the end of the month it of course sets about two hours earlier. Note there are four events (bold) in the `jup.jan` file when the red spot and a moon shadow should be visible at the same time. (Both are listed for the evening of the 7th, however it will be difficult to see them simultaneously.) Saturn begins to get serious about showing itself, but still doesn't rise until after midnight (12:30) on the 31st.

***DWARF PLANET*:** If you've never seen one (in this case one a.k.a. an asteroid), you might want to get a glimpse of Ceres. Chart gives locations (tip of arrow) from the 5th thru the 14th, when the magnitude drops from 7.2 to 7.5. And if you really want to get crazy, go for a second asteroid, Vesta. Locations for the same dates are shown on the comet chart; Vesta's mag will then range from 7.0 to 7.2.

**NITELOG - Norway InTErurban Local Observing Group*, by Tom Hoffelder, Ct'd.*

STARS:** Three carbons with blue minus visual mags of 3.2 to 3.6; maybe not red enough to knock your socks off completely, but partial removal could result. The multiple stars include my favorite, 40b Eri, whose components are 9.5 and 11th mag, so obviously not my fave due to appearance. Not only is it a unique combination of a red dwarf and a white dwarf, but it is the *** ONLY white dwarf easily seen in small scopes. And the Trapezium, which normally wouldn't be listed (most objects are ones you may not have seen, which is why M1 and M42 are not there), is included for the challenge of seeing how many of the dimmer stars (first attachment) can be seen in your scope. (Note: crank up the power for that, under a relatively steady sky.)

THE GOOD STUFF: Five open clusters (one a Messier), one (the only winter?) globular (also a Messier), two planetaries - one bright, one not so much, four diffuse nebulae and four galaxies, the most distant (known) being 90 million ly away. Couldn't find a distance for the NGC 1611 group, but it is at least 100 million and possibly 150 based on size. And let's not forget Kemble's Cascade, a lovely sight in binocs or wide field scopes, being a 2.5 degree long line of about 15 stars.

***SUPERNOVA:** ***Last and definitely not least, how often do you get to see a single star 65 million light years away? (OK, the bang actually happened long ago in a galaxy far far away, not this January.) SN 2012ht, a type Ia in NGC 3447, recently attained a magnitude of 12.8. It should remain around that value for a couple weeks, so - if the limiting magnitudes are correct in the Trapezium info - an 8 inch would be adequate for detection. Located in eastern Leo, viewing would commence around 10 PM on the 7th.**

QUESTIONS:* As always, questions and comments are welcome!

Tom H.

***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.**

1/7					1/12				
SS	CTE	NTE	ATE	MR	SS	CTE	NTE	ATE	MS
16:20	16:53	17:29	18:04	02:40	16:26	16:58	17:34	18:09	17:50

Comet	ra	dec	star	n/s	e/w	n/s/day	e/w/day	mag ¹	mag ²	uran #	date*
C/2012 K5 (LINEAR)	04 57.5	+18 21	α Tau	1.7 N	5.3 E	3.0 S	1.5 W	8	11.0	134	1/7
C/2012 K5 (LINEAR)	04 32.0	+06 06	π ⁴ Ori	0.4 N	4.8 W	1.8 S	0.9 W	8	11.5	179	1/12

