



ASTRONOMY CLUB OF TULSA

OBSERVER

MAY 2017

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PHOTOS: Above: The Milky Way and Sagittarius, taken at the ACT Observatory, July 2016; Below: Sidewalk Astronomy at Bass Pro taken August 2017. Both photos by Tamara Green.

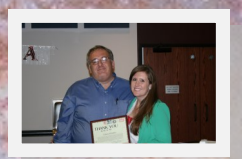
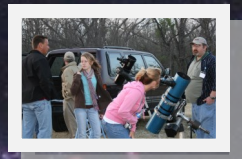
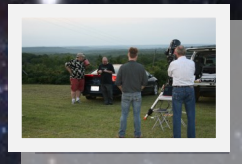
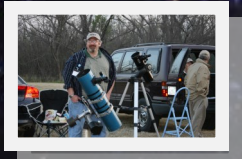


THE ASTRONOMY CLUB TULSA
IS A PROUD MEMBER OF



THE ASTRONOMICAL LEAGUE

IN MEMORIAM



CHRISTOPHER T. PROCTOR

APRIL 21, 1970—APRIL 10, 2017

Board Member-At-Large since 2009

Principal Telescope Operator

Former Facilities Manager

All-Around Great Guy

You will be greatly missed.

IN MEMORIAM

Please Join Us for a Special Public Star Party

In Memory of

CHRISTOPHER T. PROCTOR

Saturday, May 20, 2017





ACT Observatory

7:30 PM

*In case of rain/clouds, a back-up date will be
announced.*

*Chris was a very unique person and will be
greatly missed. We hope you can join us in
honoring his memory.*

MAY 2017

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 AND HOLIDAYS:






FIRST QUARTER	TUE MAY 2
CINCO DE MAYO	FRI MAY 5
FULL MOON	WED MAY 10
MOTHERS' DAY	SUN MAY 14
LAST QUARTER	THU MAY 18
ARMED FORCES DAY	SAT MAY 20
NEW MOON	THU MAY 25
MEMORIAL DAY	MON MAY 29

UPCOMING EVENTS:

GENERAL MEETING	FRI MAY 5	7:00 PM	JENKS HS PLANETARIUM
SIDEWALK ASTRONOMY	SAT MAY 6	7:30 PM	BASS PRO
PUBLIC STAR PARTY	SAT MAY 20	8:00 PM	ACT OBSERVATORY
MEMBERS' NIGHT**	FRI MAY 26	8:15 PM	ACT OBSERVATORY
SIDEWALK ASTRONOMY	SAT JUN 3	8:15 PM	BASS PRO
PUBLIC STAR PARTY	SAT JUN 17	8:15 PM	ACT OBSERVATORY
SUMMER SOLSTICE	TUE JUN 20	11:24 PM	
MEMBERS' NIGHT**	FRI JUN 23	8:45 PM	ACT OBSERVATORY

**MEMBERS AND FAMILY ONLY PLEASE.

JUNE 2017

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:

FIRST QUARTER	THU JUN 1
FULL MOON	FRI JUN 9
LAST QUARTER	SAT JUN 17
FATHERS' DAY	SUN JUN 18
NEW MOON	FRI JUN 23
FIRST QUARTER	FRI JUN 30



Great American Solar Eclipse Updates

Monday Aug 21, 2017 is the date of the long awaited the Great American Solar Eclipse. Everyone continental United States will be able to see at least a partial solar eclipse. Tulsa will experience an 88.6 % partial eclipse.

For State by State details of viewing locations and planned events go to

http://www.eclipse2017.org/2017/path_through_the_US.htm

Also has many helps and suggestions for preparing and viewing the eclipse.

For a Google style map to zoom into any specific location go to

http://xjubier.free.fr/en/site_pages/solar_eclipses/TSE_2017_GoogleMapFull.html

Note: You'll have to read the map instructions details and click agreed button to see the map.

Link to a photography blog regarding the Eclipse: [CLICK LINK HERE](#)

Featured Resource: [2017 Solar Eclipse Resource List](#)

Are you ready for the August 21, 2017 total solar eclipse? Is your community ready? Check out this collection of resources to prepare the 99% of the country who will see a partial eclipse.

