



Astronomy Club of Tulsa

Observer

June 2014



Photo: Summer stars over our Observatory, by Tamara Green.

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JUNE 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					

JULY 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		

UPCOMING EVENTS:

Sidewalk Astronomy	Sat, Jun 14	Bass Pro	8:15 PM
Fathers' Day	Sun, Jun 15		
Public Star Party	Sat, Jun 21	ACT Observatory	8:15 PM
SUMMER SOLSTICE	Sat, Jun 21		5:51 AM CDT
Observatory Appreciation	Fri, Jun 27	ACT Observatory	Before Observing
Members' Night	Fri, Jun 27	ACT Observatory	8:15 PM
Observatory Appreciation Day	Sat, Jun 28	ACT Observatoty	9:00 AM
Back-Up Night	Sat, Jun 28	ACT Observatory	8:15 PM
Observatory Appreciation Day	Sun, Jun 29	ACT Observatory	9:00 AM
Independence Day	Fri, Jul 4		
Sidewalk Astronomy	Sat, Jul 12	Bass Pro	8:15 PM
Public Star Party	Sat, Jul 19	ACT Observatory	8:15 PM
Members' Night	Fri, Jul 25	ACT Observatory	8:00 PM
Club Cookout/Potluck	Sat, Jul 26	ACT Observatory	8:00 PM



Astronomical League Conference



The Stars are Big and Bright, Deep in the Heart of Texas

July 10-12, 2014, Hilton San Antonio Airport Hotel

Register: <http://alcon2014.astroleague.com>

Why Attend ALCon?

By John Goss

Vice President, Astronomical League

Meet and learn from the full range of your fellow astronomy enthusiasts, professional and amateur:

At this year's Astronomical League Convention, July 10-12, in San Antonio TX, you will rub shoulders with, among others, research astronomers, authors, university professors, and amateurs from across the country, as well as officers of the Astronomical League and partnering organizations. You will listen to and speak with people well versed in imaging, outreach, equipment, club improvement, youth in astronomy, the art of observing, and the science of astronomy.

The Star BQ is a great time to learn, share and discover!

Join us for our annual and popular Star-BQ on the evening of Thursday July 10. This relaxed and informal event will be held at the San Antonio Airport Hilton, the same venue as the ALCon talks. We are very fortunate to have as our guest speaker Dr. Mike Endl of the University of Texas, Austin. His research efforts have focused on the search for extra-solar planets, notably those that might possibly be part of the Alpha Centauri star system.

This is a great time to meet other ALCon participants including amateurs, professionals, speakers, and organizers. Learn about their observing interests, find out about their clubs and organizations and how they do things, share your experiences under the night sky. Discover how you can enhance your time under the starry sky. This is a great time to learn, share, and discover while having fun doing it!

Awards Banquet Keynote Presentation

Space challenges our imaginations and beckons exploration. We are very fortunate to have a person who is an astronaut, explorer, inventor, and amateur astronomer as our ALCon 2014 Keynote Speaker, Dr. Don Pettit!

In his three space missions of exploration, he logged 370 days in Earth orbit and 13 hours of spacewalk. His accomplishments are many.

To name a few...

Arriving on the Shuttle Endeavor, he was a mission specialist aboard the International Space Station in 2002 and 2003. He conducted fun science demonstrations that he called *Saturday Morning Science*. One of them showed how fluids, such as water, behave in a low gravity environment.

Another, conducted on an extended mission aboard the ISS in late 2011, used figures from the game *Angry Birds* to illustrate the physics of motion in micro gravity.

One of his more serious science experiments investigated the clumping nature of solid particles less than 6 millimeters in diameter in a micro gravity environment. The results helped clarify the mechanisms, primarily electro-static, behind the beginnings of planet formation.

Dr. Pettit has occasionally assumed the role of inventor during "down time" from his NASA duties. Zero-G coffee cup? Barn door tracker for imaging city lights from the ISS? Don Pettit invented them in his spare time!

Before his last space mission, he explored Earth's south polar region collecting meteorite samples. During periods spent tent-bound due to inclement weather, he continued his *Saturday Morning Science* series, this time to investigate Antarctic ice. Along with conducting photographic surveys of glacial ice crystals, he found magnetic micrometeorites in ice melt used for cooking water.

Dr. Don Pettit: astronaut, explorer, inventor, amateur astronomer — and now ALCon 2014 Keynote Speaker.

ALCon 2014 Speaker List

By Robert Reeves

Here are some of the speakers we will have for you at ALCon 2014 in San Antonio:

Don Pettit: astronaut, Saturday night keynote speaker, one-year resident of the ISS, amateur astronomer who gets to do astronomy from the space station. He will speak about science and life in space.

Don Olson: physics professor at Texas State University and author of Sky & Telescope's articles on astro-forensics and how astronomy has affected history. He will talk about his astro-sleuthing.

Steve Ramsden: coordinator of the Charlie Bates Solar Astronomy Project. Steve will talk about the sun and astronomy public outreach.

Dr. Mike Endl: Research Scientist, McDonald Observatory, University of Texas. Our Thursday night keynote speaker will discuss the search for extrasolar planets.

Dr. Amanda Bayless: Research Scientist from Southwest Research Institute, will talk about stellar binaries.

Forrest M. Mims, III: amateur scientist, magazine and newspaper science writer and columnist from San Antonio, will discuss Earth's atmosphere and how it affects astronomy.

