

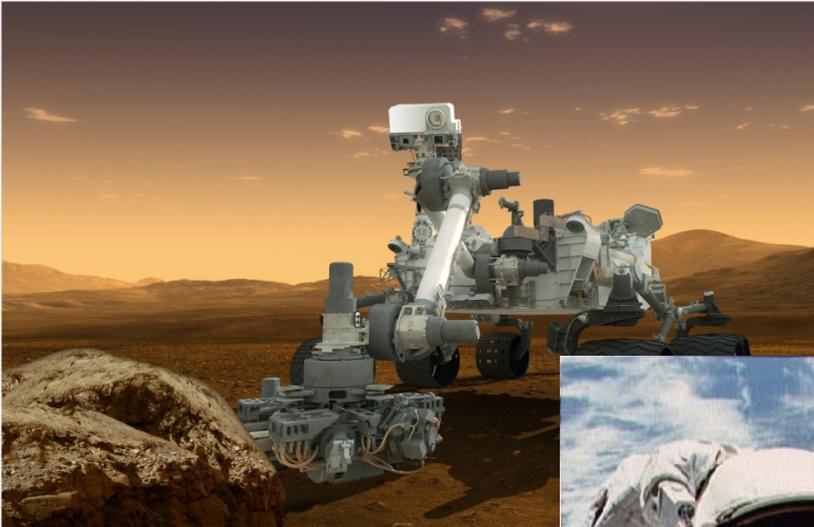


Desert Skies

Tucson Amateur Astronomy Association

Volume LVIII, Number 9

September 2012



Curiosity Lands on Mars



Industrialization of Our Space Program

Special Feature Article—Our Curiosity
Pages 13-14

Fundamentals of Astronomy Class
Page 3

Mt Lemmon Potluck/Star Party—Sept 9
Page 10

Kitt Peak Cultural Star Party—Sept 22
Page 8

General Meeting September 7th

Steward Observatory Lecture Hall, Room N210

6:30pm

Astronomical League Convention Report — Paul Anderson, TAAA ALCOR

7:30pm

The Promise and Perils of Private-Sector Space Development — Al Anzaldúa, TAAA, L5 Space Society/Tucson Space Society

Affiliates



TAAA Meeting Friday, Sept 7

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



6:30pm Astronomy Essentials Lecture

Title: Astronomical League Convention Report
Speaker: Paul Anderson, TAAA ALCOR

Paul Anderson, our ALCOR, attended the 2012 ALCON in Chicago this summer. He'll describe some of the convention events and report on Astronomical League activities.

7:30pm Invited Lecture

Title: The Promise and Perils of Private-Sector Space Development

Speaker: Al Anzaldua, TAAA, L5/Tucson Space Society

Most of us are children of the space race and remember the national pride associated with the American space program. The face of space exploration is considerably different now with commercial space enterprises becoming increasingly important to our nation's space program. Al Anzaldua, our resident space exploration expert, will give us a short summary of the achievements and problems of a government-funded space industry, then, for contrast, he'll quickly move on to a description of recent developments in the commercial space industry.

Al has been a space-activist and advocate since 1986. He was in the past, and is again, president of the L5 Space Society (TSS). Tucson space enthusiasts founded the L5 Society but in 1987 the group merged with the National Space Institute to become the NSS. The TSS is the local chapter of the National Space Society (NSS).

Al served as Science and Environment specialist for several tours during his 16 year employment with the US Department of State as a Foreign Service Officer. Outside of his job, he has given many space development presentations to the public and in the classroom. He even had his own Cable Access TV program in the 1980s devoted to space exploration. More recently, he founded the TAAA Space Exploration SIG.

Construction Alert!



Our meeting attendance has taken quite a hit the past few months—and we think it's construction related.

