



# Desert Skies

Tucson Amateur Astronomy Association

Volume LVIII, Number 7

July 2012



## Solar Eclipse Images by Paul & Cathy Anderson

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General Meeting July 6th

Steward Observatory Lecture Hall, Room N210

6:30pm

Recent Celestial Event Photos: Solar Eclipse, Lunar Eclipse, & Venus Transit — TAAA Members

7:30pm

The Juno Mission to Jupiter — William Hubbard, UA Lunar & Planetary Lab

Affiliates



## TAAA Meeting Friday, July 6

Steward Observatory Lecture Hall, Room N210, U of A campus



### 6:30pm Astronomy Essentials Lecture

Title: Images of Recent Celestial Events

Speaker: Several Presenters

TAAA has some fantastic astro-photographers and many of them have been clicking those shutters during the recent annular solar eclipse and the Venus transit. We'll use this portion of our meeting to allow some of them to show us their images. Contact our President, Keith Schlottman if you have images to show.

### 7:30pm Invited Lecture

Title: The Juno Mission to Jupiter

Speaker: William Hubbard, UA Lunar & Planetary Lab

The Juno Mission is the second in the series of NASA billion dollar New Frontiers missions. Dr William Hubbard from the University of Arizona Lunar and Planetary Lab and co-investigator for the Juno mission will give our July presentation.

Juno was successfully launched last August and is working flawlessly. It will complete its first loop around the Sun in 2013, rendezvous with Earth and get a gravity assist. It will reach Jupiter in mid-2016 and will be placed into a highly elliptical orbit. It will pass directly above both the north and south poles, coming within 5000 km of Jupiter's cloud tops at low northern latitudes. Views from JunoCam will be spectacular! Meantime, Juno's highly sensitive gravity experiment will reveal some of Jupiter's deep structure.

Dr Hubbard will describe to us the basic purpose of Juno as an experiment to study in detail a giant planet that has hundreds of counterparts in the Galaxy. Dr Hubbard will also describe the contributions amateur astronomers can make to the Juno mission.

## President's Message

We're in the midst of another hot summer, with the accompanying short nights. It seems odd to watch daylight approach before 4:00 a.m., but then maybe the reduced observing time is offset by the warmer temperatures. "Warmer" is a relative term, of course, and if you've invited inexperienced friends to join you at the telescope, you know that many will complain about the chill that descends on us in the late evenings.

If you truly want to escape the heat, you can always visit higher grounds. Some TAAA members have discovered nice observing locations on nearby mountains, including some of the camp areas on Mt. Lemmon. You might also consider a trip out to the club's Chiricahau Astronomy Complex (CAC). At an elevation of about 4,800 feet, CAC cools down nicely in the evenings.

While you're out, be sure to take the time to observe some of our Milky Way Galaxy's finest nebulae. Point your telescope or binoculars towards the South and you'll be

### Cover

Annular solar eclipse images taken by Paul and Cathy Anderson. They viewed the eclipse from Page, Arizona. See more of their images on the TAAA Forum, hosted by Yahoo Groups in the Photo folder. Many more images of this eclipse and the Venus transit will be shown at our 6:30 PM lecture on July 6th.

### Construction Alert!

The construction project for Sun Link, Tucson's modern streetcar, continues to have an impact on the UA campus. **To ease the issue, it is suggested that you park SOUTH of Steward Observatory, perhaps in the Cherry Avenue parking garage. While much of 2nd Street is closed, the 2nd Street parking garage is still accessible.** The intersection of Cherry and 2nd St is closed. First Street is temporarily a two-way street. If you park north of 2nd Street, there is no guarantee you'll be able to easily walk across 2nd Street. Construction crews will attempt to maintain pedestrian access across 2nd St but plan on a few extra minutes needed to walk east or west an extra block to cross. Parking on campus after 5pm parking is free but observe 24-hour enforced restrictions.



rewarded with the rich star fields in the center of the galaxy. If you join other TAAA members at any of our numerous star parties, you'll get a chance to experience the views through many different sizes and types of telescopes.

There are always activities going on in our club, and I encourage you to join in on the fun. Having such an active club is a blessing to us all, but it also requires considerable "behind-the-scenes" planning and work by dedicated volunteers. There's always room for more, and helping out the club is a very rewarding experience.

Our volunteer Board of Directors has been extremely busy this past month. At the general elections held in May, a couple of new Directors were elected, and several others were elected to continue on in their current positions. One of those re-elected was John Croft, for the position of Treasurer. Subsequent to the elections, Mr. Croft made the difficult decision to resign from the Board. His years of service on the Board are greatly appreciated and he made several important improvements to accounting and record-keeping processes during his tenure as Treasurer. The Treasurer's position will be filled by our previous Secretary, Al Anzaldúa, and the Secretary position will be filled by recently elected Member-at-Large, Chuck Hendricks. This shuffling process leaves the Board with an open Member-at-Large position, which we hope to fill in the near future.

(Continued on page 3)

<i>This Month in Brief</i>			
<i>Event</i>	<i>Date</i>	<i>Time</i>	<i>See</i>
<i>Contact Person</i>	<i>Location</i>		<i>Page</i>
Astro Imaging SIG Meeting Larry Phillips	Jul 02 (Mon) Coco's Restaurant 6095 E Broadway	6:30 PM (for dinner)	-
Monthly Meeting Keith Schlottman	Jul 06 (Fri) Steward Observatory Rm N210 933 N Cherry Ave	6:30 PM	2
Science Downtown Central Terri Lappin	Jul 07 (Sat) Science Downtown 300 E. Congress St	10:00 AM	7
Board Meeting Keith Schlottman	Jul 11 (Wed) Steward Observatory N305 933 N Cherry Ave	6:30 PM	5
AFSIG General Meeting Benjamin Bailey	Jul 12 (Thu) USGS Building Room 253 520 N Park Ave	6:30 PM	4
Friday Nite @ TIMPA Ben Bailey	Jul 13 (Fri) TIMPA 3250 N Reservation Rd	6:45 PM	6
Starry Messenger SIG Terri Lappin	Jul 16 (Mon) Beyond Bread 3026 N Campbell	6:30 PM	4
CAC Star Party John & Liz Kalas	Jul 20 & 21 (Fri & Sat) Chiricahua Astronomy Complex		6
Star Party at TIMPA Ben Bailey	Jul 21 (Sat) TIMPA 3250 N Reservation Rd	6:45 PM	6
LPL Summer Science Central Terri Lappin	Jul 28 (Sat) Kuiper Space Sci Bldg/UA Mall 1629 E University Blvd	10:00 AM	7
Astro Imaging SIG Meeting Larry Phillips	Aug 06 (Mon) Coco's Restaurant 6095 E Broadway	7:00 PM (for dinner)	4

