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ASTRONOMY CLUB OF TULSA

OBSERVER

FEBRUARY 2016



PHOTO: A beautiful image of Comet Catalina, taken at the Astronomy Club of Tulsa Observatory on Jan. 30, 2016. Photo details: Comet C/2013 US 10 (Catalina); 100mm f/2.8; ISO 3200; 30 second exposure; 20160131 03:05 UTC; Single Frame. **Photo by Skip Whitehurst.**

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THE ASTRONOMY CLUB TULSA IS A PROUD MEMBER OF



THE ASTRONOMICAL LEAGUE



PHOTOS: Five Planets in the January Sky! Clockwise, from top left: Mercury and Venus; Antares and Saturn; the Moon and Mars; Jupiter. Taken in Midtown Tulsa in the early morning of Jan. 31, 2016. **Photos by Tamara Green.**

FEBRUARY 2016

MOON PHASES AND HOLIDAYS:

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					

GROUNDHOG DAY TUES FEB 2
 NEW MOON MON FEB 8
 VALENTINE'S DAY SUN FEB 14
 FIRST QUARTER MON FEB 15
 PRESIDENTS' DAY MON FEB 15
 FULL (Snow) MOON MON FEB 22



UPCOMING EVENTS:

MEMBERS' NIGHT**	FRI FEB 5	6:00 PM	ACT OBSERVATORY
GENERAL MEETING	FRI FEB 12	7:00 PM	JENKS HS PLANETARIUM
SIDEWALK ASTRONOMY	SAT FEB 13	6:00 PM	BASS PRO
PUBLIC STAR PARTY	SAT FEB 27	6:15 PM	ACT OBSERVATORY
MEMBERS' NIGHT	FRI MAR 4	6:30 PM	ACT OBSERVATORY
MESSIER MARATHON**	SAT MAR 5	3:00 PM***	TUVA
GENERAL MEETING	FRI MAR 11	7:00 PM	JENKS HS PLANETARIUM
SIDEWALK ASTRONOMY	SAT MAR 12	6:30 PM	BASS PRO
VERNAL EQUINOX/DAYLIGHT SAVING TIME BEGINS			SUN MAR 13
PUBLIC STAR PARTY	SAT MAR 26	7:30 PM	ACT OBSERVATORY

MEMBERS AND FAMILY ONLY PLEASE. *SEE INFO ON CARAVAN TO MESSIER MARATHON ON PAGE

MARCH 2016

MOON PHASES & HOLIDAYS:

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		

LAST QUARTER TUES MAR 1
 NEW MOON TUES MAR 8
 FIRST QUARTER TUES MAR 15
 FULL (Worm) MOON WED MAR 23
 GOOD FRIDAY FRI MAR 25
 EASTER SUN MAR 27
 LAST QUARTER THUR MAR 31



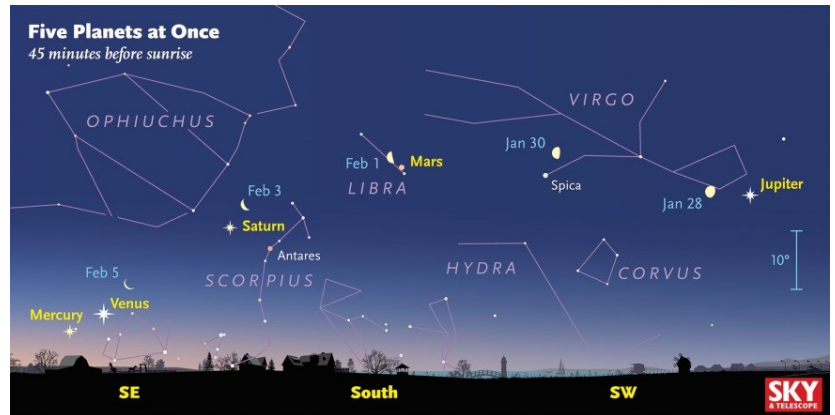
PRESIDENT'S MESSAGE

BY RICHARD BRADY



Hi everyone!

Right now if you go out before sunrise, look southeast to southwest, and you should be able to see all 5 naked-eye planets. Mercury, magnitude around +0.2, will be the hardest to spot (as usual) low in the southeast. (It is near Pluto, but you need a big telescope and dark skies to spot Pluto.) Mercury is to the lower left of bright Venus, magnitude -4.0. Then view Saturn at magnitude +0.5, red Mars at +0.9, and finally giant Jupiter at magnitude -2.4 in the southwest. The moon will be passing through this grouping through Saturday, February 6. A couple of members have already reported seeing all five. (The diagram is for February 1st.)



One of the items on the survey we had at the annual dinner suggested we should look into trying to get some grants for a new dome for the observatory, a new building to house club telescopes for members to use at the observatory, acquiring land for a new dark site. The board formed a committee to look into this. The members of the committee are James Liley, James Taggart, Skip Whitehurst, board members, and Marilyn Leaman, associate member.