There is parking available during the streetcar construction, but you need to plan a few extra minutes to navigate the detours. **You can avoid most of the issues by parking SOUTH of the University Mall. Enter from Campbell onto University, then south onto Cherry and you'll find a small parking lot tucked behind Optical Sciences. The Cherry Avenue parking garage is also accessible. Second Street is closed except for access to the Second Street parking garage. Both parking garages have a \$4 or \$5 fee to park.** The intersection of Cherry and 2nd St is closed. Parking north of 2nd Street, you will need to walk one block east of Cherry to cross 2nd Street at Warren. Streetcar construction updates including a map are accessible from the Streetcar info link found on the UA Parking and Transportation website: <http://parking.arizona.edu>

Editor's Message

The summer storms are departing. Let the observing begin! We are fortunate to live in a unique place with many astronomical institutes in our backyard, so to speak. This month, the TAAA has been invited to two different mountaintop events, one hosted by Kitt Peak National Observatory and the other by the Mt Lemmon Sky Center. See the details in this issue for these special events. Our Fall scheduled Kitt Peak potluck/star party is also announced in this issue—it's the day after the October meeting.

Steward Observatory and the Lunar & Planetary Lab have started their fall lecture series which are listed in this issue.

Take note of these upcoming SIG events. Due to Labor Day weekend, the Astro-imaging SIG will meet the second Monday. The Starry Messenger SIG meets this month on the 17th. In addition to their regular meeting on the 13th, the AFSIG will conduct it's "Fundamentals of Astronomy" class starting Oct 22nd.

After a slow summer, our community event star parties are picking up. We have three events that need your support. These are listed on page 7.

Terril Lappin

Volunteer Needed for Assist with Apparel

Mae Smith has been doing an excellent job with the TAAA Apparel Program, but she would like some help. The responsibilities include helping with sales of T-shirts and other items at the monthly meetings, managing the inventory, and placing orders for new items.

Contact any Board member if you are interested in filling this need. Contact information is found on page 17.

Cover

An artist's concept of Curiosity on the planet Mars. (Credit: NASA) Curiosity landed on Mars last month. See Loretta McKibben's article beginning on page 13.

Astronaut Dale A. Gardner, having just completed the major portion of his second extravehicular activity (EVA) period in three days, holds up a "for sale" sign. Astronaut Joseph P. Allen IV, who also participated in the two EVA's, is reflected in Gardner's helmet visor. A portion of each of two recovered satellites is in the lower right corner, with Westar nearer Discovery's aft. (Credit: NASA)

<i>This Month in Brief</i>			
<i>Event</i>	<i>Date</i>	<i>Time</i>	<i>See Page</i>
<i>Contact Person</i>	<i>Location</i>		
Monthly Meeting Keith Schlottman	Sep 07 (Fri) Steward Observatory Rm N210 933 N Cherry Ave	6:30 PM	2
Star Party at TIMPA Robert Gilroy	Sep 08 (Sat) TIMPA 3250 N Reservation Rd	6:00 PM	6
Astro Imaging SIG Meeting Larry Phillips	Sep 10 (Mon) Coco's Restaurant – Broadway 6095 E Broadway	7:00 PM	4
Board Meeting Keith Schlottman	Sep 12 (Wed) Steward Observatory N305 933 N Cherry Ave	6:30 PM	15
AFSIG General Meeting Ben Bailey	Sep 13 (Thu) USGS Building Room 253 520 N Park Ave	6:30 PM	5
Star Party at TIMPA Robert Gilroy	Sep 14 (Fri) TIMPA 3250 N Reservation Rd	6:00 PM	6
CAC Star Party John Kalas	Sep 14/15 (Fri/Sat) Chiricahua Astronomy Complex		6
UA Astro Students Far West Bill Lofquist	Sep 16 (Sun) Redhills Visitor Center 2700 N Kinney Rd	7:00 PM	7
Starry Messenger SIG Meeting Terri Lappin	Sep 17 (Mon) Beyond Bread 3026 N Campbell	6:30 PM	4
KPNO Family Night Far Southwest Bill Lofquist	Sep 22 (Sat) Kitt Peak National Observatory State Route 386	7:00 PM	7, 8
PCC Star Party Northeast Bill Lofquist	Sep 22 (Sat) Private Residence 7341 E Shoreline Dr	6:00 PM	7
Astro Imaging SIG Meeting Larry Phillips	Oct 01 (Mon) Coco's Restaurant – Broadway 6095 E Broadway	7:00 PM	4

Unless otherwise noted, contact information for individuals mentioned throughout this newsletter can be found on page 17—"How to Contact Us".