Find the list at: https://nightsky.jpl.nasa.gov/download-view.cfm?Doc_ID=588



BUILD A SAFE SOLAR FILTER for your telescope, binoculars or camera. You can make your own Safe Solar Filter using a sheet of Mylar Baader coated material from AstroPhysics. This specially designed material gives safe images with excellent resolution. The Astronomy Club of Tulsa has ordered some of the material in bulk.

25 cm Sqaure (~ 9 in) for \$ 12 available at our club meeting or contact our treasurer Tim Davis. Complete details in our March newsletter

http://astrotulsa.com/CMS_Files/201703.pdf

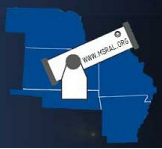


The Tulsa Astronomy club has individual solar glasses that you can purchase at meeting or events for \$ 2 each <https://www.rainbowsymphony.com/> has a good prices on Eclipse glasses and viewing cards. You can purchase bulk orders in lots of 25 or more for about \$ 1.00 each. For the younger kids Eclipse Cards are recommend. Mount them taped securely on a larger sheet of stiff cardboard with a cutout section for the viewing area. This allows their face to be covered from the sun when observing. I bought sets of glasses and cards for friends and each of my grandkids' school classes.

ASTRONOMY CONVENTIONS FOR 2017

Looking for an opportunity to meet other astronomy enthusiasts and learn what area clubs are doing. Consider attending an astronomy convention. You'll meet interesting people, hear some great presentations and guest speakers and even browse the products of invited vendors.

Mid States Region
of
The Astronomical League



The Mid-States Region of the Astronomical League (MSRAL) convention will be held at Missouri State University in Springfield, MO.

Friday June 9 through Sunday June 11.

This event will be cohosted by the Springfield Astronomical Society and the Ozarks Amateur Astronomers Club.. Attractions will include a tour of the University's Baker Observatory near Marshfield, Missouri (birthplace of Edwin Hubble) (<https://physics.missouristate.edu/BakerObservatory.htm>)

Friday evening features a "Star-B-Q" Saturday will have a variety of guest speakers.

Sat Night has a banquet and the keynote speaker will be Dr. Peter Plavchan, Assistant Professor in the Department of Physics, Astronomy, and Material Science at Missouri State University.

Details and registration available at

<https://missouristate.collegiatelink.net/organization/ozarks-amateur-astronomers-club/calendar/details/1277692>

Accommodations available on campus and also in area hotels.

Located just a 3 hour drive from Tulsa, Springfield, Mo. also has many tourist attractions.

The birthplace of President Harry Truman, the city has several historical sites including a National Park at the Wilson's Creek Civil War battlefield which features restored buildings and guided tours of the extensive area. The Fantastic Cavern Cave tours are always a favorite as you can ride through this an ancient limestone cave. Home of the original Bass Pro shop you can tour the adjoining "Wonders of Wildlife" National museum and aquarium.

Other area attractions at <https://www.springfieldmo.org/museums-and-historical-attractions>

PRESIDENT'S MESSAGE

BY RICHARD BRADY



As many of you will have already heard, one of our board members, Chris Proctor, died unexpectedly last month. We plan to remember him at the next Public Night, Saturday, May 20. We plan to meet ½ hour before the scheduled opening time, at 7:30 PM. If we get clouded out, we will have it the following Friday before Members Night, at 7:45 PM. We have invited his co-workers to join us then. Look for an article elsewhere in the newsletter.

Mars is still in the southwest sky this month, but getting lower every evening. View it while you still can, as it will not be visible during most of the summer.

Jupiter is well placed for viewing in the evening now. It went through opposition on April 7. It is dimming slightly, but still the brightest object in the evening sky. It is down to around magnitude -2.3 with an apparent diameter of 41". It culminates (i.e., lies directly south) around 11:00 PM on May 1st and 9:00 PM on May 31st.

Saturn rises about ½ hour after Jupiter crosses the meridian. Saturn itself is due south around 4 AM at the beginning of the month and 2 AM by the end. It stays around magnitude +0.2.

Venus is still the bright morning star around magnitude -4.6. It comes up about 1 ¾ hours before sunrise at the beginning of the month and just over 2 hours by the end.

