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ASTRONOMY CLUB OF TULSA

# OBSERVER

## SEPTEMBER 2016

### IMAGE OF THE MONTH:

**THE MILKY WAY, TAKEN AT OSAGE COUNTY BY PATRICK CLANCY  
USED WITH PERMISSION.**



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 REPRINTING. THANK YOU VERY MUCH FOR YOUR COOPERATION. PLEASE ENJOY THIS EDITION OF THE OBSERVER.

**THE ASTRONOMY CLUB TULSA  
IS A PROUD MEMBER OF**



**THE ASTRONOMICAL LEAGUE**

**MANY THANKS TO MR. CLANCY FOR THE USE OF THIS BEAUTIFUL  
IMAGE!**

# SEPTEMBER 2016

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	

## MOON PHASES AND HOLIDAYS



NEW MOON	THU SEP 1
LABOR DAY	MON SEP 5
FIRST QUARTER	FRI SEP 9
FULL (Harvest) MOON	FRI SEP 16
AUTUMNAL EQUINOX	THU SEP 22
LAST QUARTER	FRI SEP 23
NEW MOON	FRI SEP 30

## UPCOMING EVENTS:

MEMBERS' NIGHT**	FRI SEP 2	7:45 PM	ACT OBSERVATORY
"A NIGHT UNDER THE STARS"	FRI SEP 9	8:00 PM	HAIKEY CREEK PARK
GENERAL MEETING	SAT SEP 10	7:00 PM	JENKS HS PLANETARIUM
OKIE-TEX STAR PARTY	SEP 24 THRU OCT 2		BLACK MESA, OK
PUBLIC STAR PARTY	SAT SEP 24	7:30 PM	ACT OBSERVATORY
MEMBERS' NIGHT**	FRI SEP 30	7:15 PM	ACT OBSERVATORY
SIDEWALK ASTRONOMY	SAT OCT 8	6:30 PM	BASS PRO
GENERAL MEETING	FRI OCT 14	7:00 PM	JENKS HS PLANETARIUM
PUBLIC STAR PARTY	SAT OCT 22	6:30 PM	ACT OBSERVATORY
MEMBERS' NIGHT**	FRI OCT 28	6:30 PM	ACT OBSERVATORY

\*\*MEMBERS AND FAMILY ONLY PLEASE.

# OCTOBER 2016

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					

## MOON PHASES & HOLIDAYS:



FIRST QUARTER	SAT OCT 8
FULL (Hunter's) MOON	SAT OCT 15
LAST QUARTER	SAT OCT 22
NEW MOON	SUN OCT 30
HALLOWEEN	MON OCT 31

## FROM THE COVER:

*THE MILKY WAY AT OSAGE COUNTY, IMAGE BY PATRICK CLANCY*

The cover of this month's edition of The Observer does not do this beautiful image from Mr Clancy the proper justice, so here it is in a much bigger size so you can enjoy it more! (Image used with permission from the photographer/imager.)



Many thanks Mr. Clancy! What a wonderful image!

# IMPORTANT ANNOUNCEMENTS

## **SEPTEMBER GENERAL MEETING AND SPECIAL EVENT:**

The September General Meeting has been moved to SATURDAY, SEP. 10 AT 7:00 PM. It will still be held at the Jenks HS Planetarium. The change has been made due to the Club having been asked to participate in a special event being put on by the Tulsa County Parks Department called "A Night Under The Stars", to be held at Haikey Creek Park on Friday, Sep. 9. Details here:

### **A Night Under the Stars—Volunteers with Telescopes Needed**

Sep 9 – 10, 2016 Haikey Creek Park, 11327 S. Garnett Rd., Broken Arrow (Garnett Rd. between 111th and 121st St.

<http://www.parks.tulsacounty.org/SpecialEvents.aspx>

Contact President Richard Brady if you can make it.

There will be no Sidewalk Astronomy event in September due to this event.

## **OKIE-TEX STAR PARTY—Sep. 24 through Oct. 2**

Pre-Registration by mail has closed. Online pre-registration must be completed and paid in full by Midnight CDT on Monday, Sep. 5. At-the-door registration will be \$100 per person. Registration for meals is closed. At-the-door meals are limited.