Fundamentals of Astronomy Class

AFSIG is 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 dates are September 22, October 6, and October 13. The class is open to all TAAA members. We are currently making a class roster. If you are interested, send an e-mail to fundamentals@tucsonastronomy.org or contact one of the AFSIG Committee members.



<i>Future Dates</i>	
Oct 1	Astro-Imaging SIG Meeting
Oct 5	TAAA General Meeting
Oct 6	TIMPA Star Party
Oct 6	Kitt Peak Star-B-Que
Oct 10	Board of Directors Meeting
Oct 11	Astronomy Fundamentals SIG Meeting
Oct 12	Friday Nite @ TIMPA Star Party
Oct 12-13	CAC Star Party
Oct 14	UA Astronomy Student's Star Party

<i>Upcoming Lectures</i>		
Oct 5	<i>Astronomy Essentials</i>	Mary Turner Seasonal Objects
	<i>Invited</i>	Veronica Bray Impact Craters
Nov 2	<i>Astronomy Essentials</i>	Tim Van Devender Observing
	<i>Invited</i>	Xiaohui Fan 3D Universe of Galaxies

Lectures are arranged by Terri Lappin. If you have speakers to suggest, send them to Terri (see page 18).

<i>Items of Interest</i>	
Sep 2	Steward Observatory Evening Lecture (Page 15)
Sep 5	Lunar & Planetary Lab Evening Lecture (Page 14)
Sep 9	Mt Lemmon SkyCenter Picnic/Star Party (Page 10)
Sep 22	Kitt Peak Family Night (Page 7 & 8)
Sep 24	Steward Observatory Evening Lecture (Page 15)
Oct 3	Lunar & Planetary Evening Lecture (Page 14)

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)



*Astro-Imaging Special Interest Group (AISIG)***Special Day!****Meeting: Sept 10 (Mon) 7:00 PM**

Coco's Restaurant (Broadway between Wilmot & Craycroft)

Contact: Larry Phillips

The Astro-Imaging SIG will meet at 7pm on the *second* Monday this month. This is due to Labor Day weekend. Come early, anytime after 6 PM and enjoy dinner before the meeting. We will meet in the banquet room which is to the far left after you enter the restaurant proper. Our program consists of members sharing their images, setups, problems, or suggestions. Meetings end no later than 9 PM. Next month, the meeting will return to the first Monday of the month.

*Starry Messengers Special Interest Group (SMSIG)***Meeting****Sep 17 (Mon)****6:30 PM**

Beyond Bread (3026 N Campbell)

Contact: Terri Lappin

The Starry Messenger SIG will hold a meeting on Monday, September 17th. We meet at the Beyond Bread located on Campbell near Ft Lowell at 6:30pm. If you're interested in spreading your enthusiasm for astronomy, you'll enjoy getting involved in the TAAA outreach programs through the Starry Messengers SIG. At this meeting, we'll talk about how to best use Jim Knoll's list of objects to observe at outreach star parties. Eventually the list will be on the TAAA website. We're still formalizing how that will look.