**Cancelled**

<i>Future Dates</i>	
Aug 3	TAAA General Meeting
Aug 6	Astro-Imaging SIG Meeting
Aug 8	Board of Directors Meeting
Aug 9	Astronomy Fundamentals SIG Meeting
Aug 10	Friday Nite @ TIMPA Star Party
Aug 11-13	Perseid Meteor Shower
Aug 18	TIMPA and CAC Star Party (CAC also on 8/17)

<i>Upcoming Lectures</i>		
Aug 3	<i>Astronomy Essentials</i>	Mary Turner Seasonal Objects
	<i>Invited</i>	Veronica Bray Impact Craters
Sept 7	Meeting Begins at 6:30pm	TAAA – Meet Yourself

Lectures are arranged by Terri Lappin. Give her your speaker suggestions (see page 15).

At the September meeting we are giving members the opportunity to learn about TAAA programs in an informal setting. Each Special Interest Group as well as program leaders will be available for informal interaction with members. Members will have the freedom of learning about what is of interest to them. This format is in lieu of our traditional "Status of the TAAA" presentations we have been having in September each year. The board believes members will prefer this format to sitting through a meeting of status reports.

### *Newsletter Deadline*

The deadline for the August issue is Wed, July 18. Desert Skies is published one week before the General Meeting. See the publishing guidelines on page 15 for details.

**Visit the TAAA Website**  
[www.tucsonastronomy.org](http://www.tucsonastronomy.org)  
*View all events on our online calendar*  
*RSVP to those you will attend*  
*Get directions from any starting point*

**Unless otherwise noted, contact information for individuals mentioned throughout this newsletter can be found on page 15—"How to Contact Us".**

#### *President's Message (Continued from page 2)*

Clubs as large as TAAA often experience change, but our mission remains the same: "Providing opportunities for members and the public to share the joy and excitement of astronomy through observing, education, and fun". Let's all make sure to take advantage of these summer nights to pursue our fantastic hobby of astronomy. And on July 4th, maybe you can share some celestial fireworks with your neighbors!

*Keith Schlottman*

### *Solar Observing Group*

The Solar Observing group will not be meeting for group solar observing until further notice. Please ignore the July 21st Solar Observing date that appears on the 2012 TAAA wall calendar. Solar observers are encouraged to use the TAAA Forum to post their solar observations.

## Astro-Imaging Special Interest Group (AISIG)

Due to the 4th of July holiday, the Astro-Imaging SIG will not meet this month. Our next meeting will be on Monday, August 6th at the Coco's. Join us then at 6:30 PM for dinner or at 7:00 PM for the meeting.

## Starry Messengers Special Interest Group (SMSIG)



### Meeting

**Jul 16 (Mon)**

Beyond Bread (3026 N Campbell)

6:30 PM



Contact: Terri Lappin

Starry Messengers are TAAA members who support TAAA outreach activities. We bring the message of the stars to the public. We're in good company - Galileo was the first Starry Messenger, showing the wonders of the night sky to a rather skeptical audience. We continue his legacy - lucky for us, our audience is much more accepting of our message.

Join us for our bi-monthly meeting on Monday, July 16th where we'll discuss upcoming outreach events and talk about our outreach projects. We'll hear how Jim Knoll is coming along with the database of objects for public star parties. Cathy Anderson has a wonderful program she brings to star parties in the Green Valley/Sahuarita area. Her program gets kids using a "kid friendly" telescope. We want to implement the same style program in the Tucson area but we need a local program leader. Terri Lappin has started repairing and replenishing our toolkits so they will be ready for school star parties this fall. We'll also discuss an idea that popped up at our April meeting - offering a longer term astronomy program to an interested community organization.

The Starry Messengers SIG is open to any TAAA member who has an interest in outreach and informal education. If family members or co-workers come to you asking about astronomy topics, then you're doing outreach and we want you at our meetings. Your input will always be welcomed.

We meet on the third Monday of odd numbered months at 6:30 PM at the Beyond Bread on Campbell near Glenn. Arrive a bit early if you want to order dinner. Beyond Bread serves gourmet sandwiches, salads, and soup. Meetings end by 8:00 PM.

**Unless otherwise noted, all contact information can be found in the section called "How to Contact Us", found on page 15 of this issue of *Desert Skies*.**

## Astronomy Fundamentals SIG (AFSIG)

### Monthly Meeting

**Jul 12 (Thu)**

6:30 PM

U.S.G.S. Building, Room 253 (520 North Park Ave)

Contact: Ben Bailey



On Thursday, July 12 we will hold our regular monthly meeting. AFSIG is dedicated to building astronomy knowledge and practical skills among our members. Please come out and help us succeed.

The USGS Building is on the northeast corner of Park and 6th Street. Free parking is available nearby after 5pm. Please join us.

### AFSIG Observing Clubs

AFSIG Observing Clubs are open to all members of TAAA at no charge. These guided programs mean that at scheduled observing sessions, there is someone there to guide you in finding the objects or features needed for successful completion of the program. You can join the programs at any time and can either attend the guided sessions or work on your own. A certificate is awarded at the completion of all the requirements. All observing programs are patterned after those of the Astronomical League (AL). If you're an member of the AL, you can continue their program's additional requirements and get your AL certificate.

**Solar Observing Club** helps those interested in observing solar activity — like sunspots, solar flares and other interesting features — and recording those observations. The beauty of this observing program is that our Sun offers great flexibility in observing and recording the different features — you don't have to be concerned about light pollution, night vision, or traveling great distances to find dark skies. The Solar Observing Club is taking a temporary hiatus from their regular observing schedule. Watch the newsletter for future observing dates. If you are interested in solar observing, please email Ben Bailey to be added to the solar observing email list.

**Lunar Observing Club** meets sporadically depending on schedule compatibility and the moon cycle. The purpose of this club is to identify and log 30 specified lunar features — some of which are easy while others are more difficult. This is a great club in which to participate as it is ideal for observing from your back yard or patio. Dark skies are not really necessary and some features are even visible through light clouds. If you are interested in participating in the Lunar Observing Club or if you just want to be added to our email list to keep posted about our activities, email Robert Gilroy at bobgilroy[at]tucsonastronomy.org.