Erika Rix: Author of two books on astronomical drawing (Springer) and Astronomy Magazine columnist and astronomical artist. She will speak about astronomy from an artist's perspective.

Dave Moody: Fellow of the Royal Astronomical Society. Dave will speak about the astronomical literary treasures at the FRAS library in England.

Larry Mitchell: Noted amateur from the Houston Astronomical Society, creator of the **Mitchell Anonymous Catalog** available in the databases in Willman-Bell's **MegaStar** high end expert astronomers' planetarium program. He will speak about deep sky wonders.

Lonnie Wege: Celestron regional sales representative. Lonnie will discuss how entry level astronomers can get the most bang for their buck.

Mike Young: from Southwest Research Institute, will talk about his adventures building instruments for the Juno and Pluto New Horizons missions.

William Bucklew: will talk about experiences at Lowell Observatory.

Lauri Allai: from Austin will talk about her astrophotography adventures with a Starizona HyperStar.

Robert Reeves: Noted astrophotographer and author from San Antonio will talk about observing and understanding the Moon.

Mike Simmons: will discuss *Astronomers without Borders*.

Aaron Clevenson: will discuss Supernova 2014J.

In addition to the above, there will be a number of speakers from the Association of Lunar and Planetary Observers.

Don't forget to register for the 31st Annual Okie-Tex Star Party!

September 20-28, 2014

Camp Billy Joe, Kenton, OK

Offering the most wonderful dark skies you'll ever see!

Hosted by our friends, the Oklahoma City Astronomy Club

With wonderful food by Jody's Catering of Boise City, OK!



www.okie-tex.com

Pre-Registrations must be submitted by no later than September 1, 2014

Meal Registrations must be submitted no later than August 29, 2014

Both the Star Party registration and the meals registration forms are available on the website.

Make your registration today, and we hope to see you there!



President's Message

By Mandy Nothnagel

Hello Everyone!

I know the last few months have seemed a little slow due to the weather, but I can assure you that there is always a lot of activity going on behind the scenes!

One major project that is in the works is that we are speaking with the land owners to purchase the land our observatory sits on. We want to protect our investment and make sure that we have full control of our precious site in case the current ownership changes for any reason. We will have more information about the purchase and will send an email to the membership within the next few months. We will vote on the purchase at the Annual Banquet on November 7th.

We had a Board Meeting yesterday and James, our observatory facilities manager, announced some great news- we will have Wi-fi at the observatory within the next few months! He has been working very diligently to get our observatory in top shape and make it high tech. The Wifi is being donated by a very generous donor and will be operational within the next few months. Once the wifi is installed, we will install our security system and begin planning remote observatory control. We hope to one day be able to live stream the views through our telescope in the dome via our website, but that's still at least a year away.

We set a series of dates for our next Observatory Appreciation Days: June 27th, 28th, and possibly the afternoon of the 29th. During these Observatory Appreciation Days, club members get together to give the observatory a little TLC, socialize, and share some of our favorite recipes via a pot luck. If the weather is favorable those nights, we will also stay for a rewarding observing session. Luckily, most of the cleaning was finished last month so we will only need to focus on preparing the walls to be painted (and hopefully getting them painted as well). Our observatory is our largest and most valuable investment and we want to keep it in great shape! Because June 27th is our scheduled Members' Night, we will only use it for an Appreciation Day if the weather is not favorable for observing. I encourage to come out and join us! We'll have music, food, and great people to visit with!

Lastly, I am excited to announce that we have teamed up with the Tulsa Air and Space Museum for the International SUNday on Saturday, June 21st from 1:00-3:00 pm. International SUNday is a worldwide astronomy "holiday" dedicated to our one and only Sun. We will have volunteers outside with solar telescopes, presentations, have handouts related to the club and the Sun, as well as to be there answering questions. This is a great opportunity to increase community awareness of our club. We will arrive around noon to set up and should be finished by about 3:30 pm, depending on the crowds. If you would like to volunteer, please contact Richard Brady at astrotulsa.vp@gmail.com.

We are always looking for ways to improve the club and our events. If you have any ideas, concerns, or suggestions, please contact me and I would be happy to consider them confidentially!

As always, I would like to thank each of our officers, board members, and volunteers for all of their hard work. This club would not function without your continuing dedication!

Hopefully I will see you at one of our events this month! Hopefully Mrs. Mother Nature will be more sympathetic this month and give us some clear nights!

Clear Skies,
Mandy Nothnagel
Astronomy Club of Tulsa President



Treasurer's and Membership Report

By Tim Davis

Astronomy Club of Tulsa: 127 members, including 25 new members in 2014.

Welcome to our new members this month: Phil Baker, Reygan Braga, JJ Burnam, Rebecca Foster. Tonya Hart and Kimber Nottingham.

Club Accounts as of May 29, 2014:

Checking: \$ 5,423.76

Savings: \$ 2,769.49

Investment accounts: \$ 19,001.25 (*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.

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 per year, includes Astronomical League Membership.

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

Students: \$30 with League membership; **Students: \$25** without League membership.

Additional Family membership: \$20 with voting rights and League membership.

\$15 with voting rights but without League Membership.

The regular membership allows all members in the family to participate in club events, but only **ONE** Voting Membership and one Astronomical League membership.