Last month I attended the Astronomical Society of the Pacific's Communicating Science Conference held in Tucson. It was 3 days of education and public outreach lectures, demonstrations, and discussion forums. Of particular interest were a number of presentations related to the Mayan calendar and misconceptions surrounding impending disaster on or about the Winter Solstice this year. Other than a curiosity, I hadn't given much thought to the Mayan calendar issue, and certainly didn't think it an astronomy outreach issue. It was brought to my attention at the conference that these predictions are cause for concern to many people, especially young children who are unable to judge their worthiness. Unfortunately, a 16-year old in the UK committed suicide after becoming concerned about these predictions. Parents and teachers should take note of any young person who may be overly concerned about the end of the world. Discuss their concerns and seek professional help as needed.

Should astronomers be concerned about misconceptions surrounding the Mayan calendar? Certainly, an archaeologist expects to be asked about the Mayan calendar. Why an astronomer? Many of the doomsday predictions include an astronomical object affecting the Earth. Disasters could result from an asteroid, a supernova, an unseen planet, the Milky Way black hole, or any number of other quasi-scientific theories about the Earth's demise. Do you know that one study found that 12% of Americans believe the Mayan calendar marks the end of the world?¹

Solar Observing Group

The Solar Observing group will not be meeting for group solar observing until further notice. Please ignore the Sept 15th 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.

Unless otherwise noted, all contact information can be found in the section called "How to Contact Us", found on page 17 of this issue of *Desert Skies*.



Starry Messengers SIG -
Opening Minds to the Universe

This presents us with a teaching opportunity. We can ease concern by explaining the distance to the nearest supernova candidate. We can assure the public that potentially dangerous asteroids are being sought and tracked. We might not change the minds of those who subscribe to conspiracy theories, but we can reassure others that these astronomically inspired doomsday scenarios are unlikely to occur in our lifetime.

I picked up a list of resources about this subject at the conference. Contact me (see page 17) and I'll send it to you. A good website is <http://www.2012hoax.org/>

Maybe we could hold a public Solstice Star Party. I imagine we could have an early evening lecture about these doomsday misconceptions. I'm all for doing it, however it's just a few days before Christmas. At our Sept 17th SMSIG meeting, we'll discuss if we want organize a solstice star party. If you can't make the meeting but are interested, let me know. Planning needs to start now!

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.

¹ International poll conducted on behalf of Reuters News: <http://www.ipsos-na.com/news-polls/pressrelease.aspx?id=5610>

Newsletter Deadline

The deadline for the October issue is Wed, Sept 19. Desert Skies is published one week before the General Meeting. Publishing guidelines are on page 17.

Astronomy Fundamentals SIG (AFSIG)



Monthly Meeting

Sep 13 (Thu)

6:30 PM

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

Contact: Ben Bailey

On Thursday, September 13 we will hold our regular monthly meeting. AFSig is dedicated to helping expand astronomical knowledge. 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 AL member, 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.

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.

Dark Skies for September 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		
Fr/Sa	31/1	-	-	-
Sa/Su	1/2	-	-	-
Su/Mo	2/3	-	-	-
Mo/Tu	3/4	20:09	-	20:23
Tu/We	4/5	20:07	-	20:58
We/Th	5/6	20:06	-	21:37
Th/Fr	6/7	20:04	-	22:18
Fr/Sa	7/8	20:03	-	23:03
Sa/Su	8/9	20:01	-	23:52
Su/Mo	9/10	20:00	-	0:44
Mo/Tu	10/11	19:58	-	1:40
Tu/We	11/12	19:57	-	2:38
We/Th	12/13	19:56	-	3:38
Th/Fr	13/14	19:54	-	4:39
Fr/Sa	14/15	19:53	-	4:46
Sa/Su	15/16	19:51	-	4:46
Su/Mo	16/17	19:50	-	4:47
Mo/Tu	17/18	19:48	-	4:48
Tu/We	18/19	20:07	-	4:49
We/Th	19/20	20:55	-	4:49
Th/Fr	20/21	21:49	-	4:50
Fr/Sa	21/22	22:47	-	4:51
Sa/Su	22/23	23:48	-	4:51
Su/Mo	23/24	0:51	-	4:52
Mo/Tu	24/25	1:54	-	4:53
Tu/We	25/26	2:55	-	4:53
We/Th	26/27	3:55	-	4:54
Th/Fr	27/28	4:54	-	4:55
Fr/Sa	28/29	-	-	-
Sa/Su	29/30	FULL MOON		
Su/Mo	30/1	-	-	-