Another thing on the survey was to look for a new dark site. If we go ahead with getting a new site, we would keep the current site for Public Nights and have the dark site for members. If you have been out to our current observatory, you can't have missed the light pollution encroaching from just about every direction.

Skip Whitehurst and I went looking for a dark sky site south of Bristow along Highway 48. The area about 15-20 miles south near Welty and Mason is quite dark. This is within a one hour drive from downtown Tulsa. There was only minimum sky glow (less than 15 degrees up) from both the Tulsa area in the northeast and OKC area in the southwest. If we get serious about getting a new site this would definitely be a place to consider. If you want to look at a dark sky map, go to <http://darksitefinder.com/maps/world.html> and zoom in on northeast Oklahoma. The areas marked in blue and gray are the darkest areas. Near Tulsa there is only one south of us and still north of I-40, where Skip and I went. There are also a couple to our northeast (east of Nowata on Highway 60) and to our northwest near Hulah Lake and the Tall Grass Prairie.

Ron Wood of TUVVA will speak at our February General Meeting. He will be talking about the history and dynamics of lunar recession, and about the Messier Marathon. The Messier Marathon is scheduled for the weekend of March 5, with the weekend of April 9 as back-up. Tamara Green will lead us down to TUVVA again this year.

The transit of Mercury is coming up Monday, May 9 from 6:12 AM (9 minutes before sunrise in Tulsa) to 1:42 PM. The club will be hosting an event at the Jenks Planetarium. Anyone who can come and help out will be greatly appreciated.

Clear Skies!
Richard Brady

TREASURER'S AND MEMBERSHIP REPORT

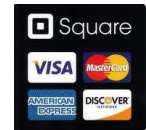
BY TIM DAVIS



Astronomy Club of Tulsa: 159 members, including 4 new members in 2016.

Welcome to our new members this month:

Tyler Watson, Thomas Owen, Jamie Arnett and Ed Haskell.



Club Accounts as of January 31, 2016:

Checking: \$6,018.38; Savings: \$4,775.20; Investment accounts: \$17,538.39 (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. 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 2016 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 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.

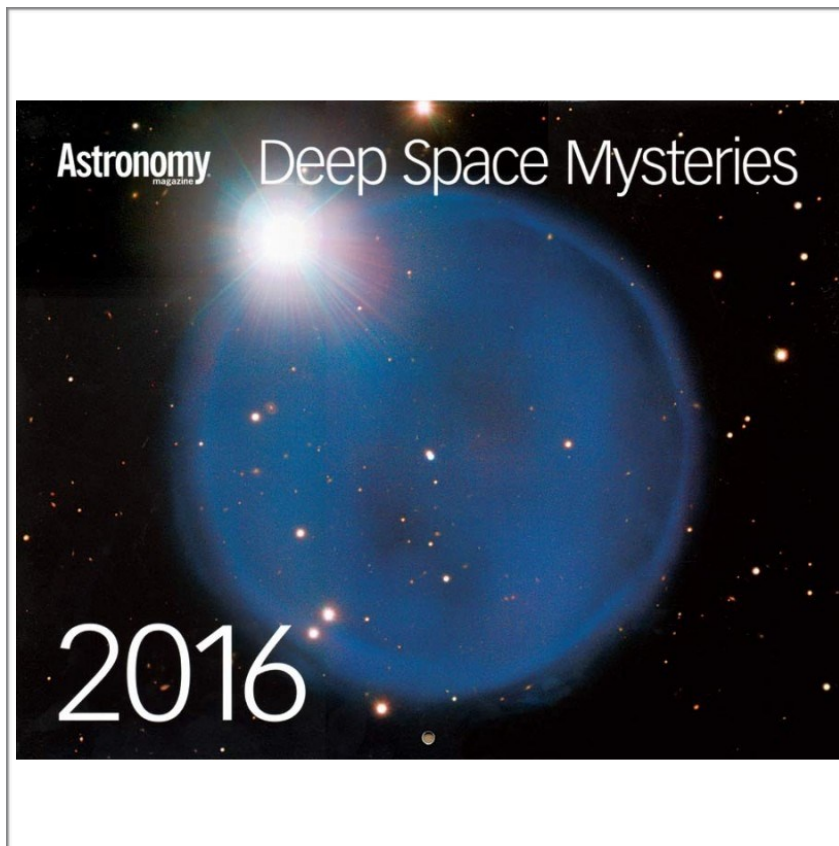
NEW SUBSCRIPTIONS must still be sent to the club

2016 Wall Calendar

The 2016 Astronomy Magazine Wall Calendars are here and are now available. If you would like to reserve one, send me an email at astrotulsa.tres@gmail.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 still have some available for \$8.00 each, cash, check or credit cards accepted.