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

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

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

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

Sky & Telescope is \$ 33 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.



The Secretary's Stuff

By Tamara Green

ASTRONOMY CLUB OF TULSA – MINUTES – GENERAL MEETING MAY 9, 2014

PRESENT:

Richard Brady, VP

Tamara Green, Secretary

Tim Davis, Treasurer

John Land, Board

Skip Whitehurst, Board

Stan Davis, Board

NOT PRESENT:

Mandy Nothnagel, President

Lee Bickle, Board

Michael Blaylock, Board

James Taggart, Board

Christopher Proctor, Board

The meeting was held at Tulsa Community College Northeast Campus and there were 21 attendees.

WELCOME AND INTRODUCTION: VP Richard called the meeting to order at 7:02 PM. President Mandy was out of town. He welcomed all attendees. Clay had a video of the lunar eclipse, which was shown for us. He then talked about the Observatory Appreciation Day and thanked those who attended.

PROGRAM: Skip Whitehurst gave a presentation on his recent trip to Chile. Following that, John Land gave a presentation on Astronomy Day (May 10, 2014) and the new meteor shower from Comet 209P/LINEAR on May 24, 2014. This information was found on SpaceWeather.com. The meteors will be coming from the constellation Camelopardalis. John will send a link out before then. He then showed us the webpage for the AL Meteor Observing Program.

OFFICERS'/STAFF REPORTS:

PRESIDENT – Not present.

VICE PRESIDENT – Richard talked about the possibility of the Club purchasing the land our observatory sits on, including our roadway. When he asked if anyone had any objections, nobody objected, but Skip suggested not buying the road due to liability in the event of an accident, saying we can get an easement. He also talked about the Club getting a mount for smartphones to take pictures through the telescope. The Club will also be paying the AL dues soon.

SECRETARY – Tamara told the membership that if anyone wanted to see any of the minutes from Club meetings to contact her; she also, as Newsletter Editor, gave a Call for Articles for the June Newsletter, due to be out on or near June 6. She also said that she would send another call via the Yahoo! Groups and the Club Facebook page.

TREASURER – Tim said we are doing fine financially, we have around 120 members and are holding steady. He welcomed guests and encouraged them to fill out a guest form.

GROUPS – Mandy not present. We have a group coming out May 24 at 8:30 PM to the Observatory, Holy Family Cathedral. There will be at least 25 attendees. The ORU Summer Science group is coming out on Monday, June 9 at 8:15 PM, with Tuesday, June 10 as the backup. Richard then went over other upcoming events since this is the last General Meeting until September 5 at 7:00 PM. He also announced that starting in September we will be having our public nights on Saturdays instead of Fridays.

The Secretary's Stuff, Ct'd.

FACILITIES –James not present. Richard talked about what was done at the work day.

PR/OUTREACH/SIDEWALK – Tamara announced the Sidewalk event, to take place on Sat, May 10 at 7:30 PM (or earlier if you are interested in doing solar observing, at about 4:00 or 5:00) at Bass Pro, weather permitting.

OBSERVING – Tamara told the attendees that if anyone has completed an AL program they are welcome to submit their paperwork to her or Richard and she or he will send it in so they can receive certificates and pins.

Being no other business, meeting was adjourned at 8:50 PM

Synopsis of the Board Meeting Minutes Jun 7, 2014:

Meeting was held at OSU/Tulsa.

Present: Mandy Nothnagel, President; Richard Brady, VP; Tamara Green, Secretary; Tim Davis, Treasurer; Lee Bickle, Michael Blaylock, Stan Davis, John Land, Christopher Proctor, James Taggart, Board; Jennifer Jones, Webmaster.

Not Present: Skip Whitehurst, Board.

The lease for the land does not expire until 2092. The board is making plans to possibly buy the land the observatory sits on outright; a committee consisting of Tamara, John, Richard and James will get with the owners of the land to discuss purchase price and offers. We will present to membership for a vote once we get everything squared away.

Christopher is getting with a lady who can re-do our telescope cover by adding vents in it, to prevent moisture and mold on the telescope. James will get a dehumidifier for the dome.

There will be a few more "Observatory Appreciation Day", scheduled for Saturday, June 28 and Sunday, June 29, and they will both start at 9:00 AM. We will possibly have another work session on Friday, June 27 if the weather is too cloudy for observing. We will spend one or two sessions preparing the interior walls for painting (scraping, washing) and a session painting. We will also be getting free Wi-fi for the observatory soon, and get our dome cable replaced. We will also have security cameras. We are still looking for a mason who can replace the cinder blocks on the West wall of the building. We should try to have the road re-paved within 2 to 3 years, and Christopher will get an estimate on sealant for the road.

James and Christopher will get a tow-behind (to be pulled behind the mower) spreader and bug killer granules for \$150.00. The board agreed on this.

Jennifer is going to put a graphic link to our Café Press online store on our website, add a "Donate" button, put the Yahoo! Groups link in as part of a drop-down menu under the Members login tab, and create forwarding accounts for Club officer email addresses.

Tim went over the financial report. We are good financially, and have a couple of expenses coming up. They are our Astronomical League dues (about \$600) and Insurance payment (\$2,500). Our post office box is paid for for another 6 months. We have 125 members at present. We discussed ideas for fundraisers. We also discussed ideas for member retention, including events for new members.