¹from <http://www.aerith.net/comet/future-n.html>

*at 7 PM

²from <http://www.minorplanetcenter.net/iau/Ephemerides/Comets/>

Object (Type)	ra	dec	star	n/s	e/w	Mag*/(# of Stars)	Size (")/ Sep (")	Spect/ M# or H#	Dist (ly)	Urano l Page	Comment [B-V] (optimum x)
W Ori	05 05.4	+01 11	π ⁵ Ori	1.2 S	2.8 E	6.5-10		C		224	B-V=3.6
TX Aur	05 09.1	+39 00	η Aur	2.2 S	0.5 E	8.5-9.2		C		65	B-V=3.2
Y Tau	05 45.7	+20 42	ζ Tau	0.4 S	1.9 E	7.1-9.5		CII		136	B-V=3.4
40 Eri (o ²)	04 15.3	-07 39	β Ori	0.5 N	14.5 W	4.5, 9.5	83	K1	16	268	(6)
40b Eri	---	---	---	---	---	9.5, 11	7.6	dA,dM4	16	268	(65)
32 Eri	03 54.3	-02 57	prev	4.7 N	5.2 W	5, 6	6.9	G8, A1		222	(70)
β87	04 22.4	+20 48	ε Tau	1.6 N	1.5 W	6, 9	2.0	gM0, A0		133 (ni)	(240)
β Ori	05 14.5	-08 12	---	---	---	0, 7	9.4	B8, B9	900	270	(50)
θ ¹ Ori	05 35.3	-05 23	---	---	---	5,7,7,8	13,13,15	O6,B0,A7	1300	271	
ζ Ori	05 40.8	-01 57	---	---	---	2, 5, 5	2.3	B0, ?	1600	226	(220)
NGC 1502 (OC)	04 07.8	+62 20	λ Per	10.0 N	0.1 E	(15)	20	H47-7	3750	18	
Kemble's Cascade	03 59	+62 50	prev	0.5 N	1.0 W	(15)	150	---		18	
NGC 1501 (PN)	04 07.0	+60 55	(1502)	1.4 S	0.1 W	11.5	0.9	H53-4	13,600	18	
NGC 1528* (OC)	04 15.4	+51 13	λ Per	0.9 N	1.3 E	(80)	18	H61-7	2,800	39	
NGC 1532 (SBb)	04 12.1	-32 52	41 Eri	0.9 N	1.2 W	[13.6]	11X3	---	50M	356	+1531
NGC 1535 (PN)	04 14.3	-12 44	γ Eri	0.8 N	4.0 E	9.6	0.9	H26-4	2150	268	1538 (GX) 0.5 S
NGC 1611* (S0a)	04 33.1	-04 18	ν Eri	0.9 S	0.8 W	[13.5]	2X0.6	H586-3		223	1609/12/13
NGC 1647 (OC)	04 45.9	+19 07	α Tau	2.5 N	2.5 E	(30)	40	H8-8	3600	134	
NGC 1746 (OC)	05 03.8	+23 46	τ Tau	0.8 N	4.9 E	(60)	40	---	3250	134	
NGC 1788* (DN)	05 06.9	-03 20	β Eri	1.8 N	0.2 W		5X3	H32-5	3250	225	
NGC 1904 (GC)	05 24.2	-24 31	β Lep	3.8 S	0.9 W	7.7	9.6	M79	43K	315	
NGC 1886* (Sbc)	05 21.8	-23 49	prev	0.7 N	0.6 W	[12.9]	3.1X0.4	---	90M	315	
NGC 1931* (DN)	05 31.4	+34 15	β Tau	5.5 N	1.0 E		6	H261-1	8150	97	M36 0.1 S/1.0 E
NGC 1964* (SBb)	05 33.4	-21 57	β Lep	1.2 S	1.2 E	[13.2]	5X2	H21-4	70M	315	
NGC 1999* (DN)	05 36.4	-06 43	ι Ori	0.9 S	0.2 E		2	H33-4	1300	271	
NGC 2024* (DN)	05 41.7	-01 51	ζ Ori	0.1 N	0.3 E		30	H28-5	1300	226	
NGC 2099 (OC)	05 52.3	+32 33	θ Aur	4.7 S	1.6 W	(150)	15	M37	4700	98	