Calendars must be picked up in person at a club event, we can not ship these to you. If you reserve one, just let me know at which event you will pick it up.

Get yours while they last!



Tim Davis

Act Treasurer

SECRETARY'S CORNER

BY TERESA DAVIS



Friday, January 22, 2016

ACT Public Meeting @ Jenks Planetarium

Richard stated the meeting at 7:05pm with 28 members and visitors.

The meeting began with the planetarium view of the planets as they will appear just before sunrise in the next week.

Our President, Richard Brady, presented slides which included the following:

Major Meteor showers in 2016 were posted on a chart, New Pluto stamp that should be out by next May, and a reminder about the survey from last November: Looking for grant money.....

A committee has been formed to look into getting a grant. One of the ideas included was looking for dark sky sites. Skip Whitehurst and Richard visited a site south of Bristow at night to view the dark skies.

They went to an area shown on a dark site coded map at a place marked Welty. It takes about 50 minutes from down town Tulsa. Next, we were shown A Dark Sand Dune on Mars taken by Curiosity last month.

Richard also shared current news: The Ninth Planet? Not Pluto, Not a dwarf planet, but another object may be the reason for the orbits of the 6 most known objects past Pluto. Also in the news: Brightest Supernova Baffles Astronomers, Giant Supernova ASASSN-15lh 200 times as bright as a typical Type 1A Super Novae. ISS Transits Saturn, Richard shared a video clip of the transit.

John Land gave information on Comet Catalina, Currently in Draco, the comet came closest to earth On Jan 17, 2016. John says it is between the handle of the big dipper and Draco.

Richard explained that we have plans for our public meetings for the rest of winter and into the spring:

Feb 12 Ron Wood will give a talk about the Moon.

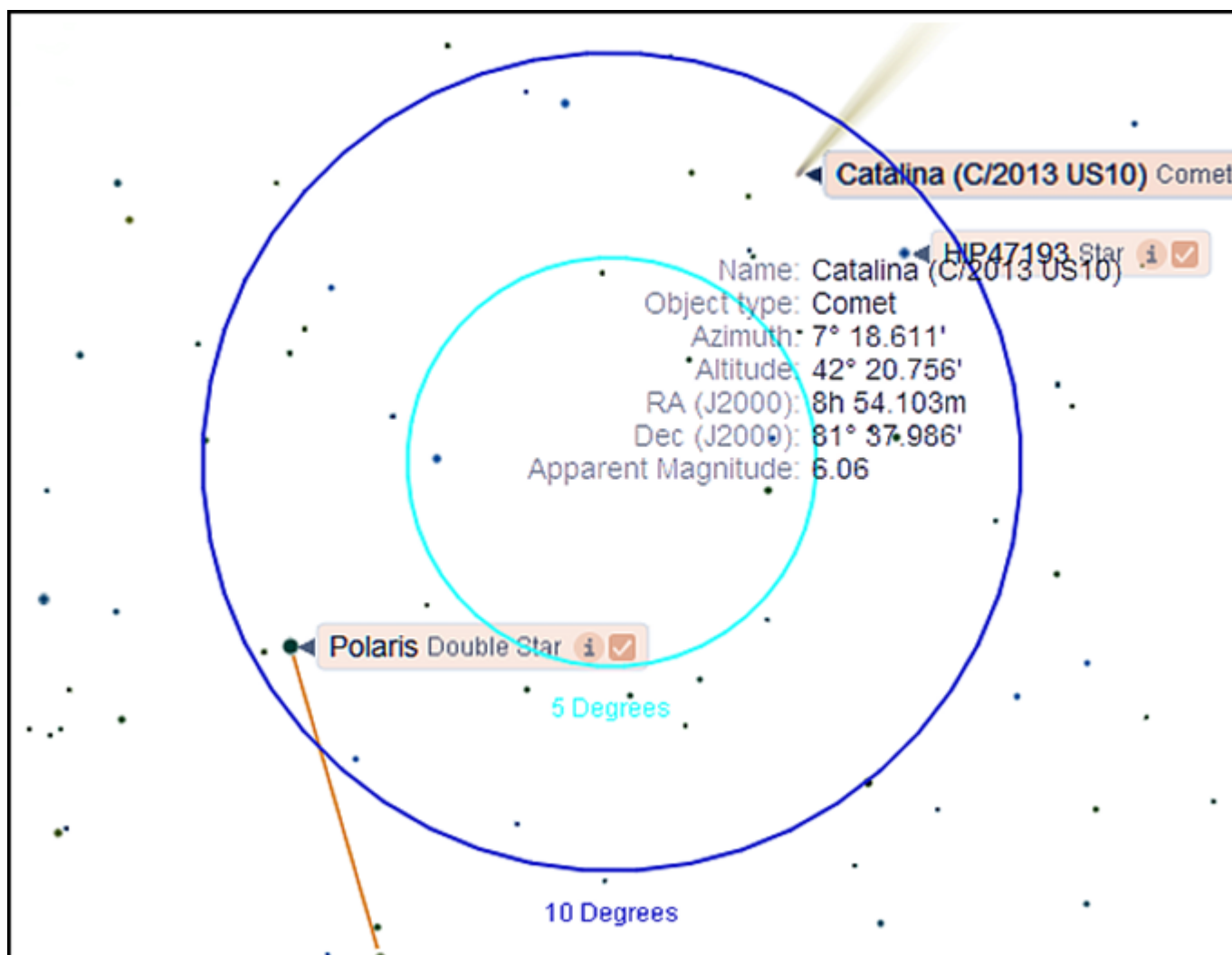
Other Astronomy events coming up: There will be a Bartlesville Astronomy Club event, Monday Feb 1 at 7pm on Astrophotography at the Bartlesville public Library. Volunteers are needed for Tuesday, April 12: How to use your Telescope at the Jenks Planetarium. Monday May 9th Transit of Mercury. Starts at 6:12am ends 1:42PM. See the list of Planetarium Shows every Tuesday at 7pm found on the events list of the Jenks Community Education website.