Upcoming special events that are scheduled are: International SUNDAY at TASM, on Saturday, June 21 from 1:00 to 3:00 PM; Members' Night on Friday, July 25, and a cookout/potluck on Saturday, July 26. Public Nights have been moved from Fridays to Saturdays and will begin 30 minutes before Sunset.

On the subject of religion debate, Mandy referred to our By-laws, where it mentions our Purpose. Basically, we are a science club, dedicated to science and science education, and we do not promote religion.

The Secretary's Stuff, Ct'd.

On the subject of groups, we have the ORU Summer Science group coming to the observatory on Monday, June 9, with Tuesday, June 10 as the back-up night. We have 6 volunteers, but more are needed.

The Starlight Bands organizers have not yet contacted us, and the venue for the concerts has changed. They will now be at the Guthrie Green. Anyone who wishes to contact them to see if they want to do anything with us again this year needs to contact Mandy.

On the subject of elections, the elections of officers and board are supposed to take place in October, but due to low attendance the past couple of Octobers, and much higher attendance at our November dinner meetings, Mandy asked if we could just do the elections in November. Per the ensuing discussion, we would have to announce the change at the September general meeting and possibly amend the By-laws.

Due to the lack of time, other topics that were planned were tabled until the next board meeting.

A Night Sky Photo from the Texas Star Party

by Stan Davis

Below is a beautiful photo taken of the skies over the Texas Star Party by Stan Davis! Says Stan, "Just spent a week at the Texas Star Party on the Prude Ranch in Fort Davis Texas. I highly recommend this to everyone. If you have not heard about this event, you need to Google it and see what it is all about. It is one of the premier Star Parties in the States. This year about 450 people attended from all over the United States, a couple for UK, some from Canada and a young man from India.

If you like dark skies here is a good place in the shadows of McDonald Observatory. Put this on your bucket list.

I posted a picture out on the group photo's to show you what the skies are like. This is an untouched photo, taken with a Canon 70D camera, ISO 1600, f3.5 for 2 minutes. Using a tripod and a Vixen Polaris Star Tracker mount.



NITELOG - Norway InTErurban Local Observing Group

By Tom Hoffelder

It's June! It doesn't get dark! Well, OK it doesn't get dark, per the objects spreadsheet for new moon Saturday, until 11 PM up here in the Maine north woods. And the darkness ends only 3.5 hours after that! If you are in Florida, say somewhere around Yeehaw Junction for instance, it's 10 PM and 7 hours of darkness. Big difference!

OBSERVING: Nothing scheduled for the Twitchell Observatory (it doesn't get dark!) but those of you in Toland CT need to check out something that is being planned for the 21st. And it includes pizza!

COMETS: Maybe three comets ranging from 8th to 9th mag by month's end. Maybe, since only my favorite comet info source has anything about that UQ4 thing. The current PanSTARRS is rather nice, displaying an obvious tail in medium size scopes.

PLANETS: It's all about Saturn! Rings are tilted 20 degrees; it transits (low in Libra) around 10 PM mid month, so this is the month!

STARS: The three carbon stars are the same as the ones last month, because this section of the sky is lacking in these objects. Eight doubles are listed, of varying separations and magnitudes. Not the first one listed is a binocular object.

THE GOOD STUFF: Mostly galaxies, since we are still in Virgo/Coma, but now since we are on the eastern edge of that area, three globulars have snuck in, one of them being one of the best. There are seven Messier Objects and 14 Herschel 400 Objects. Then there is NGC 4884, a giant elliptical 250,000 light years across, sending us light that takes 300 million years to get here, along with light from a whole bunch of other smaller galaxies. How many can you see in your scope?



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.*



M64 15' FOV



NGC 4762/54 20' FOV



M63 15' FOV



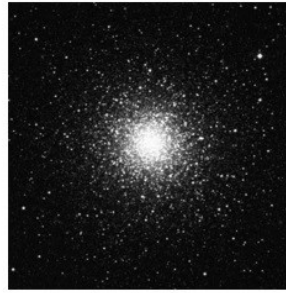
NGC 5170 15' FOV



M51 15' FOV



M83 15' FOV



M3 15' FOV



M101 30' FOV

Comet	RA	Dec	Star	N/S	E/W	N-S/ day	E-W/ day	Mag ¹	Ura no I	Alt ²	Date	EDT
2012 K1 Pan- STARRS	10 43.2	+41 49	μ UMa	0.3 N	3.9 E	0.4 S	0.6 W	8.6	72	44	6/1	23:00
2012 X1 LINEAR	22 16.4	-20 06	δ Cap	4.0 S	6.5 E	0.4 S	0.2 E	8.5	347	15	6/2	03:30
2012 K1 Pan- STARRS	09 58.5	+33 06	μ Leo	7.1 N	1.1 E	0.4 S	0.3 W	8.3	104	29	6/21	22:00
2012 K1 Pan- STARRS	09 49.2	+30 17	μ Leo	4.3 N	0.9 W	0.4 S	0.2 W	8.2	104	21	6/28	22:00
2013 UQ4 Catali- na	00 25.9	+21 58	α And	7.1 S	4.2 E	2.3 N	1.2 W	8.5	126	~20	6/29	02:00
2012 X1 LINEAR	22 32.8	-31 10	β PsA	1.1 N	0.3 E	0.3 S	---	9.0	384	13	6/29	03:30