Find us on Facebook
Search for "Tucson Amateur
Astronomy Association"

Members' Star Parties

TAAA Star Party at TIMPA

Sep 8 (Sat)

Gate opens at 6:00PM

Sep 14 (Fri)

Gate opens at 6:00PM

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

Sep 14 & 15 (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 Dragoon Road (Exit #318) . Turn right onto Dragoon 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 these outreach events. You can contact the star party leader or the volunteer coordinator to volunteer for this event; see the section "How to Contact Us" on page 17 of this issue. Details and a map can be obtained from the TAAA website calendar.

UA Astronomy Students Star Party

Sep 16 (Sun)

Far West

Leader: Bill Lofquist

Set-up: 6:30 PM

Volunteers Needed: 6

We are hosting a star party for the UA general science astronomy students at the Saguaro National Park, West Division Red Hills Visitor's Center. This is located at 2700 N Kinney Rd. Those of us who regularly volunteer for these events know the students to be very enjoyable. Telescopes will be set up in the parking lot. Please let Bill Lofquist know if you will be able to support this star party. Observing is from 7:00 PM to 9:30 PM.

Kitt Peak Family Night for Tohono O'odham Nation

Sep 22 (Sat)

Far Southwest

Leader: Bill Lofquist

Set-up: 6:30 PM

Volunteers Needed: 6

Kitt Peak National Observatory is hosting a Family Night for the Tohono O'odham nation. Kitt Peak is located at the end of state route AZ 386, west of Tucson off Ajo Way. Telescopes will be set up near the 36" (0.9 meter) telescope located near the WIYN telescope. Observing starts at 7:00 PM.

Star Party for Pima College staff

Sep 22 (Sat)

Northeast

Leader: Bill Lofquist

Set-up: 5:30 PM

Volunteers Needed: 2

Support staff of Pima Community College are having a star party at a private residence. Approximately 25 adults will be in attendance. Nearby cross streets are Sabino Canyon and Tanque Verde. Heading east on Tanque Verde Road, turn left (north) onto Sabino Canyon Road. Go past a shopping center and a church. Turn right onto Shoreline Drive. This is about ¾ miles north of Tanque Verde and is the last right turn before the bridge over the Rillito Wash. Follow Shoreline Drive as it curves to the right. At the fork in the road, go left (right fork is Springcrest Drive). Continue to the address 7341 East Shoreline Drive which will be just before the road forks again. Telescopes will be set up in the back yard. Observing is from 6:00 PM to 10:00 PM.



Night Sky Network Outreach Toolkits

Night Sky Network Toolkits can be used for any event where you find yourself explaining astronomical concepts to non-astronomers. This can be at a community outreach event like a star party at a school, or a scout troop you're leading. They can be used as a backup to bad weather or to complement telescope observing. These toolkits, developed by the Astronomical Society of the Pacific, are anchored to a particular NASA mission and can be used to explain such basic concepts as gravity, phases of the moon, or the scale of the universe. Several projects are contained in each toolkit, all in a handy, easy to carry box. Project Cards help in the selection of which project to use according to venue and audience/age group. Some projects are better suited for K-4, others for older audiences including adults. Our education system doesn't give wide coverage to astronomy concepts, so even adults will gain something from the K-4 projects. Creating moon phases using Styrofoam balls just before sunset will help instill the reason for the phases in anyone's mind, regardless of age.



Components from several toolkits

We need more members trained in using our toolkits so we can meet demands of teachers in the Tucson area. A toolkit will be brought to our TAAA Meetings to allow members to see the materials and perform the demonstrations. One-on-one training is also available. We allow toolkits to be checked out for a month at a time, giving you plenty of practice time before using a toolkit at an event,. Contact Terri Lappin who coordinates the Night Sky Network toolkit program to check out a toolkit.