Richard then introduced our NSN Teleconference: Innovative Solar System Science with James Webb Space Telescope presented by Dr. Stefanie Milam. After viewing the video of the teleconference, we were all invited to meet up at Louie's for an after the meeting gathering.

A FINDER CHART FOR COMET CATALINA

SUBMITTED BY JOHN LAND

Below is a finder chart that John Land emailed to me. I thought I would use it in the newsletter, as many of us will be wanting to look for it in the upcoming weeks.



Also, there is a very good article with more finder charts from Sky and Telescope!

<http://www.skyandtelescope.com/observing/comet-catalina-sails-into-northern-skies111120151111/>

IT'S (almost) MESSIER MARATHON TIME!!!

BY TAMARA GREEN



The Astronomy Club of Tulsa and TUVA Astronomy Club cordially invite you to our **MESSIER MARATHON!**

Saturday, March 5, 2016—4:00 PM-ish (Backup date Saturday, April 9)

Caravan to TUVA leaves Burger King, 1600 N. Elm Pl., Broken Arrow at 3:00 pm **SHARP!**

Come join us at our annual Messier Marathon to see how many of Charles Messier's 110 beautiful deep-sky objects you can find on the night of Saturday, March 5! There will be a potluck dinner before dark so you can bring a dish or dessert or beverages to share if you wish. We also plan to take a group photo before the marathoning begins.

Please keep in mind that this is an ALL-NIGHT event and is expected to be cold, so don't let the afternoon temps fool you. You might be in your shorts and t-shirt in the afternoon, but you will need your thermals and parka that night for sure!!! And there should be plenty of coffee to keep us going! (If you have children who are not yet old enough to participate in a Messier Marathon, this would be a good weekend for them to visit Grandma.) Please plan on bringing your cold weather gear.

There will be a caravan going to TUVA. The caravan will be led by Club Vice President Tamara Green. It will meet in the parking lot at the Burger King on North Elm Place (1600 N. Elm Pl.) in Broken Arrow. It is across the street from the Ferguson Kia/Subaru dealership. A map to Burger King is on page 9 of this newsletter. **THE CARAVAN LEAVES BURGER KING AT 3:00 PM SHARP!!!!** This is because it takes about an hour-ish to get to TUVA from Broken Arrow, and we want time to get down there, get set up, and enjoy dinner before dark. So, if you are interested in joining the caravan, please be there **BEFORE 3:00 PM!!** Also, please contact me at astrotulsa.vp@gmail.com and let me know you are joining, and what kind of vehicle you drive so I can keep track of everyone along the way. Please note that the caravan is only going TO TUVA on Saturday but there is no caravan going from TUVA back to town on Sunday, due to people leaving at different times throughout the night and early morning. There is a map to TUVA on page 10 of this newsletter.

Please note that due to limited space at TUVA, this event is MEMBERS ONLY (ACT and TUVA). Thank you for your understanding and cooperation.

In the event of a cancellation due to weather, there will be a contingency plan for that evening, and our backup date for the marathon itself will be Saturday, April 9.

Will YOU be the winner of the David Stine award this year? We look forward to seeing you there!



IT'S (almost) MESSIER MARATHON TIME!!!, CT'D.