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

²Maine, at time noted

6/21			6/28			6/29		
SS	NTE	ATE	MR	SS	MS	NTE	ATE	ATB
20:29	21:54	22:56	01:54	20:30	21:07	21:54	22:56	02:36

Object (Type)	RA	Dec	Star	N/S	E/W	Mag*/(# of Stars)	Size (')/ Sep ('')	Spect/ M# or	Dist (ly)	Urano I Page	Comment, [B-V], {~cmt mag} (opt x)
SS Vir (CS)	12 25.2	+00 46	η Vir	1.4 N	1.3 E	6.0-9.6		CII		238	[3.9] {7}
Y CVn (CS)	12 45.1	+45 26	α CVn	7.1 N	1.9 W	5.0-6.4		Clab		75	[3.2] {5.5}
RY Dra (CS)	12 56.4	+66 00	κ Dra	3.8 S	2.2 E	6.0-8.2		C		26	[3.6] {7}
32+33 Com (MS)	12 52.3	+17 05	24	1.3 S	4.2 E	6, 6.5	195	gM0, F8		149	(3)
α CVn (MS)	12 56.0	+38 19	-	-	-	3, 5.5	20	A0, F0	120	109	(24)
25 CVn	13 37.5	+36 18	PRV	2.0 S	8.5 E	5.5, 7.5	1.8			109	(420)
0ΣΣ125	13 47	+36 36	PRV	2.3 N	1.9 E	6, 8.5	71			110	yellow/blue (10)
ζ UMa (MS)	13 23.9	+54 56	-	-	-	2.5, 4	14	A2, A7	83	48	(55)
θ Vir	13 09.9	-05 32	-	-	-	4.5, 9	7.2			240	GX 4989 0.2 NW
84 Vir	13 43.1	+03 32	ζ Vir	4.2 N	2.1 E	5.5, 8	3.0	K2, dG5		241	(250)
Σ1764	13 38	+02 20	PRV	1.2 S	1.3 W	7, 8.5	16			241	nice color (45)
*NGC 4762 (SB0)	12 52.9	+11 14	ε Vir	0.2 N	2.3 W	[12.9]	8.7X1.7	*H75-2	57M	239	
*NGC 4754 (SB0)	12 52.3	+11 19	PRV	0.1 N	0.2 W	[12.9]	4.4X2.4	*H25-1	57M	239	
NGC 4800 (Sb)	12 54.6	+46 32	α CVn	8.2 N	0.3 W	[12.2]	1.6X1.2	*H211-1	54M	75	
*NGC 4826 (Sab)	12 56.7	+21 41	α Com	4.2 N	3.1 W	[12.7]	10X5.4	M64	17M	149	Blackeye Galaxy
*NGC 4884 (E)	13 00.1	+27 59	β Com	0.1 N	2.6 W	[13.4]	2.8X2.0	---	300M	149	Coma GX Cluster

NGC 4995 (SBb)	13 09.7	-07 50	θ Vir	2.3 S	-	[12.6]	2.4X1.7	*H42-1	90M	285	
NGC 4958 (SB0)	13 05.8	-08 01	PRV	0.1 S	1.0 W	[12.4]	3.9X1.4	*H130-1	78M	285	GX 4948
NGC 5005 (SBbc)	13 10.9	+37 04	α CVn	1.3 S	3.0 E	[12.7]	5.8X2.9	*H96-1	60M	109	
NGC 5033 (Sc)	13 13.5	+36 36	PRV	0.5 S	0.5 E	[14.2]	10X5.0	*H97-1	59M	109	
NGC 5024 (GC)	13 12.9	+18 10	α Com	0.6 N	0.7 E	7.7	13	M53	58K	150	GC 5053 0.4S/0.9E
*NGC 5055 (Sbc)	13 15.8	+42 02	α CVn	3.7 N	3.8 E	[13.2]	12X7.2	M63	26M	75	
*NGC 5170 (Sc)	13 29.8	-17 58	α Vir	6.8 S	1.1 E	[13.5]	8.2X1.0	*H22-5	82M	285	
*NGC 5194 (Sbc)	13 29.9	+47 12	η UMa	2.1 S	3.0 W	[12.7]	11X6.9	M51	26M	76	Whirlpool Galaxy
NGC 5195 (SB0-a)	13 30.0	+47 16	PRV	0.1 N	---	[13.0]	5.9X4.6	*H186-1	26M	76	
*NGC 5236 (Sc)	13 37.0	-29 52	π Hya	3.2 S	6.3 W	[12.8]	13X11	M83	16M	371	
*NGC 5272 (GC)	13 42.2	+28 23	β Com	0.5 N	6.6 E	6.3	18	M3	34K	109	
NGC 5466 (GC)	14 05.5	+28 32	PRV	0.1 N	5.1 E	9.2	9.0	*H9-6	52K	109	
NGC 5273 (S0)	13 42.1	+35 39	20 CVn	4.9 S	4.9 E	[13.5]	2.8X2.5	*H98.1	57M	110	GX 5276 0.1 E
NGC 5322 (E2)	13 49.2	+60 11	α Dra	4.2 S	1.9 W	[13.6]	6.0X4.1	*H256-1	90M	27	
*NGC 5457 (Sc)	14 03.2	+54 21	ζ UMa	0.7 S	5.8 E	[14.6]	27	M101	21M	49	
NGC 5473 (E/	14 04.7	+54 54	PRV	0.5 N	0.2 E	[12.9]	2.2X1.7	*H231-1	108M	49	
NGC 5474 (Sc)	14 05.0	+53 40	M 101	0.7 S	0.3 E	[13.8]	4.7	*H214-1	21M	49	