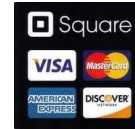
Mercury is lost in the solar glare this month. It went through inferior conjunction last month on April 20.

The Eta Aquarid meteor shower should peak around 4:00 AM the morning of May 7. Look to the east. The moon is about 3 days from full, but it is low in the west and sets around 5:00 AM.

Clear skies!
Richard Brady

TREASURER'S AND MEMBERSHIP REPORT

BY TIM DAVIS



Astronomy Club of Tulsa: 170 members, including 16 new members in 2017.

Welcome to our new members this month: Marinn White and April Bennett.

Club Accounts as of April 30, 2017:

Checking: \$8,237.83; Savings: \$5,776.75; Investment accounts: \$21,248.82 (*Value Fluctuates with Market*)

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 2017 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.



National Aeronautics and
Space Administration



NASA Space Place

Educator Newsletter

May-June 2017 / Vol. 10, Issue 3

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!

Voyager 1 and 2: The Interstellar Mission

The Voyager 1 and 2 spacecraft launched from Earth in 1977. Their mission was to explore Jupiter and Saturn—and beyond to the outer planets of our solar system. Learn more:

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



New!

What is gravity?

Gravity is the force by which a planet or other body draws objects toward its center. The force of gravity keeps all of the planets in orbit around the sun. What else does gravity do? Go here to find out!

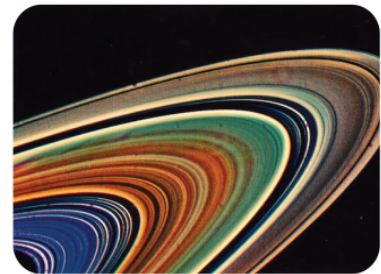
<https://spaceplace.nasa.gov/what-is-gravity>

Saturn's Rings

Saturn's rings are about 400,000 kilometers (240,000 miles) wide.

That's the distance from the Earth to the moon! They range from particles too tiny to see to "particles" the size of a bus. Scientists think they are icy snowballs or ice covered rocks. Learn more:

<https://spaceplace.nasa.gov/saturn-rings>



JunoQuest

Jupiter is the largest planet in our solar system. But, there is still a lot about this gas giant that we don't know. NASA's Juno spacecraft is currently helping scientists learn more. Play JunoQuest and help Juno take us a giant step forward in our understanding of how giant planets form and what part they play in putting together the rest of the solar system:

<https://spaceplace.nasa.gov/junoquest>

Explore Earth and space at spaceplace.nasa.gov

Summer Activities

Looking for fun, educational activities for the summer? Check out these links below:

Make Sun Paper:

Our sun is a burning ball of superheated gas. Even though it's 93 million miles (149.6 million kilometers) away, we can feel its heat and light on Earth. Make this marbled paper that looks just like our sun!

<https://spaceplace.nasa.gov/sun-paper>

Bake Sunspot Cookies:

Even when the sun appears to be shining as brightly as ever to us, it sometimes has some dark spots called sunspots. Learn more with this simple and delicious activity:

<https://spaceplace.nasa.gov/sunspot-cookies>



Make Ultraviolet Handprint Art:

In this activity, see how sunscreen can be used to block the sun's ultraviolet light rays.

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

Make a Pinwheel Galaxy:

The Pinwheel Galaxy is a spiral-shaped galaxy about 21 million light years away from Earth. Scientists call this swirling galaxy M101. Make a Pinwheel Galaxy pinwheel!

<https://spaceplace.nasa.gov/pinwheel-galaxy>

Special Days

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

May 5 — Alan Shepard became the first American in space on this day in 1961.

See more astronauts in action in our gallery:
<https://spaceplace.nasa.gov/gallery-technology>

May 6 — Today is peak viewing time for the Eta Aquarids meteor shower.

What's the difference between an asteroid and meteor?

<https://spaceplace.nasa.gov/asteroid-or-meteor>

May 26 — Astronaut Sally Ride was born on this day in 1951.

She was the first American woman to fly in space! Learn more:

<https://go.nasa.gov/2jtoYHo>

June 8 — Happy World Oceans Day!

Did you know that water covers 71% of Earth's surface, and 96.5% of it is salt water?