BY TAMARA GREEN

Print - Maps

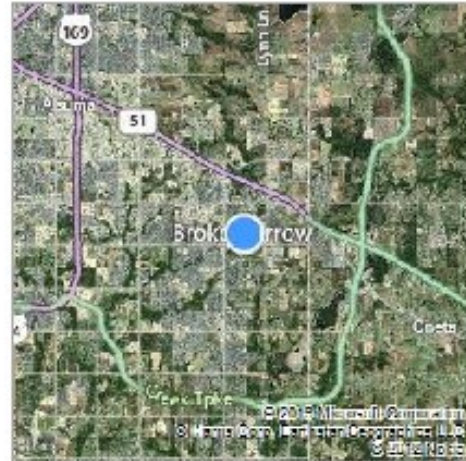
Page 1 of 1

bing Maps

Broken Arrow, OK

Burger King on N. Elm Pl., Broken Arrow. Building is on the Left side the map, blue roof.

On the go? Use m.bing.com to find maps, directions, businesses, and more



<http://www.bing.com/maps/print.aspx?mkt=en-us&z=18&s=h&cp=36.070022,-95.796987...> 2/26/2013

IT'S (almost) MESSIER MARATHON TIME!!!, CT'D. BY TAMARA GREEN

Astronomy Club Of Tulsa - TUVA Observatory - Checotah, OK

1. From the Broken Arrow Expressway going east, exit at 81st St. which is also Highway 51 (last exit before the Muskogee Turnpike).
2. Go about nine miles to Coweta. Watch for Wal-Mart on the left, go under the railroad bridge and through downtown Coweta on Highway 72.
3. Continue on Hwy 72 through Haskell, Boynton, and Council Hill. (Watch speed traps through these little towns).
4. About 3½ miles after you go through Council Hill, Hwy 72 ends. Watch for signs that say this and "Junction 266". To the right is 266 west to Henryetta and straight ahead is 266 to Checotah.
5. At this junction turn left (east) onto a county road.
6. Go ¼ mile to a stop sign, past a white church. Continue two miles east to another stop sign and a white two-story house on your left.
7. Turn left (north) and go ¼ mile to a silver and red gate on your left (west).
8. There is a black mailbox and white Muskogee Phoenix box at the entrance of the site. Turn in and you are at TUVA.

Option: You can also bypass Coweta by going south on Memorial through Bixby, make the big curve to the east and go through Leonard to Haskell and follow the directions starting at step 3.



WONDERFUL LINEUP OF FIVE PLANETS IN THE MORNING SKY

BY BRAD YOUNG

Hopefully, you received the email John Land sent out about the current lineup of 5 planets in the morning sky. John did a much better job of describing the situation than all the media reports I've seen. For instance, the morning of January 22, through the fog I checked on the planet lineup. Four out of five ain't bad, and that's all that it will be practical to see except for a few days early next month from the northern hemisphere. As you will see from observing even the four planets, the associated bright stars, and in a few days the moon, the ecliptic in the winter morning's sky for us is at a very shallow angle. This means that the objects in the East (Saturn, Venus, Mercury) do not rise very high in the sky before twilight begins. Also, Mercury is at its faintest when entering the morning sky after inferior conjunction – where it passes between us and the sun as it just did.



Screen shot from Cartes du Ciel for Feb 1, 2016, at 6:30 am at Tulsa. Note that Pluto will not be visible (but you can imagine it's there, very near Mercury). The moon will be a gibbous waning phase – I see it as a football when it looks like this.

If you do take a look in the morning you will see that moving from west to east the ecliptic (path of the planets) runs from nearly as north as it gets with Regulus and Jupiter in Leo in the west through Spica and Mars in the south. The line continues on to Saturn and Antares in the south southeast to the brightest, Venus, very low in the Southeast. On February 13 Mercury will have moved back as close as it's going to get to Venus and will start racing back toward the sun, ending its apparition for this season. But I would say from experience that you won't have much of a chance to see it until about the first of February, and then up until Valentine's Day.

WONDERFUL LINEUP OF FIVE PLANETS IN THE MORNING SKY

BY BRAD YOUNG, CT'D.

As often happens, the media (unfortunately even some of the astronomy outlets) have latched onto a situation that looks good on paper, but don't have the observing skill or consultant that can explain the practical aspect of seeing this lineup. So, please do look in the morning the next few days, but have realistic expectations. It will afford a great opportunity to see celestial mechanics at work.

PS it was nice to see the Summer Triangle back in the sky, although on such a chilly morning it almost seems to be mocking me. And for the southern hemisphere, the lineup angle is very steep, so they are seeing the planets easily in their summer morning sky before it gets too hot.

CAN YOU NAME A STAR FOR SOMEONE SPECIAL?

BY JOHN LAND



Can You NAME a STAR for someone SPECIAL?

By John Land

With Valentines just around the corner the radio and social media will be full of advertising to “Give the Gift that Shines Forever” NAME A STAR for your special loved one. If you do a Google search you’ll find dozens of websites that purport to let you PAY to name a star for someone special. Prices range from a \$30 to well over \$100.