**Constellation Observing Club** meets monthly on our regularly scheduled TIMPA night. The purpose of this club is to identify and log 20 constellations, their brightest stars and deep sky objects. This is a great way to learn your way around the night sky. If you are interested in participating in the Constellation Observing Club or if you just want to be added to our email list to keep posted about our activities, email Paul and Cathy Anderson at paulanderson[at]tucsonastronomy.org.

(Continued on page 5)

AFSIG Observing Clubs (Continued from page 4)

**Solar System Observing Club** meets monthly on our regularly scheduled TIMPA night. The purpose of this club is to observe and log the different features and actions of the planets and their moons and other interesting solar system objects. If you are interested in participating in the Solar System Observing Club or if you just want to be added to our email list to keep posted about our activities, email Brian O'Connell at boc7[at]inbox.com.

**Double Star Observing Club** meets monthly on our regularly scheduled TIMPA night. The dark night sky is filled with millions and millions of stars. Some are close by (relatively speaking) but most are far away. Some are single stars (like our sun) but others are multiple star systems. Of these multiple star systems, we can detect and split many double stars with our equipment. The purpose of this club is to observe and log the different types and colors of double stars. If you are interested in participating in the Double Star Observing Club or if you just want to be added to our email list to keep posted about our activities, email Tom Watson at watson1987[at]cox.net.

### Fundamentals of Astronomy Class

AFSIG is currently considering putting on its popular Fundamentals of Astronomy class this September/October. This class is aimed at giving the beginning amateur astronomer a good start in the hobby including the basics of the night sky, equipment used, and observing techniques. The class is given on three successive Saturdays and usually runs from 9:00 AM to 4:00 PM. After the last class, students and instructors will meet at TIMPA for a potluck supper and star party. The proposed dates are September 22, October 6, and October 13. The class is open to all TAAA members. AFSIG is currently making a list of potential students. If you're interested, send an email to [fundamentals\[at\]tucsonastronomy.org](mailto:fundamentals[at]tucsonastronomy.org) or contact one of the AFSIG Committee members.

### Dark Skies for July 2012

Data provided by Erich Karkoschka

No twilight, No moonlight  
for Tucson in 24-hour MST  
18hrs=6pm, 20hrs=8pm  
22hrs=10pm, 0hrs=midnight

Day	Date	Dark Time		
Sa/Su	30/1	3:09	-	3:41
Su/Mo	1/2	-	-	-
Mo/Tu	2/3	FULL MOON		
Tu/We	3/4	-	-	-
We/Th	4/5	-	-	-
Th/Fr	5/6	-	-	-
Fr/Sa	6/7	21:13	-	21:41
Sa/Su	7/8	21:13	-	22:14
Su/Mo	8/9	21:12	-	22:47
Mo/Tu	9/10	21:12	-	23:18
Tu/We	10/11	21:11	-	23:51
We/Th	11/12	21:11	-	0:25
Th/Fr	12/13	21:10	-	1:03
Fr/Sa	13/14	21:10	-	1:43
Sa/Su	14/15	21:09	-	2:28
Su/Mo	15/16	21:08	-	3:17
Mo/Tu	16/17	21:08	-	3:53
Tu/We	17/18	21:07	-	3:54
We/Th	18/19	21:06	-	3:54
Th/Fr	19/20	21:06	-	3:55
Fr/Sa	20/21	21:05	-	3:56
Sa/Su	21/22	21:04	-	3:57
Su/Mo	22/23	21:31	-	3:58
Mo/Tu	23/24	22:07	-	3:59
Tu/We	24/25	22:44	-	4:00
We/Th	25/26	23:24	-	4:01
Th/Fr	26/27	0:10	-	4:02
Fr/Sa	27/28	1:01	-	4:03
Sa/Su	28/29	1:58	-	4:04
Su/Mo	29/30	3:00	-	4:05
Mo/Tu	30/31	4:05	-	4:06

### Board of Director's Meeting

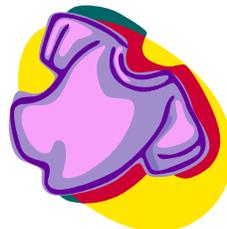
July 11 (Wed)

6:30 PM



Steward Observatory Conference Rm N305

Contact the president to have your topic added to the agenda. There may not be time for topics that are not on the agenda. The front doors at Steward Observatory will be locked. Be there by 6:30pm or call the cell phone number of someone you know is attending the meeting and they can let you in.



### TAAA Apparel

Looking for a special gift or a way to make that fashion statement? Try on something from our fine line of club apparel. We have hats, T-shirts, denim shirts, and patches. Special orders can also be taken. We take cash and checks. Available at most monthly meetings. Coordinated by Mae Smith.

### Desert Dwellers



Be alert for rattlesnakes, especially at night! Rattlesnakes are generally aggressive only if disturbed. If you see one, keep a safe distance and DO NOT try to interact with it in any way. Snakes are much faster than our reflexes, and should be handled only by professionals. Wear boots and long jeans. For more information, go to <http://www.friendsofsaguaro.org/rattlesnakes.html>.

Along with rattlesnakes, other desert critters, such as gophers and ground squirrels, make their home wherever they want. These residents can leave holes and other potential tripping hazards. Be careful when walking, especially at night.

## Members' Star Parties



### TAAA Star Party at TIMPA

Jul 13 (Fri)

Gate opens at 6:45m

Jul 21 (Sat)

Gate opens at 6:45pm

Contact Person: Ben Bailey

The AFSIG is hosting two star parties this month at TIMPA. On both nights an AFSIG representative will open the gates for an evening of viewing. The Gila Monster Observatory will be open for your viewing pleasure. The TIMPA site features a large parking area, and full restroom facilities. Be prepared for cool temperatures after sunset. Guests are welcome, accompanied by a TAAA member. We hope to see you there!

The Gila Monster Observatory houses a Meade 14" telescope donated to the TAAA by David Levy's Sharing the Sky Foundation. All members are encouraged to complete the training program to learn to operate this telescope.

#### TIMPA Site Notice

A gate card is required for TIMPA access. Please *DO NOT* ask the caretakers for entry to the TIMPA SITE. On scheduled TIMPA star party nights, a designated TAAA representative will provide access to the site. At other times, a gate card is available from the TIMPA Gate Card Controller.