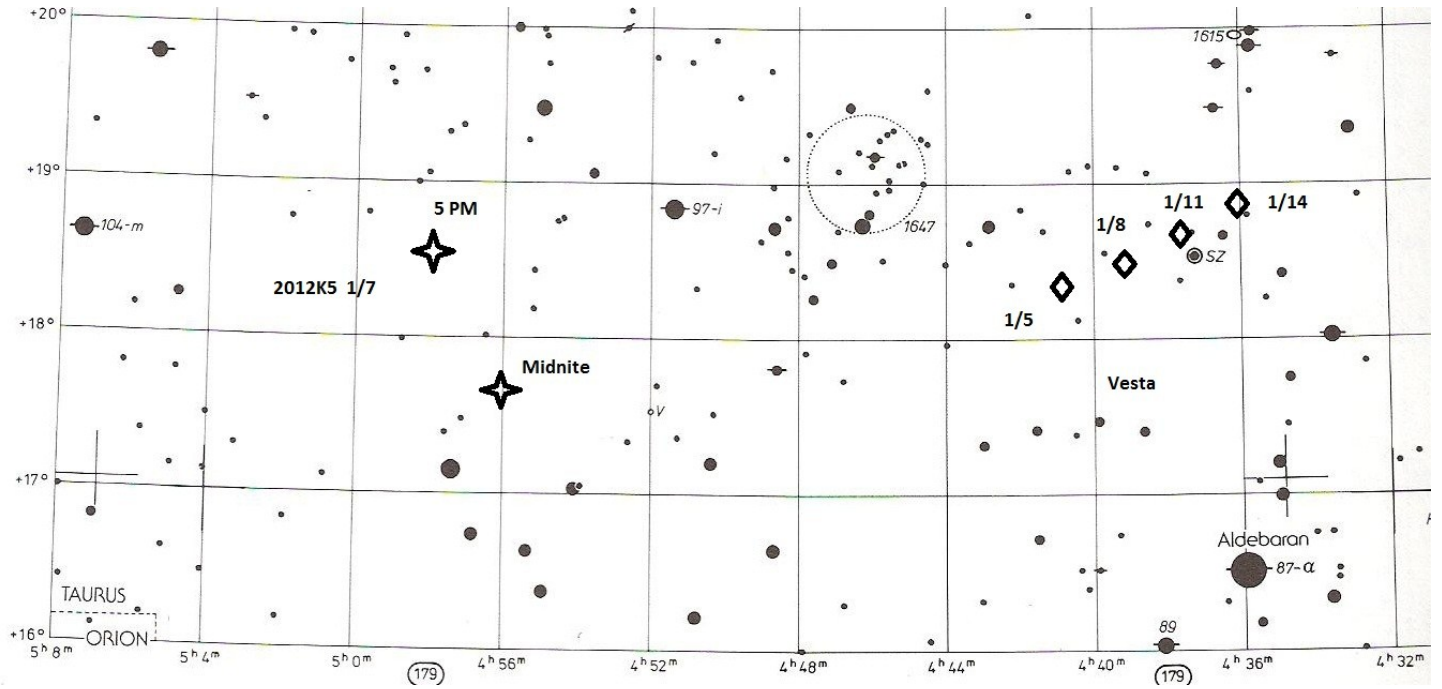
*[Surf Brtnss for GX's] -

*DSS image

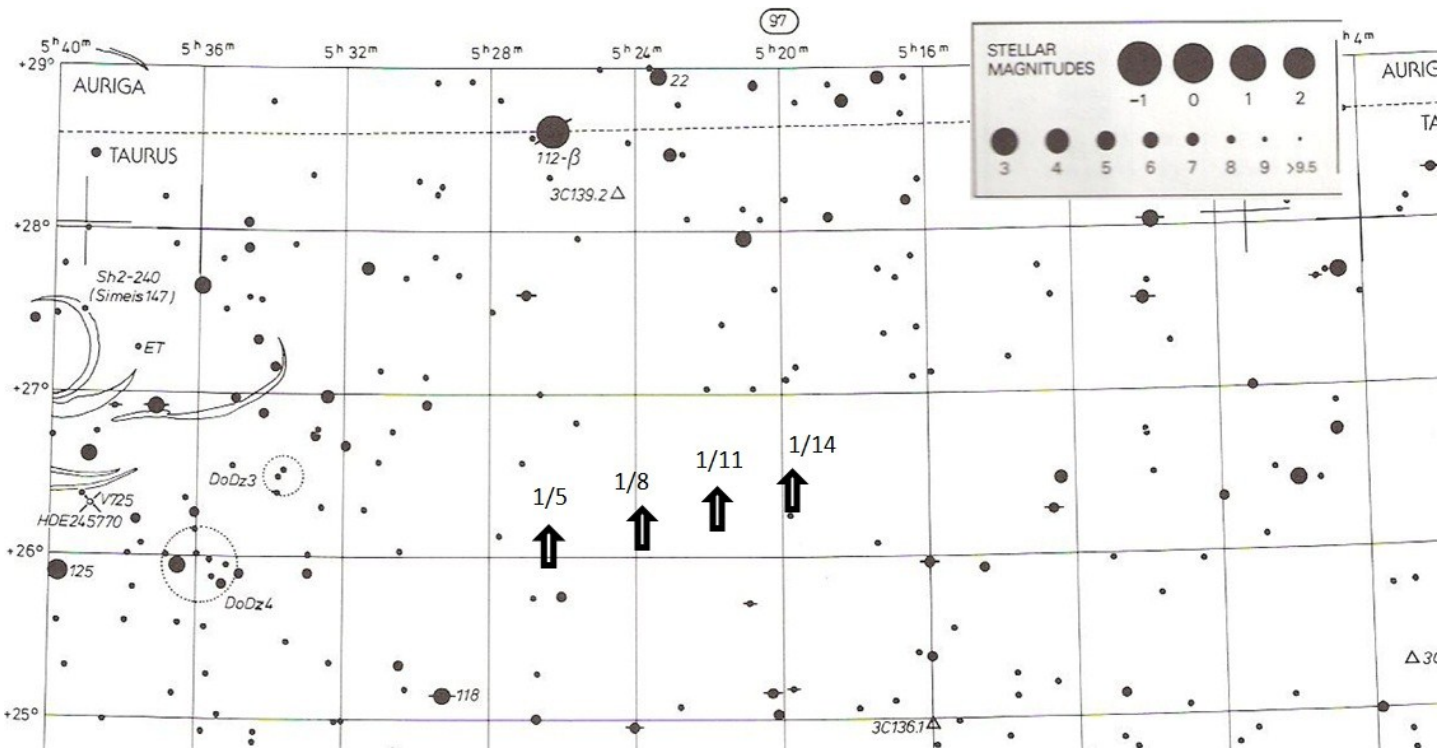
ni=shown but

mag per square arcmin

not identified



Comet 2012 K5 LINEAR Chart



Ceres Chart