Selected 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, 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

Rik Hill's Website Trips on the Internet Super-Skyway

Remote Observing

This is a phrase that usually means packing up the telescope, telescope gear, some sandwiches and drink to head off for some dark sky site in the boonies. Not this time. This time we will explore remote regions of the solar system from the comfort of our backyard.

It always surprises me to learn how many amateur astronomers have never seen Uranus or Neptune. Once you do this you will get hooked and want to see them every year. The colors alone are wonderful to see in a larger telescope.

First thing is finding them. Sky and Telescope has a couple nice finder charts at:

<http://www.skyandtelescope.com/observing/highlights/Uranus-and-Neptune-in-2012-138059253.html>

with a PDF link so you can print out nice copies for use at the telescope. Experienced observers should be able to drop right on the planets with these charts.

Uranus is pretty easy for any telescope larger than 3" aperture. If you have good color vision you will detect it by color, a very nice blue-green. For me it takes at least an 8" aperture as I'm pretty color blind at low light levels.

Imaging Uranus is fairly easy with anything from a DSLR to a webcam. An excellent example of what amateur equipment can show on this planet can be seen at:

http://www.astrosurf.com/pellier/U2012_08_18_CPE.jpg

Neptune is a bit harder. It crosses the meridian about an hour and a half before Uranus so you might want to find Uranus one night and Neptune the next night. Unless you have a pretty good sized aperture or good color sensitivity this one may be more of a challenge. With an 8" aperture I find it's easier to identify this planet by the old "planets don't twinkle" rule. In a large aperture, like my old C14 I could detect the greenish color of the planet. Again, use the S&T charts and then use the twinkle rule or color as you see fit. Don't be afraid to use magnification on these two as they will bear it and will show a distinct non-stellar appearance in anything larger than a 6" aperture since Uranus is usually 3-4" across and Neptune just over 2".

Now for the biggest challenge, have you ever observed Pluto? You're not going to see a disk here as it hovers around 0.1" apparent diameter. I have seen it in as small as a 6" from a very dark locality but I needed good charts to 15th mag.

The best charts I could find on line for Pluto's path in 2012 were posted by the RAS of New Zealand:

<http://www.rasnz.org.nz/SolarSys/2012Pluto.htm>

They only go to 11.5 mag. (3 magnitudes brighter than Pluto) but because this is in Sagittarius where the star density at 14 and 15 mag. is pretty bad, this was necessary. This year it's dancing around south of M25. If you can, try to image the field on consecutive nights and co-add the images. This may be your best chance to detect Pluto in this dense star field. No matter what, this will be a challenging object in this position and you'd certainly make your mark in astrophotography catching it in these starfields.

So here are a few things you can do between the clouds as our monsoon winds down. If you go for these three, please share your results on the TAAA Forum.

As always, if you have some feedback (other than rude comments about my droll humor), a topic you'd like explored or have some interesting URLs you've turned up, please feel free to drop me a line at: [rhill\[at\]lpl.arizona.edu](mailto:rhill[at]lpl.arizona.edu)

TAAA Invited to Cultural Experience on Kitt Peak

Sept 22 (Sat) 4PM – 9PM

Kitt Peak National Observatory



Kitt Peak National Observatory Directors office extends a special invitation to all TAAA members and invites you to a special night on Kitt Peak Saturday, September 22nd, from 4pm to 9pm. Join us for an evening of Tohono O'odham culture, food, observing and telescope access to Your National Observatory!