#### Directions to TIMPA Site

GPS coordinates: 32 deg 15.868' N, 111 deg 16.390' W

The TIMPA site is about 25 minutes from Speedway & I-10, about 7 miles west of the Arizona-Sonora Desert Museum.

From the North:

1. Take Ina Road west about three miles past I-10.
2. Turn south (left) onto Wade Rd. Wade Rd becomes Picture Rocks Rd as the road turns to the west (right).
3. Take Picture Rocks Rd west to Sandario Rd.
4. Turn south (left) onto Sandario Rd. Go to Manville Rd.
5. Turn west (right) onto Manville Rd. Go to Reservation Rd.
6. Turn south (left) onto Reservation Rd (a dirt road) and go about two miles. The TIMPA entrance is on the left.

From the East:

1. Take Speedway Blvd west. It turns into Gates Pass Rd.
2. Go over Gates Pass and continue west to Kinney Rd.
3. Turn north (right) onto Kinney Rd and continue past the Arizona-Sonora Desert Museum.
4. At the entrance to Saguaro National Park West, go towards the left onto Mile Wide Rd. (This is easy to miss so watch for the park entrance sign.)
5. Take Mile Wide Rd west about five miles to Reservation Rd. Mile Wide Rd ends at Reservation Rd and you must turn north (right) onto Reservation Rd.
6. Take Reservation Rd (a dirt road) north about one mile. The entrance to TIMPA will be on the right.



### Star Party at Chiricahua Astronomy Complex

Jul 20 & 21 (Fri & Sat)

Contact Person/RSVP to: John Kalas

The Chiricahua Astronomy Complex (CAC) is the club's dark observing site. Located in Cochise County approximately 100 miles from the center of Tucson, the site includes a full bathroom facility. At an elevation of 4800 feet, be prepared for cooler temperatures. Try to arrive before sunset. Unlike the TIMPA site, members are required to make reservations for both monthly club star parties and private member use. We are restricted to 60 persons and 30 vehicles maximum at any time. If you would like to attend, you must contact CAC Director John Kalas. Reservations will be on a first come - first serve basis. You need to reserve for both nights if observing both nights. Depending on the number of members interested in attending, guests may not be allowed.

#### CAC Site Notice

*Reservations are required at all times including scheduled star parties.* On scheduled CAC star party nights, a TAAA designated representative will unlock the gate. At other times, access can be granted by the CAC Director.

#### Directions to Chiricahua Astronomy Complex Site

GPS coordinates: 31 deg 52.07' N, 109 deg 30.9' W

The Chiricahua Astronomy Complex is about 90 miles and a 1½ hour drive from the TTT Truck stop at Craycroft Road and Interstate 10.

1. Take I-10 east from Tucson past Benson.
2. Exit I-10 at Dagoon Road (Exit #318) . Turn right onto Dagoon Road at bottom of exit ramp.
3. Travel 13.5 miles southeast to the intersection with Route 191. Turn south (right) onto Route 191.
4. Travel 17.9 miles south (past Sunsites and Margie's Corner Café at High St on the right, and the Border Patrol checkpoint) to the intersection with Route 181 at Sunizona.
5. Turn east (left) onto Route 181 and travel 10.9 miles east to the intersection with South Price Ranch Road. Turn south (right) onto South Price Ranch Rd. This is a dirt road just before you reach mile post 49 (cluster of mailboxes on right side of Route 181).
6. Travel ½ mile south on South Price Ranch Rd to the intersection with East Perseus Way. This is a wide dirt road marked with a street sign on left. Turn east (left) onto East Perseus Way.
7. Travel east on East Perseus Way slightly more than ¼ mile to the entrance of the Chiricahua Astronomy Complex on the right. The address is 9315 E Perseus Way. It is marked with a TAAA sign and twin brown gates flanked by white rail fences set back 50 feet from road.

## Community and Educational Events

Members are asked to support our outreach events. TAAA either sponsors or co-sponsors these events. This is a great opportunity for beginners as you can remain on a single object if you like. You can even contribute without a telescope. Sign up sheets will be at the meeting. You can also contact the star party leader or the volunteer coordinator, see the section "How to Contact Us" on page 15 of this issue. Details and maps can be obtained from the TAAA website calendar.

### Science Downtown Saturday Family Day

**Jul 07 (Sat)\_**

Central

Leader: Terri Lappin

**Set-up: 9:00 AM**

Volunteers Needed: 4

The public is invited to Family Day at the Science Downtown. This is located at 300 E Congress St. We may locate our table and some of our scopes on the sidewalk along Congress. This will depend on safety and whether or not the sun is visible from that location (which is the North side of the building). The event starts at 10:00 AM and ends at 6:00 PM. There will not be any night time observing at this event.

### UA LPL Summer Science Saturday

**Jul 28 (Sat)**

Volunteers Needed: 1  
Leader: Terri Lappin

**Set-up: 9:00 AM**

The public is invited to the University of Arizona's Lunar & Planetary Lab for the Mars Explorer Laboratory Summer Science Saturday event. This is located at 1629 E University Blvd. Telescopes for solar viewing will be on the UA Mall. Other activities will be indoors. Solar observing is from 10:00 AM to 5:00 PM. There will not be any night time observing at this event.

## Night Sky Network Outreach Toolkits

The TAAA has a complete set of all the Night Sky Network Toolkits. Each Night Sky Network Toolkit was developed by the Astronomical Society of the Pacific for use at astronomy outreach events to augment telescope viewing. Several projects are contained in each toolkit, all in a handy, easy to carry box.



The Starry Messenger SIG wants to train more TAAA members in the use of our toolkits. This will help us meet the demand for having these toolkits at star parties. A toolkit will be brought to the monthly TAAA Meeting where members can see the materials and perform the demonstrations. One-on-one training is also available. Toolkits can be checked out for a month at a time and brought to star parties. Star parties doomed by bad weather have been saved by toolkits. Toolkits can also be used at scout meeting or even a family birthday party. Contact Terri Lappin who coordinates the Night Sky Network toolkit program to check out a toolkit.