Editor's Note: Below is the portion of the Jupiter Spreadsheet for Jan. 1-15, 2013. The whole was too large to fit all onto this page. Jan. 16-31 next page.

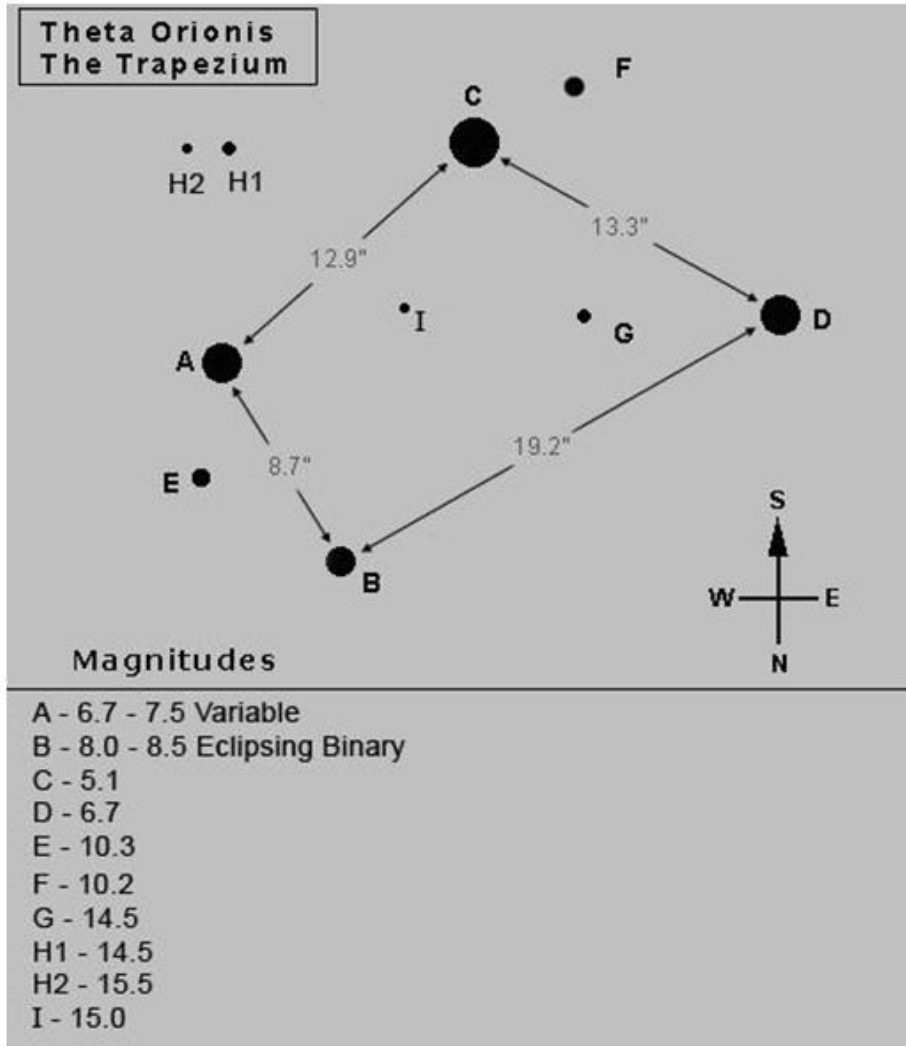
JUPITER IN JAN 2013 (EST)