<http://www.okie-tex.com/registration.php>

## **TULSA ROCKETRY'S HIGH FRONTIER ROCKET LAUNCH EVENT:**

Tulsa Rocketry is hosting High Frontier 13 high-power rocket launch on Sept. 24-25 this year. ACT has traditionally held a public star party in conjunction with this event on Saturday evening, but the dates this year again conflict with Okie-Tex Star Party, so most of the usual suspects will be unavailable for the event. If there are ACT members who might be interested in driving up to Pawhuska and setting up a scope for public viewing, please contact the Tulsa Rocketry club prefect, Paul Reed at [trprefect@gmail.com](mailto:trprefect@gmail.com) and let him know that you will be available. The location is at the Pawhuska Municipal Airport which is west of Pawhuska on US-60. Maps are available on [www.tulsarocketry.org](http://www.tulsarocketry.org).

## **ELECTIONS:**

We plan to have our election of Club officers and board-members-at-large at our October General Meeting on Friday, Oct. 14 at 7:00 PM at the Jenks HS Planetarium. See President's Message on Page 5 for details. We ask that our Club members to come to this important meeting and vote.

## **ANNUAL DINNER MEETING:**

Our Annual Dinner Meeting will be on Saturday, November 12 in the large meeting room across the hall from the Planetarium at Jenks HS, beginning at 6:30 PM. Caterer for the main course and sides TBA shortly, but we also are planning a dessert pot-luck. So if you want to bring a dessert, or water, iced tea, lemonade or a coffee maker and coffee, please contact Tamara Green at [astrotulsa.vp@gmail.com](mailto:astrotulsa.vp@gmail.com) and she will put you on the sign-up list. As always, we will have a good time!

**We hope you can attend all of our upcoming events!**

# PRESIDENT'S MESSAGE

BY RICHARD BRADY



Hi everyone!

The Perseid Meteors have come and gone for another year. While reports from other locales reported a good show, those of us who came out to the observatory (at least 15 members) had to fight partly cloudy skies all night. The clear patches kept moving slowly around. We still were treated to a decent show. For the half dozen or so who stuck it out into the wee hours of the morning, we were rewarded with 3 fairly bright meteors within about 3 seconds, plus a very bright bolide that cast shadows!

Last August 27, Venus and Jupiter were within about 8 minutes of each other right after sunset. That's less than 1/3 the diameter of the Moon. And August 27 happened to be our Public Night. But as our (un-)luck would have it there were clouds along the western horizon right after sunset.

The other planetary show late last month was with Mars and Saturn. On August 23 they formed a nearly straight vertical line with Antares. If you happened to be watching before and after that date, you could readily see Mars moving steadily east each night, one of the few times where the motions of the planets are readily apparent.

Mars and Saturn are still in the southwest in the evening. Mars is still moving noticeably to the east from night to night. Also Venus is still low in the west after sundown. Mercury and Jupiter are too near the sun to be seen, moving into the morning sky.

As a reminder, we are moving the General Meeting at the Jenks Planetarium from Friday to Saturday, September 10, still at 7:00 PM. This is because the Tulsa County Parks Department is hosting "A Night Under the Stars" at Haikey Creek Park on Friday Sept. 9 and they asked us to bring out some telescopes to show the public. More information is on our website's event page, with links to the park department.

As per our by-laws, we will be having elections for officers and the board next month. The following are running for the various positions:

- President - Richard Brady - incumbent
- Vice President - Tamara Green - incumbent
- Secretary - open
- Treasurer - Tim Davis - incumbent
- Board Chris Proctor - incumbent
  - James Liley - incumbent
  - James Taggart - incumbent
  - John Land - incumbent
  - Skip Whitehurst - incumbent
  - Teresa Davis - stepping down from secretary
  - Jerry Cassity
  - Tony Blakesley

We are still looking for someone willing to be the secretary next year. The duties include taking the minutes of Board Meetings and General Meetings, and preparing and counting the ballots from the yearly election. If you are interested in running for secretary, or any other position, please let me know. Any member can run as long as they have been a member for at least a year in good standing.