<https://spaceplace.nasa.gov/ocean-currents>

June 20 — Today is the first day of summer.

Why does Earth have seasons?

<https://spaceplace.nasa.gov/seasons>

June 22 — Pluto's moon Charon was discovered on this day in 1978.

Learn more about Pluto and its moons.

<https://spaceplace.nasa.gov/ice-dwarf>



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!



NOAA's Joint Polar Satellite System (JPSS) to monitor Earth as never before

By Ethan Siegel

Later this year, an ambitious new Earth-monitoring satellite will launch into a polar orbit around our planet. The new satellite—called JPSS-1—is a collaboration between NASA and NOAA. It is part of a mission called the Joint Polar Satellite System, or JPSS.

At a destination altitude of only 824 km, it will complete an orbit around Earth in just 101 minutes, collecting extraordinarily high-resolution imagery of our surface, oceans and atmosphere. It will obtain full-planet coverage every 12 hours using five separate, independent instruments. This approach enables near-continuous monitoring of a huge variety of weather and climate phenomena.

JPSS-1 will improve the prediction of severe weather events and will help advance early warning systems. It will also be indispensable for long-term climate monitoring, as it will track global rainfall, drought conditions and ocean properties.

The five independent instruments on board are the main assets of this mission:

- The Cross-track Infrared Sounder (CrIS) will detail the atmosphere's 3D structure, measuring water vapor and temperature in over 1,000 infrared spectral channels. It will enable accurate weather forecasting up to seven days in advance of any major weather events.
- The Advanced Technology Microwave Sounder (ATMS) adds 22 microwave channels to CrIS's measurements, improving temperature and moisture readings.
- Taking visible and infrared images of Earth's surface at 750 meter resolution, the Visible Infrared Imaging Radiometer Suite (VIIRS) instrument will enable monitoring of weather patterns, fires, sea temperatures, light pollution, and ocean color observations at unprecedented resolutions.
- The Ozone Mapping and Profiler Suite (OMPS) will measure how ozone concentration varies with altitude and in time over every location on Earth's surface. This can help us understand how UV light penetrates the various layers of Earth's atmosphere.
- The Clouds and the Earth's Radiant System (CERES) instrument will quantify the effect of clouds on Earth's energy balance, measuring solar reflectance and Earth's radiance. It will greatly reduce one of the largest sources of uncertainty in climate modeling.

The information from this satellite will be important for emergency responders, airline pilots, cargo ships, farmers and coastal residents, and many others. Long and short term weather monitoring will be greatly enhanced by JPSS-1 and the rest of the upcoming satellites in the JPSS system.

Want to teach kids about polar and geostationary orbits? Go to the NASA Space Place: <https://spaceplace.nasa.gov/geo-orbits/>



Caption: Ball and Raytheon technicians integrate the VIIRS Optical and Electrical Modules onto the JPSS-1 spacecraft in 2015. The spacecraft will be ready for launch later this year. Image Credit: Ball Aerospace & Technologies Corp.

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/
Directions_JenksPlanetarium.pdf](http://astrotulsa.com/cms_files/Directions_JenksPlanetarium.pdf)**

We hope to see you there!

MEMBERSHIP INFORMATION

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GROUP DIRECTOR OWEN GREEN

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FACILITIES MANAGER JAMES TAGGART

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MEMBERSHIP RATES FOR 2017 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

SKY & TELESCOPE IS \$33 PER YEAR.

WEBSITE: www.skyandtelescope.com

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

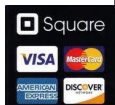
IF YOU ARE AN EXISTING S&T SUBSCRIBER, YOU CAN RENEW DIRECTLY WITH S&T AT THE SAME CLUB RATE. BOTH S&T AND ASTRONOMY NOW HAVE DIGITAL ISSUES FOR COMPUTERS, IPADS AND SMART PHONES.

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 SUMMER 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!

<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:

ETHAN SIEGEL

JOHN LAND

RICHARD BRADY

TIM DAVIS

TAMARA GREEN



PHOTOS: Above, Evening stars over the observatory; Below: More Summer evening stars, both photos taken during the Summer of 2016 by Tamara Green.