DATE	GRST*	I SHAD	E SHAD	G SHAD	C SHAD
1		19:00-21:10			
2	21:07				
3	16:58				
4	22:45				
5	18:37				
6					
7	20:15	02:26-04:37	17:10-19:34		
8		20:55-23:06			
9	21:53				
10	17:45			17:40-19:52	
11	23:32				
12	19:23				
13					
14	21:01		19:46-22:10		
15	16:53	22:50-			

Below is the spreadsheet for Jan. 16-31.

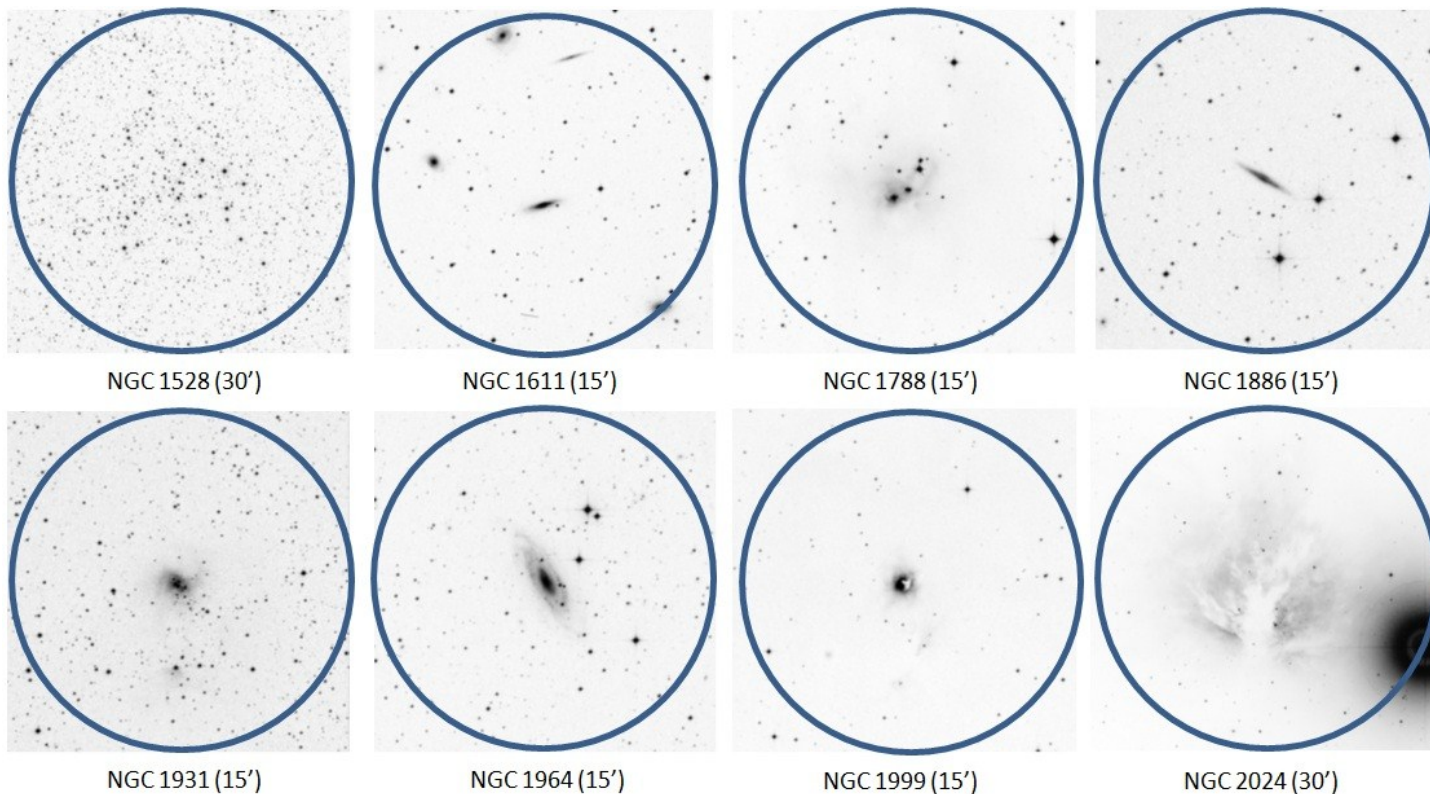
16	22:40	01:01			
17	18:31	17:19-19:30		21:41-23:54	
18					
19	20:10				
20					
21	21:48		22:22-		
22	17:40		00:46		
23	23:27	00:46-02:57			
24	19:18	19:15-21:26			
25				01:41-03:55	
26	20:57				
27					
28	22:35				
29	18:27		00:58-03:22		
30					
31	20:07	21:10-23:21			