## Outreach Toolkits Available for Borrowing

*Our Magnetic Sun:* sun model, solar magnetic storms and their impact on Earth, sun protection

*Life in the Universe—Are We Alone?:* origin of and search for life

*Space Rocks – Asteroids, Comets, and Meteorites:* meteorite samples, asteroid detection

*Exploring the Solar System:* scale model of solar system

*Our Galaxy, Our Universe:* scale model of the Milky Way galaxy and the Universe

*Shadows and Silhouettes:* lunar phases, eclipses, and transits

*Black Hole Survival Kit:* gravity concepts

*Supernova!:* life cycle of massive stars, earth's protective atmosphere

*Mirrors and Glass:* how telescopes work

*Telescopes – Eyes on the Universe:* basic principles of optics, the human eye, and observing

*PlanetQuest:* demonstrate planet detection techniques

### Other Outreach Resources

**SolarScope:** provides a white light image of the sun suitable for small group viewing.

**Dark Skies Education Kit:** light pollution principles, includes a Sky Quality Meter

**Comet Chef:** an apron (with a comet on it) and chef's hat to wear when mixing up comets

**Moon Globe:** 12" diameter with stand

**DVDs:** *A Private Universe; Cosmic Collisions*

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## The TAAA Recognition Patio and Walkway Program: A Multipurpose Strategy



This program is a positive fundraising approach that has been tried and tested successfully many times in many places. It involves the use of engraved bricks in the construction of well-placed patios and walkways that will link the various parts of the Chiricahua Astronomy Complex (CAC) to one another. Consider these benefits that this approach will serve:

- Potentially every TAAA member can become involved over a long period of time by contributing or soliciting contributions of others; it is enduring.
- It provides an opportunity to remember and recognize, honor and applaud loved ones and special people, groups, businesses and worthy efforts.
- This method will provide safe, handicapped-accessible routes for our members and guests from the central parking places to the Ramada, the Sleeping Rooms, the Clubhouse/Education Center and the Large Roll-off Roof Observatory(ies). These accessible walkways are both desirable for our members and guests and required of us by the Cochise County Planning Department.
- The patio and walkways will contribute to attractive landscaping.
- The Recognition Brick program will provide an opportunity for members, businesses and others to demonstrate their support for the TAAA educational mission and programs.
- Contributions to the TAAA Recognition Patio and Walkway Program are tax-deductible.
- The contributions will support new development at CAC as well as help to cover the on-going operation and maintenance costs.

Here is how the TAAA Recognition Patio and Walkway Program will work. The engraving of the bricks will be performed by a company, Bricks R Us, that specializes in assisting organizations in fundraising. To learn about this company, go to their website at [www.bricksrus.com/index.asp](http://www.bricksrus.com/index.asp).

Bricks come in 4x8 and 8x8 sizes. A donation of \$150 supports an 8x8 brick, and a \$120 donation supports a 4x8 brick. Of these amounts, \$120 and \$100 respectively will go toward CAC development. (The engraving process costs \$30 for an 8x8 brick and \$20 for a 4x8 brick. The blank paving bricks cost \$.62 each.)

The first project to be supported by the engraved brick program is the Ramada/Outdoor Education Center. This facility will cost about \$14,000. Fifty of the 8x8 bricks and 80 of the 4x8 bricks will provide enough to build the Ramada. It will be a 20' by 30' open-sided structure, to be placed near the parking area.

The patio will be placed adjacent to the sidewalk between the handicapped parking places and the restroom (see related photo). The patio will be about 6' by 30' and will accommodate a number of engraved bricks in a prominent



place in the Complex. The Ramada will be near the Restrooms and, eventually, the sleeping rooms and Education Center/Clubhouse.

An order form with a template for the lettering for both the 4x8 and 8x8 bricks can be found on the next page. If you have questions about this program, please call or email Bill Lofquist (see page 15).

Results of fundraising efforts by other organizations using bricks from Bricks R Us.





## Chris Lancaster's Constellation of the Month

### Bootes

Boh-oh-teez

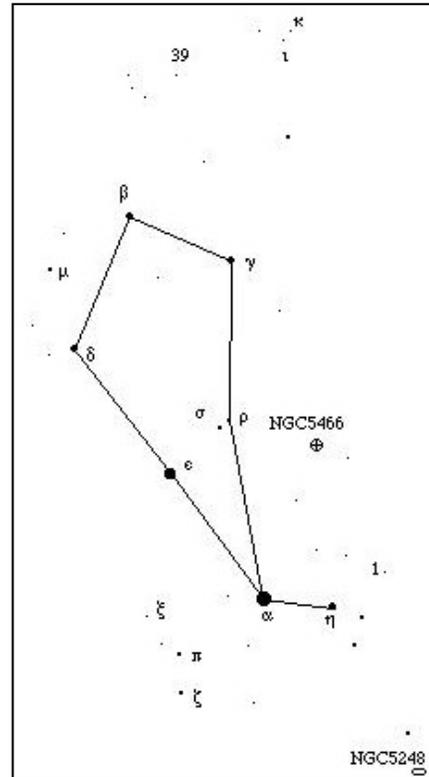
As spring approaches, so, too, does the bright star Arcturus toward the evening sky. It is not only the brightest star in Bootes but also the brightest by far in its neighborhood of the sky at magnitude  $-0.04$ . Being a giant K3 star, its orange color is readily apparent. At mid-month, Arcturus is high overhead on the meridian, marking a spot along the same path if you follow the curve of the handle of the Big Dipper. The general shape of the entire constellation reminds some of us as an ice cream cone or a snow cone--a welcome sight after the hot days of middle and late spring.

Several mythological stories refer to the character drawn in the stars of Bootes. The name itself comes from the Greek word for "herdsman", and arktouros, from which we get the name Arcturus, is Greek for "guardian of the bear." It is said that Bootes is the son of Zeus and Callisto. After Zeus's wife, Hera, went into a jealous rage and turned Callisto into a bear, Bootes encountered the bear and threatened to kill it before Zeus took the bear away and placed it safely in the sky. Bootes is now forever chasing the bear (Ursa Major) around the north celestial pole.

The Egyptians considered the stars near the pole, which never set, to be evil, and thus invented the constellation Bootes (in their eyes a hippopotamus) to keep these stars confined. The Arabs saw the circumpolar stars as a peaceful flock, again herded by Bootes.

Arcturus (Alpha Bootis) shows its orange color very well through a telescope or naked eye. It is cooler than our sun with a surface temperature of 4,200 degrees Kelvin; however, its 4 solar masses occupy a volume much larger than our own star, making its stellar density over 3,000 times less. Its large proper motion of 2.29" per year is due to two factors. First is its proximity, but more so because of its motion relative to ours. While the sun revolves around the galactic core within the plane of the galaxy, Arcturus moves within the great spherical halo surrounding this plane. Arcturus is currently slicing through the part of the galactic disk occupied by the sun, and in a short half million years, it will have receded in the distance beyond naked eye visibility.