Also, Owen Green will be taking over from Teresa Davis as Outreach/Group Director.

Finally, don't forget, our annual club dinner is on Saturday, Nov. 12 at the Jenks Planetarium. There will be more details in next month's newsletter.

Clear skies!  
Richard Brady

# TREASURER'S AND MEMBERSHIP REPORT

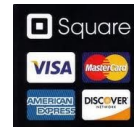
BY TIM DAVIS



Astronomy Club of Tulsa: 174 members, including 46 new members in 2016.

Welcome to our new members this month:

Justin Christensen and Matthew Jennings.



## Club Accounts as of August 31, 2016:

Checking: 5,995.15; Savings: \$4,775.80; Investment accounts: \$19,767.89 (*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](http://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](http://www.skyandtelescope.com)**

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

Note: You may renew your Sky & Telescope subscription directly by calling the number on the renewal form, be sure to ask for the club rate.

NEW SUBSCRIPTIONS must still be sent to the club

## TREASURER'S AND MEMBERSHIP REPORT

BY TIM DAVIS, CT"D.

### 2017 Wall Calendar

The 2017 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](mailto: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. Calendars are available for \$10.00 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**

## TELESCOPE FOR SALE

2012 Celestron CPC 11" New condition, New custom box, only used 4 times. Please contact:

Lloyd Landreth [lwlandreth@gmail.com](mailto:lwlandreth@gmail.com)



# OKIE-TEX STAR PARTY

## SEPTEMBER 24-OCT 2, 2016



If you have not done so already, it is not too late to register for Okie-Tex Star Party 2016, which runs September 24 to October 2, 2016!

**Per the Oklahoma City Astronomy Club's Okie-Tex website: <http://www.okie-tex.com/registration.php>:**

### Pre-Registration and Fees:

The pre-registration fee is \$50.00 for each primary registrant and \$25.00 for each additional family member 16 years old or older. Children under 16 are admitted free of charge. Only primary registrants are eligible for the *Great Okie-Tex Giveaway*. Adult guests may register as primary registrants for \$50.00 if they wish to be eligible in the giveaway or may upgrade their registration for \$25.00 at the party by checking in at the registration desk at anytime prior to the giveaway.

**Pre-registration submissions must be post-marked no later than Saturday September 3, 2016 and must be paid in full. Online Registrations must be completed and paid in full by midnight CDT on Monday September 5, 2016.**

### At-The-Door Registration and Fees:

Registrations received with postmarks after September 3, 2016 and registrations at the door are \$100.00 for all adult guests. At-the-door registrants are eligible to participate in the *Great Okie-Tex Giveaway*.

### Facility Fee:

As part of our ongoing investment in and improvements to Camp Billy Joe, a \$5.00 per day facility fee is charged for **all registrants**. The facility fee is waived for children under 16.

Meals are catered by Jody's Catering of Boise City, OK.

In camp meals provided by Jody's Catering may be purchased. Please refer to the [Meal Request Form](#). Checks for meals are made payable to Jody's Catering. Please pre-purchase meals to ensure enough food is available. At the door meal purchases will be limited. **Meal request form and payment must be received, with a postmark, no later than August 26, 2016.**

**Link to the Okie-Tex Star Party Website: <http://www.okie-tex.com/>**

**Link to the Online Registration Form: <http://www.okie-tex.com/Registration/>**

**Link to the Meals Request Form: <http://www.okie-tex.com/Files/2016meals.pdf>**

Many of us go to Okie-Tex each year and it is really a fantastic star party and a great observing experience. There are also side trips you can take to the dinosaur tracks, the Oklahoma/Colorado/New Mexico tri-state marker, a hike up Black Mesa, nearby Black Mesa State Park and Lake Carl Etling, and Capulin Volcano National Monument.

Hope to see you there!