For your money you’ll generally get some sort of certificate, a star map and some coordinates numbers for a star. Then for EXTRA \$\$ you can buy additional options. One site lets you chose options like picking the constellation you want or even choosing a Binary star to name for “Johnny & Susie”. Another has a “SuperNova” package that includes “Two Acres of LunarLand in your name”. You’ll even find *official* Star registry companies in several different countries. I did a quick search and found them in USA, UK, Canada, Germany, even Australia. Didn’t see one for Antarctica – so maybe you can get in on the action too. The old adage “**if it sounds too good to be true, it probably isn’t**” applies.

The International Astronomical Union is the governing body that recognizes the official names for all astronomical objects. They have some rather stringent rules about what kind of names can be used for particular kinds of objects. **You can’t BUY star names on the Internet, or anywhere else!**

Their advertising will says things like “Your Star Name will be published in a book and REGISTERED in the LIBRARY of Congress” or RECORDED in the “Official Star Registry”. Any book published in the USA can have a listing in the Library of Congress, but it’s the book that has the listing not the star “names” inside of it. They don’t tell you what the “Official Star Registry” is nor who maintains it. One site says your star is “visible from the United States” but doesn’t mention how big a telescope it would take to see it.

So what about paying to name a star for a person. Basically it’s a matter of sentimental value only. A way to let someone know you think they are special or to remember someone who was special to you. It has no status in the scientific world. Sadly most of these companies are just making money off by appealing to your sentiment and lack of knowledge.

I’ve helped people find their “special star” several times. Most people who contact us are young guys wanting to impress a special gal. Others are family members who have lost a loved one. The stars they’ve named are 10th magnitude or dimmer, so it’s not visible except through a telescope, and it takes a pretty good star chart to identify them. Nowadays they may show your star on a computer generated map once you’ve paid for the package. A few years back the charts were pretty crude printouts. Often the star is only visible during certain seasons to be viewed in the evening. My personal opinion is there are better ways to impress your gal; a gift to a charity or medical research would be much better way to commemorate a loved one.

The 7000 or so stars that are visible to the naked eye already have names. The brighter stars have common names handed down from antiquity. Names like Rigel, Sirius, Castor, Pollux and such. Others were named by Arab astrologers, thus we have Altair (eye of the eagle Aquila) and Betelgeuse (shoulder of the hunter Orion). Stars also have Greek letter Bayer names and Flamsteed numbers. So the 2nd brightest star in Orion has its common name Rigel, Bayer name Beta Orionis and the Flamsteed number of 19 Ori.

So what about all the millions of stars we see in telescopes. They all have identification numbers in various catalogs. SAO2164 indicates a star in the **S**mithsonian **A**strophysical **O**bservatory catalog. There are several catalogs of various types depending on which institution assembled them or a particular type of object.

Here is a link with more information:

<http://blog.simulationcurriculum.com/articles/2015/5/18/first-night-out-series-how-the-stars-got-their-name>

This links to an article and video about naming stars and how official names are assigned:

<http://www.universetoday.com/104134/can-you-really-name-a-star/>

NASA Space Place Astronomy Club Article

January 2015

This article is provided by NASA Space Place.

With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology.

Visit spaceplace.nasa.gov to explore space and Earth science!



The Loneliest Galaxy In The Universe

By Ethan Siegel

Our greatest, largest-scale surveys of the universe have given us an unprecedented view of cosmic structure extending for tens of billions of light years. With the combined effects of normal matter, dark matter, dark energy, neutrinos and radiation all affecting how matter clumps, collapses and separates over time, the great cosmic web we see is in tremendous agreement with our best theories: the Big Bang and General Relativity. Yet this understanding was only possible because of the pioneering work of Edwin Hubble, who identified a large number of galaxies outside of our own, correctly measured their distance (following the work of Vesto Slipher's work measuring their redshifts), and discovered the expanding universe.

But what if the Milky Way weren't located in one of the "strands" of the great cosmic web, where galaxies are plentiful and ubiquitous in many different directions? What if, instead, we were located in one of the great "voids" separating the vast majority of galaxies? It would've taken telescopes and imaging technology far more advanced than Hubble had at his disposal to even detect a single galaxy beyond our own, much less dozens, hundreds or millions, like we have today. While the nearest galaxies to us are only a few million light years distant, there are voids so large that a galaxy located at the center of one might not see another for a hundred times that distance.

While we've readily learned about our place in the universe from observing what's around us, not everyone is as fortunate. In particular, the galaxy MCG+01-02-015 has not a single known galaxy around it for a hundred million light years in all directions. Were you to draw a sphere around the Milky Way with a radius of 100 million light years, we'd find hundreds of thousands of galaxies. But not MCG+01-02-015; it's the loneliest galaxy ever discovered. Our Milky Way, like most galaxies, has been built up by mergers and accretions of many other galaxies over billions of years, having acquired stars and gas from a slew of our former neighbors. But an isolated galaxy like this one has only the matter it was born with to call its own.