*Time of transit; spot is visible +/- one hour

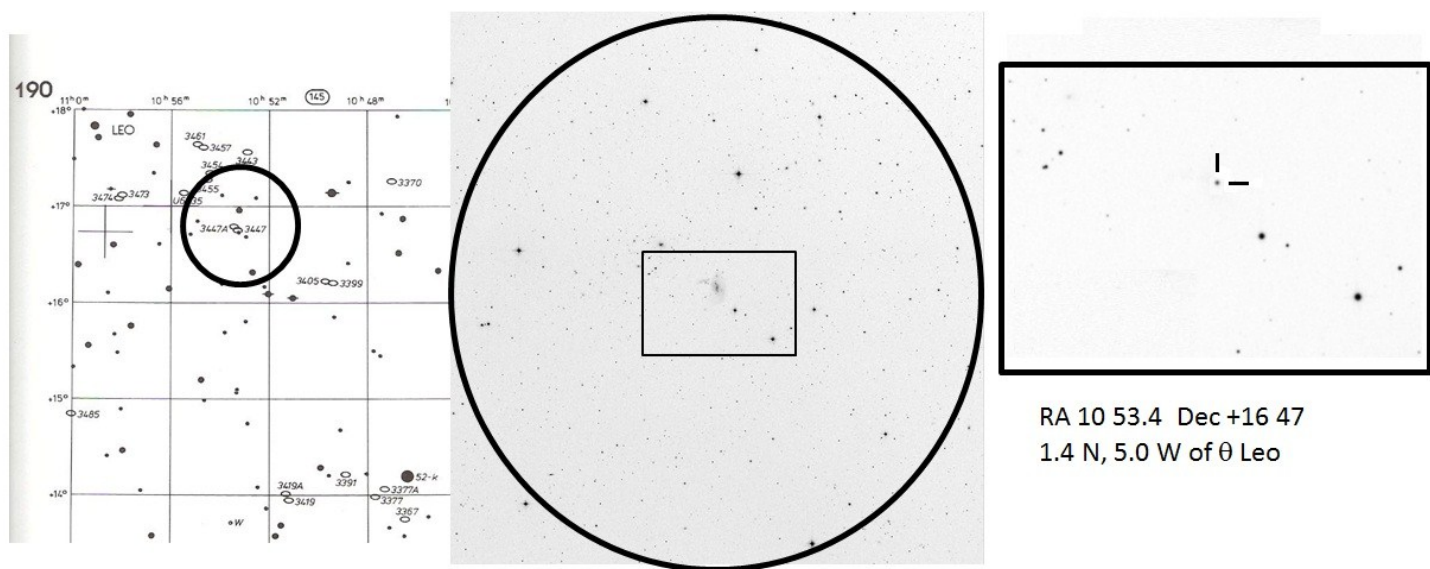


Dia (in)	Mag
3	11.2
4.25	11.9
6	12.7
8	13.3
10	13.8
12	14.2

Trapezium Chart



Good Stuff!