Park in the picnic grounds shuttles leave for the summit. Shuttles from the parking lot up to the 4-meter provided throughout the evening. Map and Directions: <http://www.noao.edu/outreach/kpvc/Directions.html>

Schedule of Events

Native American food booths open 4-8PM
Native American band "Native Thunder" plays 4:30 – 7PM

Open Telescopes

Visitor Center 16" & 20" with eyepieces
Mayall 4-meter
0.9m with eyepiece
WIYN 3.5-meter
2.1-meter
McMath-Pierce Solar telescope (sunset viewing 6:37pm)

Position Opening for Assistant Director at Mt. Graham International Observatory

The University of Arizona

Steward Observatory, the research arm for the Department of Astronomy at The University of Arizona, is seeking applicants for the Assistant Director of Mount Graham International Observatory (MGIO).

Description: Provide vision, leadership, direction and support to MGIO in all aspects of planning, programming, and facilities management.

Salary: DOE and outstanding UA benefits.

For details and to apply online, visit:
www.UACareers.com/50727

Review begins 9/10/2012.

The University of Arizona is an EEO/AA – M/W/D/V Employer

Tucson Visit by Russian Amateur Astronomers

September 17-25

Contributed by Dean Ketelsen

Email: ketelsen[at]email.arizona.edu

Phone: 520-419-6209

As I've mentioned a couple newsletters ago, a group of young Russian astronomers will be visiting our area for a week in late September. While I had a couple offers of housing from a member or two, they prefer to stay together, so I'll work out the details upon their arrival - camping in my back yard or living room is likely the best choice! The group will consist of Sergey, their adult leader, and 10 kids age 11 to 16. I've got a full agenda planned for them, including observing at Kitt Peak, Mt Lemmon Sky Center and Mount Graham, and a field trip to Northern Arizona to see the Grand Canyon, Meteor Crater and Lowell Observatory. While we had hoped to schedule something with TAAA, it looks like it won't happen unless something opens up - I'll publicize it on the TAAA Forum if an event materializes. We've got a couple extra seats in the 15 passenger van, so if anyone would like to join us for any adventures, especially if any kids their age would care to join in, you would be welcome, as long as you pay your own expenses. Check with me for itinerary details. (Contacts are at top of article)

Kitt Peak Fall Star-B-Que

Oct 6 (Sat)

4:00PM-11:00PM

Kitt Peak Picnic Area

Contact: Dean Ketelsen (ketelsen[at]email.arizona.edu)

The Fall version of our popular Kitt Peak pot-luck picnic and star party will be held on Saturday, 6 October, 2012. October is our second clearest month (after June), so the monsoons should be past us and cool, clear nights will be back. If you are interested in taking part in any of the Observatory tours, please arrive early in the afternoon for docent-led tours. The event starts after 4pm as the mountaintop closes to the public. If you arrive after that time, please do not ascend the mountain past the Picnic Area. As is normal, we will have a gas grill (courtesy of the Kitt Peak Employee's Association), available to grill the meat or vegetables of your choice - bring your favorite for yourself, and a picnic dish to share with others. As sunset approaches, the grill goes off and the scopes come out for observing. We're welcome to stay observe as late as you wish, but moonrise is about 10:45, and no overnight camping is allowed. We have not come close to filling up our allocation of visitors lately, and with the October meeting just the day before the event, please e-mail Dean Ketelsen after 1 October to reserve your spots. Let him know your name, cell or land line phone if we need to contact you, and how many in your group. It should be a great time - see you there!

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. We take cash and checks. Available at most monthly meetings. Coordinated by Mae Smith.



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 for details about these telescopes.



For our young members...

NASA's Space Place



A fun website with games and resources for kids to learn about astronomy and space sciences.

<http://spaceplace.nasa.gov>

Star Child

Information about all things spacey. A service of NASA/Goddard Space Flight Center. Has links to other websites.