Edwin Hubble made his universe-changing discovery using telescope technology from 1917, yet he would have found absolutely zero other galaxies at all were we situated at MCG+01-02-015's location. The first visible galaxy wouldn't have shown up until we had 1960s-level technology, and who knows if we'd have continued looking? If we were such a lonely galaxy, would we have given up the search, and concluded that our galaxy encompassed all of existence? Or would we have continued peering deeper into the void,

THE LONELIEST GALAXY IN THE UNIVERSE

BY DR. ETHAN SIEGEL, CT'D.

NASA Space Place Astronomy Club Article

January 2015

eventually discovering our unusual location in a vast, expanding universe? For the inhabitants of the loneliest galaxy, we can only hope that they didn't give up the search, and discovered the entire universe.

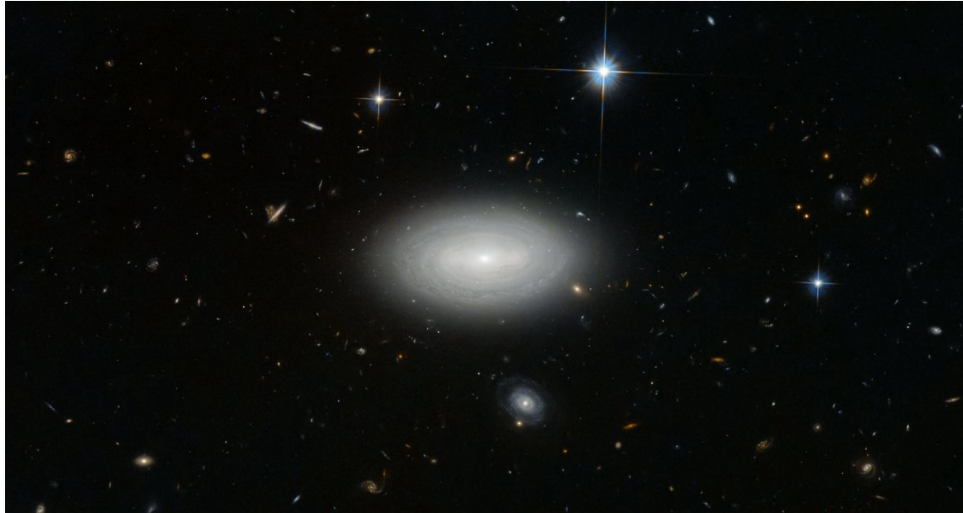


Image credit: ESA/Hubble & NASA and N. Gorin (STScI); Acknowledgement: Judy Schmidt, of the loneliest void galaxy in the known: MCG+01-02-015.



National Aeronautics and
Space Administration



NASA Space Place

Educator Newsletter

January-February 2016 / Vol. 9, Issue 1

NEWS AND NOTES FOR FORMAL AND INFORMAL EDUCATORS

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.

Happy New Year! While you're jotting down those New Year's resolutions, be sure to check out what's happening at NASA Space Place, and to keep up with all the latest, follow us on Facebook and Twitter *@nasaspaceplace*.

New!

Make a pastel aurora

These displays are caused by energy that comes from the sun. You can make your own colorful aurora with oil pastels.

<http://spaceplace.nasa.gov/pastel-aurora>



New!

Why are planets round?

And how round are they? Could some be rounder than others?

<http://spaceplace.nasa.gov/planets-round>



New!

All about Earth's atmosphere

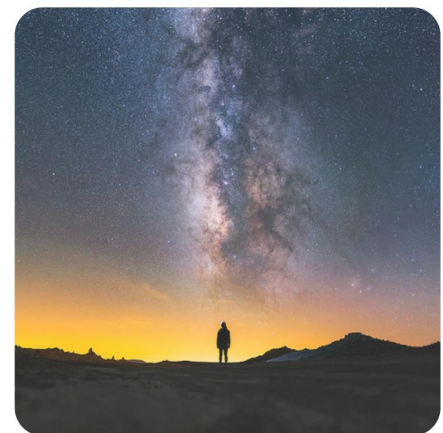
Explore all six layers of Earth's atmosphere in this new series.

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

What is a galaxy?

We live on a planet called Earth that is part of our solar system. But where is our solar system? It's a small part of the Milky Way Galaxy.

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



Explore Earth and space at spaceplace.nasa.gov

New Game!

Play Helios! This game challenges you to keep the fusion reaction going in the sun. It won't be easy. You have to combine protons and neutrons in just the right way to make helium and release energy. Keep the sun shining brightly!