Scanning Bootes with binoculars will show you something which is obvious. You'll see scattered stars with no hint of diffuse objects like clusters or nebulae. But looking more



closely at these stars reveals Bootes' main attractions--it is a true playground for fans of double stars. Here's a list of the best of Bootes's doubles:

- ★ Mu Bootis (Alkalurops)-- the easiest double star with a wide separation of 109" between its primary, shining at magnitude 4.5, and its secondary, at 6.5. If you really increase the power you may be able to split the dimmer component which is separated by a scant 2".
- ★ Iota -- a similarly easy separation of 38.5". It's contrasting brightness of magnitudes 5 and 7.5 make for an interesting pair.
- ★ Kappa -- a bit over half a degree to the northwest of Iota. Here is a star of magnitude 4.5 next to a 6.5 companion with 13.3" of separation.
- ★ Pi -- down in the vicinity of Arcturus is this pretty blue-white double. The magnitude 5 and 6 pair are separated by 5.6".
- ★ Xi -- jump 3.7 degrees northeast of Pi to this fairly easy double. This one takes on the appearance of a yellow or gold magnitude 5 primary star of spectral type G8 paired with a reddish magnitude 7 star of type K4. The separation of 6.9" makes it easy to split in small scopes at high power.
- ★ 39-- in the northern reaches of the constellation is a close 6 and 6.5 magnitude pair. Only 2.9" separate this white couple.
- ★ Epsilon -- called "Pulcherrima" (Latin for "most beautiful") by its discoverer F.G.W. Struve in 1829. This is an attractive orange-blue pair which is easy to find, but difficult to split. The magnitude 2.7 primary is 2.6" from magnitude 5 secondary.

All the Constellation of the Month articles in one book!

### Under Dark Skies

### A Guide to the Constellations

By Chris Lancaster

Online for \$14.99 or get it directly from Chris for \$10

ctlancaster[at]msn.com

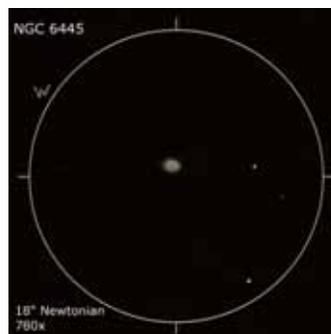
(while supplies last)

## Christian Weis' Planetary Nebulae of the Month

### NGC 6445 and PK 77 +14.1

Planetary nebulae (PN) are fascinating objects that come in numerous forms of appearances. Besides the well known grand four Messiers (M27, M57, M76 and M97), there are hundreds more to explore. This article suggests two PNs, a pretty bright and easy-to-observe one and a harder one for the more ambitious observer who is equipped with a bigger scope.

NGC 6445, better known as the Box Nebula is a pretty peculiar planetary nebula. It was discovered by William Herschel in 1786. It shines at a magnitude of 11m2, so it can be seen in telescopes with an aperture of 3" and more. On good images one can see a lot of unsymmetric detail with the nebula and its outer parts resembling a butterfly. When using a small to medium-sized telescope you will probably only be able to see the bright inner part of the nebula which is two-lobed. I observed NGC 6445 in May 2012 at the Grand Canyon with a 16" Dobsonian and noted: Can be seen as disk at 76x, very unsymmetric appearance at higher magnifications, NW smaller and brighter than SE, ring structure, weak extensions in the SW when observing with [OIII] and UHC, respectively, and averted vision, no central star but assumed a star located excentrically within the nebula; 780x, fst 6m5 (Sag)



**NGC 6445**  
 RA: 17h 49.3min  
 Dec: -20° 01'  
 Constellation: Sagittarius  
 Brightness: 10m9  
 Central star: 19m1  
 Size: 38 x 29 arcsec  
 Distance: 4600 ly

PK 77+14.1 is a rather faint planetary nebula in Cygnus. With an apparent size of more than 3 arcminutes, it is equal in size to the famous Owl Nebula M 97. However, its magnitude of 13m5 (other data in the literature give values of greater than 14m) make it a somewhat hard object to observe. PK 77+14.1 was listed in George Abell's famous catalog in 1965 on 61st position, so it is also referred to as Abell 61. There are some nice images in the internet that show details in that faint object. In the 1990s it was found out that this nebula interacts with interstellar matter, therefore the rim shows some brightening. When observing Abell 61 with an 18" Dobsonian in March 2012 from Germany having very good conditions I noted: Found after long search, only visible with [OIII] filter, UHC does not help, black cloth over my head is important, weak but directly visible homogeneous disk, shape is hard to distinguish, most likely circular, SW maybe a little brighter but very uncertain, no CS, nice starfield; 94x, fst 6m8 (UMa)

#### PK 77+14.1 (Abell 61)

RA: 19h 19.2min  
 Dec: 46° 15'  
 Constellation: Cygnus  
 Brightness: 13m5  
 Central star: 17m4  
 Size: 200 arcsec  
 Distance: 4000 ly



## The Visible Planets this Month

Data provided by Erich Karkoschka

Weekend Sa/Su	Sun		Mercury		Venus		Mars		Jupiter		Saturn		Visibility (VI)	
	Set	Rise	Set	Vi	Rise	Vi	Set	Vi	Rise	Vi	Set	Vi	Code	
30/1	19:32	5:19	21:08	4	3:20	-2	23:44	1	2:56	-1	0:57	1	-3	brilliant
7/8	19:32	5:22	20:52	5	3:00	-3	23:26	1	2:34	-1	0:30	1	0	conspicuous
14/15	19:30	5:26	20:24	8	2:45	-4	23:08	1	2:11	-2	0:03	1	3	moderate
21/22	19:26	5:31	19:45	-	2:34	-4	22:51	1	1:49	-2	23:36	1	6	naked eye limit
28/29	19:22	5:35	19:05	-	2:26	-4	22:34	2	1:26	-2	23:09	1	9	binoculars limit

### Interested in a TAAA Book Club?

Irene Kitzman is looking for a minimum of 5 members who would like to discuss recently read astronomy books. The TAAA-sponsored Astronomy Book Club would look at books aimed at non-professional but whose objective is to inform the general public about astronomy and astronomy-related topics. If you're interested, contact her at [ikitzman\[at\]yahoo.com](mailto:ikitzman[at]yahoo.com)



### Join the TAAA Forum

General astronomy discussions  
 ~75messages/month posted by TAAA members

Hosted by Yahoo Groups  
 Go to <http://tinyurl.com/hwoau>  
 Click on "Join this Group"

## Annular Eclipse near Bryce Canyon

Photos and text by George Barber

The opportunity to see a rare spectacle of nature enticed me and a group of co-workers to venture to the Bryce Canyon, Utah area. Arriving late Thursday night before the eclipse, our advance scouting team (me and Kyle) found the entrance



to Bryce Canyon national park swarming with park rangers armed with red flashlights. All the campsites at the national park were full. Fortunately, we had a back-up plan, and made our way to a remote site at Pine Lake in the Dixie National Forest. We found a beautiful spot right on the lake and made our camp there.