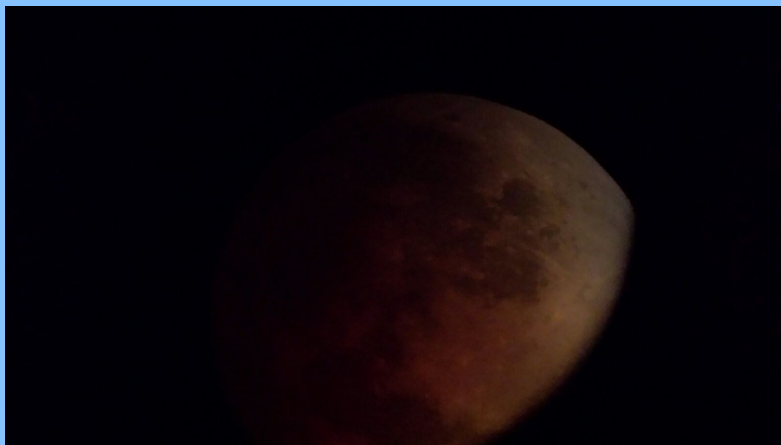
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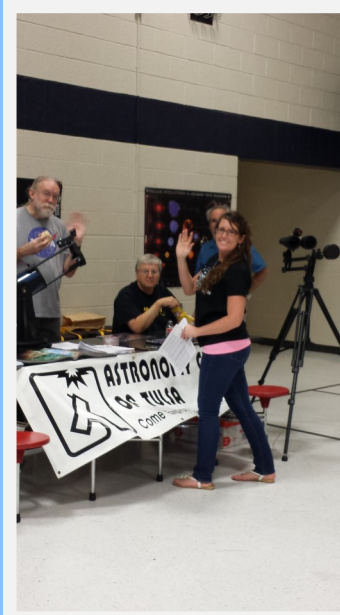
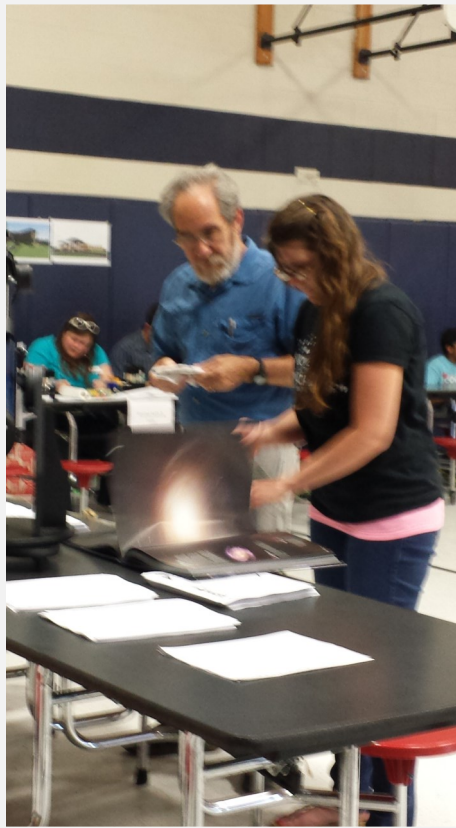
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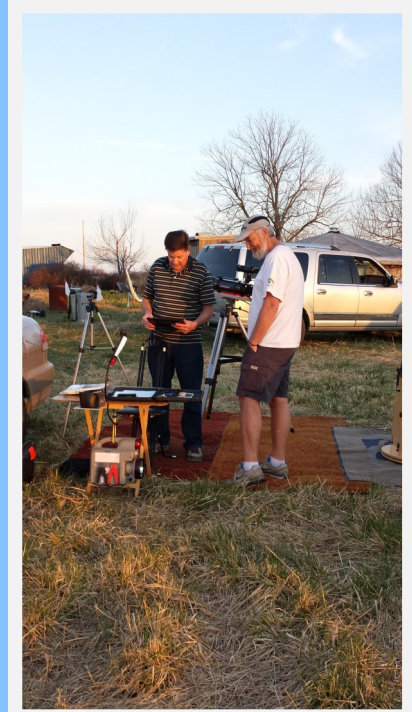
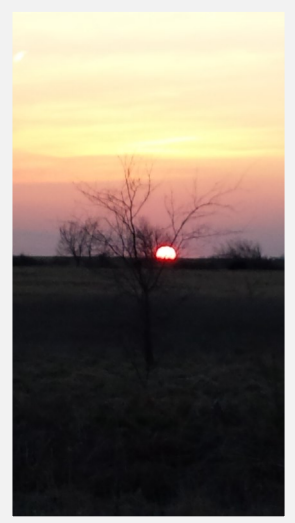
Some Nice Lunar Eclipse Pics, by Ed and Deana Underhill!



Some Group and Sidewalk Astronomy Pics, by Ed and Deana Underhill!



Some Messier Marathon Pics, by Ed and Deana Underhill!