<http://spaceplace.nasa.gov/helios-game>

Interactive Books

NASA Space Place has interactive books about planets, technology, and space. Turn the pages with your mouse or print out a PDF.

<http://spaceplace.nasa.gov/search/books>

Lucy's Planet Hunt

Lucy wonders whether there could be life elsewhere in the universe.



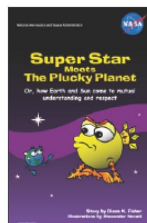
First Annual Planet Awards

We will see which planets are the best in the solar system.



Super Star Meets the Plucky Planet

This is the story of how Earth and the sun come to mutual understanding and respect.



Special Days

Noteworthy days in NASA and space history you can observe in your classroom.

January 7 — In 1610, Galileo discovers Jupiter's four largest moons.

Find out how many moons Jupiter has, as well as the rest of the planets in our solar system.
<http://spaceplace.nasa.gov/how-many-moons>

January 14— The Huygens Probe landed on Saturn's moon Titan in 2005.

Learn more about Saturn, the planet with the most beautiful rings!
<http://spaceplace.nasa.gov/all-about-saturn>

January 31 — On this day in 1958, Explorer 1 was the first U.S. satellite launched into orbit.

Do you know what happens to satellites when they're old and need to be replaced?
<http://spaceplace.nasa.gov/satellite-graveyard>

February 6 — On this day in 1971, astronauts played golf on the moon!

Why is there less gravity on the moon? What is gravity anyway?
<http://spaceplace.nasa.gov/what-is-gravity>

February 18 — Pluto discovered on this day in 1930.

What we now know about this tiny dwarf planet.
<http://spaceplace.nasa.gov/ice-dwarf>

February 20 — First American, John Glenn, orbited Earth in 1962.

See pictures of astronauts in action.
<http://spaceplace.nasa.gov/gallery-technology>



WHERE WE MEET

JENKS HS PLANETARIUM



**Our Club General meetings are held at the
Jenks Public Schools Planetarium
105 East B St, Jenks, OK**

When you enter the building lobby, take the elevator to the 3rd floor.

Meetings begin at 7:00 PM

Printable Detailed map available at http://astrotulsa.com/cms_files/

We hope to see you there!

MEMBERSHIP INFORMATION

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MEMBERSHIP RATES FOR 2016 WILL BE AS FOLLOWS:

ADULTS - \$45 PER YEAR. INCLUDES ASTRONOMICAL LEAGUE MEMBERSHIP.

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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.

MAGAZINE SUBSCRIPTIONS:

ASTRONOMY IS \$34 FOR ONE YEAR OR \$60 FOR 2 YEARS.

WEBSITE: www.astronomy.com

SKY & TELESCOPE IS \$33 PER YEAR.

WEBSITE: www.skyandtelescope.com

SKY & TELESCOPE OFFERS A 10% DISCOUNT ON THEIR PRODUCTS.

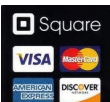
IF YOU ARE AN EXISTING S&T SUBSCRIBER, YOU CAN RENEW DIRECTLY WITH S&T AT THE SAME CLUB RATE. BOTH S&T AND ASTRONOMY NOW HAVE DIGITAL ISSUES FOR COMPUTERS, IPADS AND SMART PHONES.

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>

OR, IF AT A STAR PARTY OR MEETING, SIMPLY FIND A CLUB OFFICER TO ASK ABOUT JOINING OR RENEWING WITH YOUR DEBIT OR CREDIT CARD THROUGH OUR CONVENIENT SQUARE OPTION!



THE ASTRONOMY CLUB OF
TULSA INVITES YOU TO MAKE
PLANS THIS WINTER TO JOIN US
AT A STAR PARTY!

OPEN TO THE PUBLIC

FOR MORE INFORMATION
PLEASE VISIT
WWW.ASTROTULSA.COM.

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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.



Also find us on Facebook!

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AstronomyClubofTulsa](https://www.facebook.com/AstronomyClubofTulsa)



WE ALSO ARE A PROUD PARTICIPANT IN NASA'S NIGHT SKY
NETWORK.

THE EDITOR WISHES TO THANK THE FOLLOWING FOR
THEIR CONTRIBUTIONS TO "THE OBSERVER" FOR
THIS ISSUE:

DR. ETHAN SIEGEL

SKIP WHITEHURST

RICHARD BRADY

TIM DAVIS

TERESA DAVIS

BRAD YOUNG

JOHN LAND

TAMARA GREEN




Photo: Winter stars in the Southern Sky, taken at the Astronomy Club of
Tulsa Observatory, Jan 30, 2016. **Photo by Tamara Green.**




PHOTO: The Great Square of Pegasus setting. Taken at the Astronomy
Club of Tulsa Observatory Jan 30, 2016. **Photo by Tamara Green.**