**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](http://spaceplace.nasa.gov) to explore space and Earth science!



## Is there a super-Earth in the Solar System out beyond Neptune?

By Ethan Siegel

When the advent of large telescopes brought us the discoveries of Uranus and then Neptune, they also brought the great hope of a Solar System even richer in terms of large, massive worlds. While the asteroid belt and the Kuiper belt were each found to possess a large number of substantial icy-and-rocky worlds, none of them approached even Earth in size or mass, much less the true giant worlds. Meanwhile, all-sky infrared surveys, sensitive to red dwarfs, brown dwarfs and Jupiter-mass gas giants, were unable to detect anything new that was closer than Proxima Centauri. At the same time, Kepler taught us that super-Earths, planets between Earth and Neptune in size, were the galaxy's most common, despite our Solar System having none.

The discovery of Sedna in 2003 turned out to be even more groundbreaking than astronomers realized. Although many Trans-Neptunian Objects (TNOs) were discovered beginning in the 1990s, Sedna had properties all the others didn't. With an extremely eccentric orbit and an aphelion taking it farther from the Sun than any other world known at the time, it represented our first glimpse of the hypothetical Oort cloud: a spherical distribution of bodies ranging from hundreds to tens of thousands of A.U. from the Sun. Since the discovery of Sedna, five other long-period, very eccentric TNOs were found prior to 2016 as well. While you'd expect their orbital parameters to be randomly distributed if they occurred by chance, their orbital orientations with respect to the Sun are clustered extremely narrowly: with less than a 1-in-10,000 chance of such an effect appearing randomly.

Whenever we see a new phenomenon with a surprisingly non-random appearance, our scientific intuition calls out for a physical explanation. Astronomers Konstantin Batygin and Mike Brown provided a compelling possibility earlier this year: perhaps a massive perturbing body very distant from the Sun provided the gravitational "kick" to hurl these objects towards the Sun. A single addition to the Solar System would explain the orbits of all of these long-period TNOs, a planet about 10 times the mass of Earth approximately 200 A.U. from the Sun, referred to as **Planet Nine**. More Sedna-like TNOs with similarly aligned orbits are predicted, and since January of 2016, another was found, with its orbit aligning perfectly with these predictions.

Ten meter class telescopes like Keck and Subaru, plus NASA's NEOWISE mission, are currently searching for this hypothetical, massive world. If it exists, it invites the question of its origin: did it form along with our Solar System, or was it captured from another star's vicinity much more recently? Regardless, if Batygin and Brown are right and this object is real, our Solar System may contain a super-Earth after all.



*A possible super-Earth/mini-Neptune world hundreds of times more distant than Earth is from the Sun. Image credit: R. Hurt / Caltech (IPAC)*



National Aeronautics and  
Space Administration



# NASA Space Place

## Educator Newsletter

September-October 2016 / Vol. 9, Issue 4

### 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, Earth science, and technology.

Don't forget to subscribe to our monthly e-newsletter, the NASA Space Place Gazette!

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

*New!*

### Galactic Explorer

A galaxy is a huge collection of gas, dust, and billions of stars all held together by gravity. Visit as many galaxies as possible in Galactic Explorer, our new NASA Space Place game!

<http://spaceplace.nasa.gov/galactic-explorer>



*New!*

### Sun Comparison

Our sun is a bright, hot ball of hydrogen and helium at the center of our solar system. So hot, that it's actually 10,000 degrees Fahrenheit at the surface and 27 million degrees Fahrenheit in the core! But how does our sun compare to other stars?

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

*New!*

### Sunscreen Activity

The sun sends energy toward Earth in the form of ultraviolet light. We can't see UV light with our eyes, but we are still affected by it. Make handprint art using UV light!

<http://spaceplace.nasa.gov/sunscreen-activity>



*New!*

### NASA Space Place Calendar

Looking for some hands-on activities and fun facts to use in the classroom? Check out our 2016-2017 NASA Space Place Calendar! This calendar includes many noteworthy space dates and links to related content on our website.