The Hottest Planet in the Solar System

By Dr. Ethan Siegel

When you think about the four rocky planets in our Solar System—Mercury, Venus, Earth and Mars—you probably think about them in that exact order: sorted by their distance from the Sun. It wouldn't surprise you all that much to learn that the surface of Mercury reaches daytime temperatures of up to 800 °F (430 °C), while the surface of Mars never gets hotter than 70 °F (20 °C) during summer at the equator. On both of these worlds, however, temperatures plummet rapidly during the night; Mercury reaches lows of -280 °F (-173 °C) while Mars, despite having a day comparable to Earth's in length, will have a summer's night at the equator freeze to temperatures of -100 °F (-73 °C).

Those temperature extremes from day-to-night don't happen so severely here on Earth, thanks to our atmosphere that's some 140 times thicker than that of Mars. Our average surface temperature is 57 °F (14 °C), and day-to-night temperature swings are only tens of degrees. But if our world were completely airless, like Mercury, we'd have day-to-night temperature swings that were *hundreds* of degrees. Additionally, our average surface temperature would be significantly colder, at around 0 °F (-18 °C), as our atmosphere functions like a blanket: trapping a portion of the heat radiated by our planet and making the entire atmosphere more uniform in temperature.

But it's the *second* planet from the Sun -- Venus -- that puts the rest of the rocky planets' atmospheres to shame. With an atmosphere **93 times as thick as Earth's**, made up almost entirely of carbon dioxide, Venus is the ultimate planetary greenhouse, letting sunlight in but hanging onto that heat with incredible effectiveness. Despite being nearly twice as far away from the Sun as Mercury, and hence only receiving 29% the sunlight-per-unit-area, the surface of Venus is a toasty 864 °F (462 °C), with *no difference* between day-and-night temperatures! Even though Venus takes hundreds of Earth days to rotate, its winds circumnavigate the entire planet every four days (with speeds of 220 mph / 360 kph), making day-and-night temperature differences irrelevant.

Catch the hottest planet in our Solar System all spring-and-summer long in the pre-dawn skies, as it waxes towards its full phase, moving away from the Earth and towards the opposite side of the Sun, which it will finally slip behind in November. A little atmospheric greenhouse effect seems to be exactly what we need here on Earth, but as much as Venus? No thanks!

Check out these "10 Need-to-Know Things About Venus":

<http://solarsystem.nasa.gov/planets/profile.cfm?Object=Venus>.

Kids can learn more about the crazy weather on Venus and other places in the Solar System at NASA's Space Place: <http://spaceplace.nasa.gov/planet-weather>.

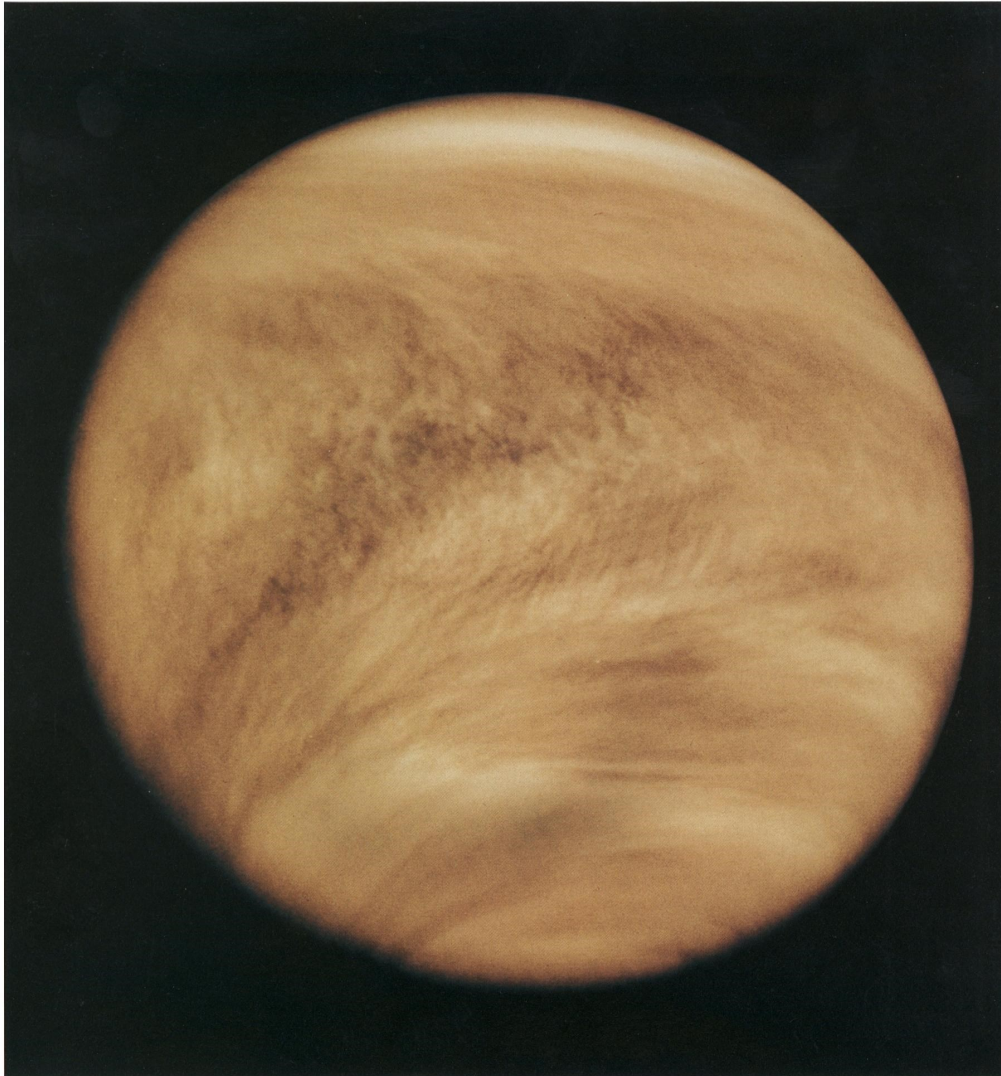


Image credit: NASA's Pioneer Venus Orbiter image of Venus's upper-atmosphere clouds as seen in the ultraviolet, 1979.