Supernova!



the Space Place

January - February 2013 / Vol. 6, Issue 1

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.

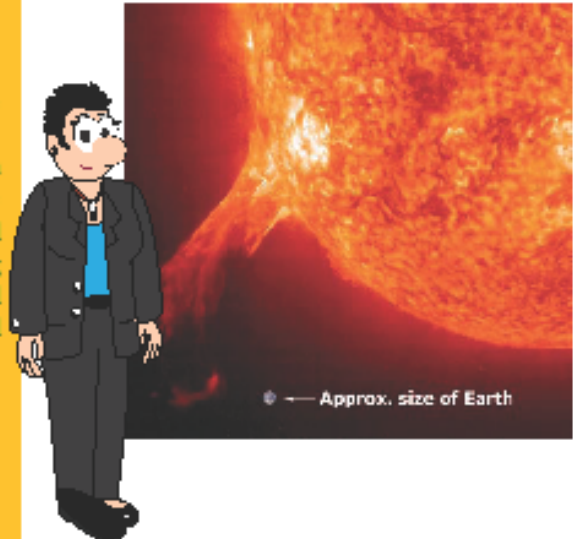
- It's colorful!
- It's dynamic!
- It's fun!
- It's rich with science, technology, engineering, and math content!
- It's informal.
- It's meaty.
- It's easy to read and understand.
- It's also in Spanish.
- And it's free!

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 in the lucky position to have a love-hate relationship with its star. We say lucky, because obviously we couldn't live without it, but at times it's a little difficult to live with it as well. We call the conditions around our planet, outside of its own atmosphere and magnetosphere, "space weather," but it definitely affects us on Earth too. It's a good thing we are learning to understand and predict the sun's "tantrums."

Let's start here

"Space Place Live!" is a cartoon "talk show" where Space Place characters interview real NASA scientists and engineers. The latest episode stars Merav Opher, astrophysicist. She studies how stars work, including our star. In this 7-minute video, we learn about the solar wind, solar flares, the heliosphere, and the environment the Sun creates for everything in the solar system. Dr. Opher also talks about how she got interested in physics and what else she likes to do for fun. Check it out at spaceplace.nasa.gov/spaceplace-live/#opher.



Space Place en español



La historia de una extraña noche de tormenta (solar)... tells the story of a strange and (solar) stormy night. Along with a story of the severe solar storm of August 1859, where the Northern Lights were seen as far south as Central America, "Shields Up!" (¡Escudos arriba!) is a game in which the player has to protect Earth-orbiting satellites from the wrath of bad space weather. The game and article are available in Spanish and English. See spaceplace.nasa.gov/sp/shields-up.

Spotlight on all things Sunny . . .



Heliophysics, or the physics of the Sun, is one of the four major science thrusts of NASA's Science Mission Directorate. (The others are astrophysics, Earth science, and the solar system.) On The Space Place, these translate to the menu tabs Space, Sun, Earth, and Solar System.

The Sun-Earth connection is so important in understanding our immediate environment. The Sun menu (spaceplace.nasa.gov/menu/sun) offers activities, games, and fun facts about the Sun and how it affects Earth. The most comprehensive treatment of this relationship is the animated, narrated storybook "Super Star Meets the Plucky Planet: Or, how Earth and Sun come to mutual understanding and respect." It is also available to print and read aloud or have the students read aloud (spaceplace.nasa.gov/story-superstar).



For the classroom







The Gallery of Sun images (spaceplace.nasa.gov/gallery-sun) is just for teachers to print and post in the classroom. They have large, simple captions.