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

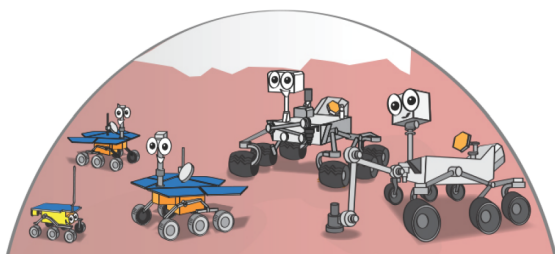


Explore Earth and space at [spaceplace.nasa.gov](http://spaceplace.nasa.gov)

*New!*

## Rovers on Mars!

Over the years, we've sent four rovers to study the cold, red planet we call Mars. We even plan to send another one in just a few years! Meet the team of rovers and discover what we've learned from each one.



### Sojourner

<http://spaceplace.nasa.gov/mars-sojourner>

### Spirit & Opportunity

<http://spaceplace.nasa.gov/mars-spirit-opportunity>

### Curiosity

<http://spaceplace.nasa.gov/mars-curiosity>

### Mars2020

<http://spaceplace.nasa.gov/mars-2020>

## Back to School

Summer is almost over, and that means it's time to head back to the classroom! Here are some helpful resources:

### Math-related Activities

<http://spaceplace.nasa.gov/math-activities>



### Social Media

To keep up with the latest, follow us on Facebook and Twitter [@nasaspaceplace](https://twitter.com/nasaspaceplace).

## Special Days

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

### Sept. 1 — Pioneer 11 made the first flyby of Saturn on this day in 1979.

Five spacecraft, including this one, have been to Saturn so far. Learn more about this beautiful planet!

<http://spaceplace.nasa.gov/all-about-saturn>

### Sept. 18 — Voyager 1 took the first photo of Earth and the moon together in 1977.

Find out what this spacecraft is doing now:

<http://spaceplace.nasa.gov/voyager-to-planets>

### Sept. 23 — Neptune was discovered on this day in 1846.

Neptune is dark, cold, and very windy. What else do we know about this planet?

<http://spaceplace.nasa.gov/all-about-neptune>

### Oct. 1 — Happy Birthday, NASA!

Today, NASA opened its doors for the first time. But did you know there are also other agencies in space?

<http://spaceplace.nasa.gov/other-agencies>

### Oct. 15 — Today, Uranus will be at its closest approach to Earth.

Fun Fact: Uranus actually has faint rings!

<http://spaceplace.nasa.gov/all-about-uranus>

### Oct. 21 — Get ready for the peak of the Orionid meteor shower!

What causes a meteor shower?

<http://spaceplace.nasa.gov/meteor-shower>



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 3<sup>rd</sup> floor.**

**Meetings begin at 7:00 PM**

**Printable Detailed map available at [http://astrotulsa.com/cms\\_files/](http://astrotulsa.com/cms_files/)**

**We hope to see you there!**

## MEMBERSHIP INFORMATION

### ASTRONOMY CLUB OF TULSA OFFICERS:

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SECRETARY TERESA DAVIS

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FACILITIES MANAGER JAMES TAGGART

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### MEMBERSHIP RATES FOR 2016 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.*

### MAGAZINE SUBSCRIPTIONS:

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

WEBSITE: [www.astronomy.com](http://www.astronomy.com)

SKY & TELESCOPE IS \$33 PER YEAR.

WEBSITE: [www.skyandtelescope.com](http://www.skyandtelescope.com)

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

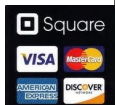
*IF YOU ARE AN EXISTING S&T SUBSCRIBER, YOU CAN RENEW DIRECTLY WITH S&T AT THE SAME CLUB RATE. BOTH S&T AND ASTRONOMY NOW HAVE DIGITAL ISSUES FOR COMPUTERS, IPADS AND SMART PHONES.*

### 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 FALL TO JOIN US AT  
A STAR PARTY!

OPEN TO THE PUBLIC

FOR MORE INFORMATION  
PLEASE VISIT  
WWW.ASTROTULSA.COM.

THE OBSERVER IS A PUBLICATION BY  
THE ASTRONOMY CLUB OF TULSA. THE  
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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  
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WE ALSO ARE A PROUD PARTICIPANT IN NASA'S NIGHT SKY  
NETWORK.

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PHOTOS: Star fields taken at Okie-Tex Star Party, 2015 by Tamara  
Green