the Space Place

May – June 2014 / Vol. 7, Issue 3

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.

*Not only is the Space Place constantly developing brand-new content, we also make sure to keep our existing products as up-to-date and as exciting as possible. Nowhere is this clearer than in our educational mobile game development. In the past couple of months we have updated our classic games *Satellite Insight* and *Comet Quest*, and our magazine-style app *Space Place Prime*. *Comet Quest* is now as exciting as ever with all-new game play. We have expanded our reach by releasing *Space Place Prime* for Android devices, and all of our products are now compatible with iOS7. The new updates of *Comet Quest* and *Satellite Insight* now include access to Apple's Game Center. See how well you stack up against players from around the world!*

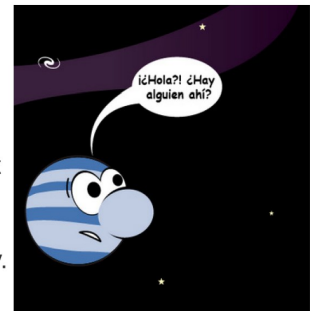
What's New? Craters!



Ever stop to think about how many craters are on the Moon? Do you wonder why Earth hasn't suffered a similar scarred fate? It's a good mystery to puzzle about, and can lead to some excellent classroom science discussions. A new page on Space Place answers this quandary with its usual dose of fun and humor. Check it out at <http://spaceplace.nasa.gov/craters>.

Space Place en Español

We are constantly adding our newest content to Space Place en Español, but we've added even more to the site recently. Our popular new pages "The Lone Planet," "What is a Planet," "A Solar Mystery," and our new activity "Build a Spacecraft" are all available on the Spanish language site. Check them out at <http://spaceplace.nasa.gov/sp/>.



Spotlight on Game Center



The Space Place team is proud to announce that we are one of the first NASA groups to release mobile games that are compatible with Apple's Game Center app. This app, which works with both *Comet Quest* and *Satellite Insight*, allows you to compare scores with anyone else in the world. How do your scores measure against friends, strangers, and high-scorers. Who knows? Maybe you can set the highest score in the world. You'll have to beat us first, though... Check out our mobile games at <http://spaceplace.nasa.gov/ios>.

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

For the Classroom



It's that time of year again—Space Place calendar time, that is! We've just released the most recent edition of our hit calendar. Perfect for the classroom, this June 2014-June 2015 calendar comes complete with fun science facts, historical notes, and beautiful images. Can't wait until then? Don't worry, we still have the remaining

months of last year's calendar ready to download as well. Spice your classroom up today! Download at <http://spaceplace.nasa.gov/calendar>.

For Out-of-School Time



With summer fast approaching, now might be a good time to get your wardrobe in order. Why not create your own fashionable summer wear this year? Space Place can help you out. We've got a printout t-shirt design that can be ironed on to the shirt of your choosing. What better way to tell the world that you are both stylish and science savvy than with a Space Place t-shirt? Check it out here: <http://spaceplace.nasa.gov/t-shirt>.

Special Days

May 2 - The first commercial jet flight takes place, 1953. Why do we need rockets? Can't an airplane just keep going into space? <http://spaceplace.nasa.gov/dr-marc-technology>.

May 6 - National Space Day. Build your own satellite to celebrate! <http://spaceplace.nasa.gov/build-a-spacecraft>.

May 18 - Eruption of Mount St. Helens, 1980. It was a pretty impressive volcanic eruption. Does anything like that happen on other planets? <http://spaceplace.nasa.gov/volcanoes>.

May 26 - Birthday of Dr. Sally Ride, 1951. She was the first American woman in space. Women do all kinds of important work at NASA. <http://spaceplace.nasa.gov/space-place-live>.



June 5 - World Environment Day. Take a look at Earth's many environments. <http://spaceplace.nasa.gov/gallery-earth/geography>.

June 13 - The first roller coaster opens, 1884. How does a roller coaster work? Build a "Newtonian Physics Machine" and find out. <http://spaceplace.nasa.gov/momentum>.

June 30 - A comet or asteroid explodes over Siberia, 1908. Do comets or asteroids do more than explode or kill off dinosaurs? <http://spaceplace.nasa.gov/comet-ocean>.

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 your ideas about ways to use NASA's Space Place in your teaching. Send to info@spaceplace.nasa.gov.



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:

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/>



The General Meetings are free and open to the public.

We hope to see you there!

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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





Photo: Parade of The Stars of the Summer Milky Way,, by Tamara Green.

THE ASTRONOMY CLUB OF TULSA INVITES YOU TO MAKE PLANS THIS SUMMERTO 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.