For out of school time

"Satellite Insight" is an absorbing game for all ages that runs on both computer and iPhone or iPad. It is Tetris-like, where six tile colors represent different types of data measured and recorded by the GOES-R satellite. Bonus material explains what each of the tile colors stand for, such as clouds, lightning, and solar energy. A lot of them stand for data related to space weather.

Your mission is to help the GOES-R (for Geostationary Operational Environmental Satellite, Series R) satellite collect data using its six advanced instruments.

Blocks of six different colors represent each instrument's type of data:

-  Clouds (from the Advanced Baseline Imager)
-  Solar energy (from the Solar Ultraviolet Imager)
-  Radiation (from the Extreme UV/X-ray Irradiance Sensor)
-  Magnetic field (from the Magnetometer)
-  Lightning (from the Geostationary Lightning Mapper)
-  Charged particles (from the Space Environment In-Situ Suite)



Special Days

Jan. 7, 1610: Galileo discovered Jupiter's four largest moons.

Explore Jupiter's big moons in the Solar System Explorer game. spaceplace.nasa.gov/solar-system-explorer

Jan. 15, 2006: Stardust mission capsule returned comet samples to Earth.

Learn about comets and how they are different from asteroid with the Comet vs. Asteroids 4-page color brochure. spaceplace.nasa.gov/posters/#asteroids

Jan. 31, 1958: Explorer 1 was the first U.S. satellite launched into orbit.

How do orbits work, anyway? Find out by putting a cannonball into orbit! spaceplace.nasa.gov/how-orbits-work

Feb. 9, 1894: Hershey Chocolate Company founded.

Although made by a different company, celebrate chocolate and the Moon with the Oreo Cookie Moon activity. spaceplace.nasa.gov/oreo-moon

Feb. 19, 1473: Nicolaus Copernicus born

He thought the Sun was the center of the Universe. He was wrong. But just where IS the center? Dr. Marc answers in a short Podcast. spaceplace.nasa.gov/podcasts/#center

Feb. 22: Thinking Day.

The Spitzer memory game will make you think very hard. spaceplace.nasa.gov/spitzer-concentration



Send feedback

Please let us know your ideas about ways to use The Space Place in your teaching. Send to info@spaceplace.nasa.gov.



For Young Stargazers

Check out these fun websites from NASA!



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

<http://scijinks.gov>

<http://spaceplace.nasa.gov>



Where We Meet:

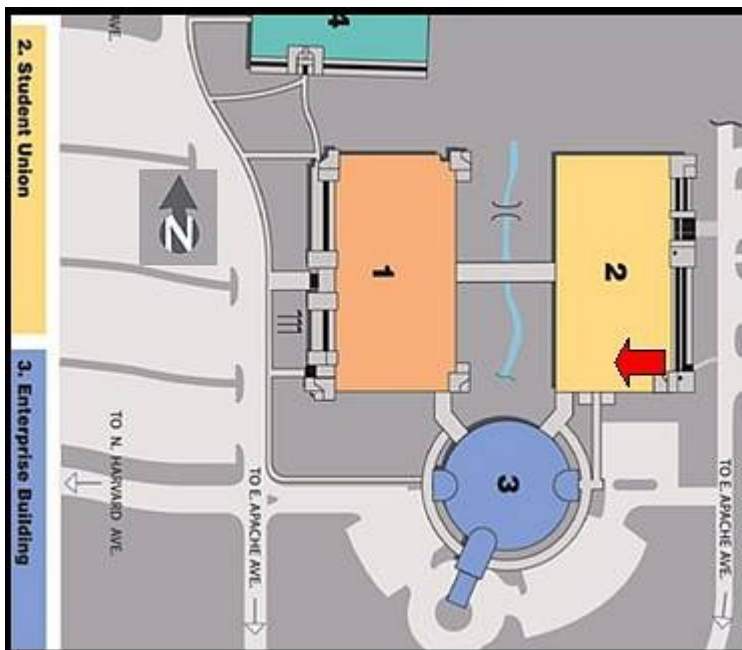
TCC Northeast Campus, 3727 E. Apache St., Student Union Bldg. 2, Room 1603

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!



Our General Meeting will be on Friday, January 25 at 7:00 PM.

Program: TBA

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 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

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>



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.