The rest of our party joined us the next day, and we enjoyed the weekend with hikes in Bryce Canyon, a hike around the lake, and the sights and sounds of nature. That

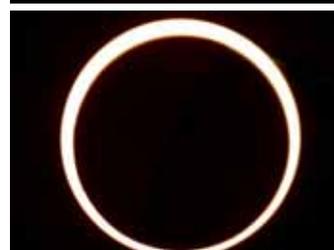


Saturday evening, I set up my trusty Meade LX-10 8-inch Schmidt-Cassegrain. With no cities within miles, and an altitude of 8,000 feet, we enjoyed fantastic views of night sky objects. The one that sticks most in my mind is M13, the

giant globular cluster in Hercules. It was the best view I have ever seen of this object in my scope. The seeing was dead on, I estimate it at 9, and you could easily see the octopus arms coming off the cluster. My friends were astounded.

Everyone was excited that Sunday, anticipating the eclipse. After a pleasant hike around the lake, my friend Michael set up his 10-inch Schmidt-Newtonian. He had expected the arrival of his new full-aperture solar filter, and received it the day before leaving. Unfortunately, he forgot to pack it when he left. It just so happened that I had brought a sheet of Baader film to make filters for my binoculars. We had enough film to make him an off-axis filter. It worked perfectly. Meanwhile, I set up my binoculars with the filters, my Coronado PST for h-alpha viewing, and my 8-inch SCT to take photos. I had never tried using my scope for astro-photography. We mounted my Canon Rebel EOS XSi directly to the scope using an F-3 focal reducer, and I took the first shots. The only way I had to do this was by looking at the display on the back of the camera, so I dismantled the camera and sat in the car to get a shady spot. Everything looked great, so I re-mounted the camera and waited for the eclipse to start. It was not long until the eclipse began, and the excitement began to build.

The giant groups of sunspots really added interest as the Moon gobbled up the Sun's surface. In h-alpha, beautiful prominences and other features highlighted the Sun as we watch the eclipse's progress.



The filtered binoculars also added a very easy way to see the events unfold.

As the eclipsed reached its maximum, the lighting took on an unusual quality. It was definitely getting darker, and everything seemed bluer – maybe because we were at 8,000 feet, I don't know, but it was definitely interesting. The pace of the moon's progress across the sun seemed to quicken, and all 16 of us grabbed our eclipse glasses to watch the final moments toward annularity.

Even though the moon really progresses at the same speed throughout an eclipse, it just seems like the motion of the moon speeds up before the peak of the event. Then, the awaited moment occurred!

Everyone gasped at the spectacle of the ring of fire. For the next few minutes, we all hurried excitedly between the instruments to take it all in.

The moments of annularity passed, and we watched as the moon left the face of the Sun. All during this, there had been a few high clouds around. One of these passed in front of the sun at the end of the eclipse, making for some interesting effects.

The eclipse was over about 7:30 pm, but it never did return to full brightness in the sky, as sunset occurred around 8:30 pm. So, it was like we had a super-long sunset. We bade the Sun good night, and enjoyed a hamburger cookout.





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To preserve and protect the nighttime environment and our heritage of dark skies through quality outdoor lighting.

*The Latest News from Mars*

**Dr. Philip Christensen, Arizona State University**

**Astronomical Society of the Pacific Conference**

**Communicating Science Public Lecture**

Monday, August 6, 2012

7:30 - 9:00 p.m.

Free

DoubleTree Inn Grand Ballroom

445 S Alvernon Way

Dr. Christensen will describe the Mars Science Laboratory's landing site and the landing events, and any initial observations it makes about Gale Crater. He will also touch briefly on the situation and prospects for solar system planetary exploration. (This public talk will be held the day after the Curiosity Mars Rover lands on the surface of the red planet).

**TAAA Loaner Telescope Program**

*Don't own a telescope?*

*Our Telescope Loaner Program is your answer!*

Beginners, here's your chance to learn and observe the sky before buying any equipment. The Loaner Program is available to any current member after meeting requirements detailed in the TAAA Loan Policy. These are some of the telescopes in the program:

Meade 90mm ETX

Coulter Odyssey 8" f/4.5 Dobson

Meade 10" LX200 GPS (requires training)

For members only. Contact the Equipment Loan Coordinator or ask any club officer for details about these telescopes.

*TAAA Classifieds*

For Sale	1989 10in. Meade Schmidt-Cassegrain telescope. Includes tripod, 12 eyepieces, dual axis controller, 2 spotting scopes and original manuals. Asking \$800 OBO. Call Robert at 520-266-9940. First Offered May 2012
For Sale	Celestron 11-inch SCT, three years old, observing chair, micro-touch focuser, auto-focuser Hyperstar and many additions including eyepieces, filters, registered copy of Maxim DL, Deep Sky, Sky Tools, \$3950. Contact Kenny Broste at hooemeye[at]hotmail.com or 520-471-5291 First Offered June 2012
For Sale	14 1/2" Dobsonian telescope. Great optics. Portable. Includes: Telrad finder, NGC "Mini-Max" digital setting circle computer, Crayford focuser, dust cover. Older model Sky Designs unit that still works great. \$1000 obo Contact Warren at 520-826-0177 or warreninaz[at]yahoo.com. First Offered June 2012
For Sale	Orion SkyQuest XT 4.5 Classic Dobsonian Telescope with 1.25" focuser, includes 6 X 30 finder, 25 and 10 mm eyepieces, collimation cap, Starry Night software, eyepiece rack. Excellent condition, great "grab and go" scope. \$125, 1/2 price of new. Michael Thompson, 520-743-8161 First Offered July 2012
For Sale	MR. OLCOTT'S SKIES: AN OLD BOOK AND A YOUTHFUL OBSESSION by Thomas Watson. A brief memoir about find, losing, and finding again the joys of amateur astronomy. Available in paperback from Barnes & Noble and Amazon, \$6.99. Also available in ebook form for Amazon Kindle, Barnes & Noble Nook, iPad, and other ereaders for \$1.99. More information: watson1987[at]cox.net. First Offered July 2012
For Sale	Meade AR 6 refractor. OTA only. Includes hard sided travel case. \$400 Contact Phil Yehle at phil3155[at]gmail.com First Offered July 2012
For Sale	Like new telescope system, 37+ items. AP900, C8 Fastar, ST237A and lots more. Asking \$7000. Contact James at 520-749-3957. A full item list is available. First Offered July 2012

For Sale ads run for 4 consecutive months. Upon request, the ad will run an additional 2 months but only if the asking price is reduced. All other ads will run for 4 months. Beyond these limits, an ad can be resubmitted provided 30 days have passed since the previous ad ran. For additions or changes to this list, call or e-mail the newsletter editor.

*New Policy*



## For our young members...



### Comet Quest

is a game available on The Space Place website. Learn about comets and the Rosetta mission while playing this fast-moving action game. It's like the real Rosetta mission, but you're in control of the spacecraft: You have to drop the comet lander carefully onto the nucleus;

observe and record gas jets, craters, cracks, and other happenings; dodge and dart around ice chunks flying off the nucleus; and in your spare time, communicate with the lander and with Earth. Play the game at

<http://spaceplace.nasa.gov/comet-quest>.

*Space Place Partners' Column*

*June 2012*

## How Many Discoveries Can You Make in a Month?

By Dr Tony Phillips

This year NASA has announced the discovery of 11 planetary systems hosting 26 planets; a gigantic cluster of galaxies known as "El Gordo;" a star exploding 9 billion light years away; alien matter stealing into the solar system; massive bullets of plasma racing out of the galactic center; and hundreds of unknown objects emitting high-energy photons at the edge of the electromagnetic spectrum.

That was just January.

Within NASA's Science Mission Directorate, the Astrophysics Division produces such a list nearly every month. Indeed, at this very moment, data is pouring in from dozens of spacecraft and orbiting observatories.

..."The Hubble, Spitzer, Chandra, and Fermi space telescopes continue to make groundbreaking discoveries on an almost daily basis," says NASA Administrator Charlie Bolden.<sup>1</sup>

NASA astrophysicists and their colleagues conduct an ambitious research program stretching from the edge of the solar system to the edge of the observable Universe. Their work is guided in large part by the National Research Council's Decadal Survey of Astronomy and Astrophysics, which identified the following priorities:

Finding new planets—and possibly new life—around other stars.

Discovering the nature of dark energy and dark matter.

Understanding how stars and galaxies have evolved since the Big Bang.

Studying exotic physics in extreme places like black holes.

Observing time on Hubble and the other "Great Observatories" is allocated accordingly.

Smaller missions are important, too: The Kepler spacecraft, which is only "medium-sized" by NASA standards, has single-handedly identified more than 2300 planet candidates. Recent finds include planets with double suns, massive "super-Earths" and "hot Jupiters," and a miniature solar system. It seems to be only a matter of time before Kepler locates an Earth-sized world in the Goldilocks zone of its parent star, just right for life.

A future astrophysics mission, the James Webb Space Telescope, will be able to study the atmospheres of many of the worlds Kepler is discovering now. The telescope's spectrometers can reveal the chemistry of distant



Artist's concepts such as this one are based on infrared spectrometer data from NASA's Spitzer Space Telescope. This rendering depicts a quadruple-star system called HD 98800. The system is approximately 10 million years old and is located 150 light-years away in the constellation Crater. Credit: NASA/JPL-Caltech/T. Pyle (SSC)

exoplanets, offering clues to their climate, cloud cover, and possibilities for life.

That's not the telescope's prime mission, though. With a primary mirror almost 3 times as wide as Hubble's, and a special sensitivity to penetrating infrared radiation, Webb is designed to look into the most distant recesses of the universe to see how the first stars and galaxies formed after the Big Bang. It is, in short, a Genesis Machine.

Says Bolden, "We're on track in the construction of the James Webb Space Telescope, the most sophisticated science telescope ever constructed to help us reveal the mysteries of the cosmos in ways never before possible." Liftoff is currently scheduled for 2018.

How long will the list of discoveries be in January of that year? Stay tuned for Astrophysics.

For more on NASA's astrophysics missions, check out <http://science.nasa.gov/astrophysics/>. Kids can get some of their mind-boggling astrophysics questions answered by resident Space Place astrophysicist "Dr. Marc" at <http://spaceplace.nasa.gov/dr-marc-space>.

<sup>1</sup> Bolden made these statements in an April 20th editorial he co-authored with John Holdren, Director of the Office of Science and Technology Policy: [http://blogs.nasa.gov/cm/blog/bolden/posts/post\\_1334967201693.html](http://blogs.nasa.gov/cm/blog/bolden/posts/post_1334967201693.html)

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 Family (includes two adults plus minor children) ..... \$30.00  
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 the required form.

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Astronomical League (AL) fee ..... \$7.50  
 Sky & Telescope Magazine 1 year (12 issues, group rate) ..... \$32.95  
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You'll get an email reminder when it's time to renew.  
 TAAA members may join the Astronomical League (AL) at the time they  
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 Discounted Sky & Telescope or Astronomy magazine subscriptions are  
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 TAAA treasurer. Renewals can be paid online through magazine websites.  
 To change an individual subscription to the group rate, pay the group rate  
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 Include a note about what you're paying for. Credit cards are not  
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Mail changes to address above, email them to the treasurer, or make  
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The mission of the Tucson Amateur Astronomy Association is to provide  
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**Night Sky Network**

## Benefits of Night Sky Network Membership

All TAAA members are eligible for a Night Sky Network account. There is no additional cost to you and it gives you access to these and more services. If you haven't activated your Night Sky Network account, contact the treasurer or Terri Lappin. To log into your Night Sky Network account, visit <http://nightsky.jpl.nasa.gov/login.cfm>

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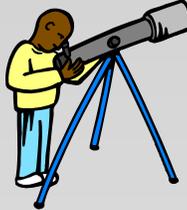
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Notification of Public Events

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Requires iPad or iPhone



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