<http://starchild.gsfc.nasa.gov>



Imagine the Universe

For older kids, age 14 and up.
<http://imagine.gsfc.nasa.gov/>



International Dark-Sky Association

Southern Arizona Section

Meets 2nd Wednesday

5:30 - 7PM

3225 N First Ave

www.sa-ida.org

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

TAAA Invited to Mt Lemmon SkyCenter Potluck & Star Party

Sept 9 (Sun)

4PM – midnight

Steward Observatory, Mount Lemmon Field Station



On behalf of the Mount Lemmon SkyCenter, The Catalina Sky Survey and Steward Observatory's Catalina Mountain Operations Group, you are invited to a potluck, open house and star party at the Summit of Mount

Lemmon. We hope to have a fun filled evening of food, observatory tours, sunset viewing and night time observing through our telescopes and yours. Bring your own entree (grill provided) and a side dish to share with fellow TAAA members, and astronomers and staff of the Mount Lemmon SkyCenter and the Catalina Sky Survey.

Map and directions: <http://skycenter.arizona.edu/visit/directions>

Approximate event schedule

- 3:30 – 4:00 PM – Gates open for attendees to arrive
- 3:30 – 4:30 PM – TAAA members set up personal telescopes for star party between Learning Center and Minnesota Building
- 4:30 – 5:30 PM – Daylight tours of SkyCenter telescopes (Schulman 32", Jamieson 20", Catalina Sky Survey 60")
- 5:30 – 6:30 PM – Pot luck dinner
- 6:37 PM – view sunset from summit ridge
- 7:00 PM – midnight – TAAA star party on site!

In addition to TAAA member telescopes, the 32 inch Schulman telescope will be open for observing, and it is

anticipated that the 20 inch Jamieson telescope will also be available. While the Catalina Sky Survey will be conducting normal scientific operations that night, scheduled visits with CSS astronomers during the nights observing runs may take place.

****The fine print:** The Mount Lemmon site is a gated facility, therefore while no reservations are required for this event, it is imperative that you arrive on site no later than 4 PM as the gates will then be locked and unattended. Plan on spending an hour of continuous driving from the base of the mountain to reach the observatories.

Alcohol and smoking are strictly prohibited on site. The facility is a no headlights facility, so when parking you'll be directed to park facing out and when departing you must not turn on your headlights until outside the gate. Due to the locked gates, individuals wishing to depart prior to midnight will need to do so on the hour at 9, 10, or 11 PM.

The hope for this event is to strengthen the relationship between the Universities Mount Lemmon observatories and the TAAA and its members– while the event is open to all TAAA members and families, we are not inviting the general public; therefore please do not distribute this invitation outside of the TAAA.

For further information, contact Alan Strauss at [alans\[at\]email.arizona.edu](mailto:alans[at]email.arizona.edu) or 520-626-8122.

TAAA Classifieds

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	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	Nagler 7mm eyepiece \$140. 2-inch ring to make a 2-inch eyepiece parafoal (same focus) with other eyepieces \$4. SAO Star Atlas (151 charts to mag 9 with all NGC objects but no labels) \$40. The Observer's Sky Atlas \$20. Deep-Sky Observer's Handbook Vol. 1-7 \$8 each. Hipparcos and Tycho Catalogues Vol. 2-13 \$1 each. Call Erich at 520-621-3994. First Offered September 2012
For Sale	Bound Astronomical Journals from the 1960s and 1970s FREE. You pick up. Contact Rik Hill at rhill24[at]cox.net or leave a message at 520-721-0123. First Offered September 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

Chris Lancaster's Constellation of the Month

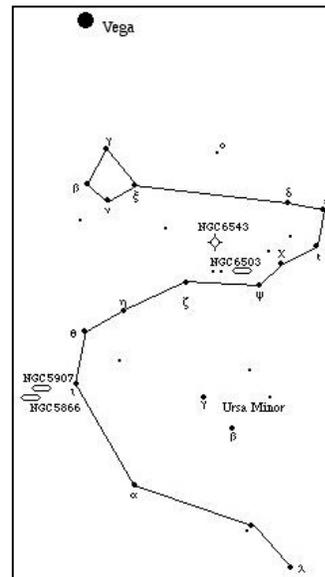
Draco

This group of stars has represented a dragon to almost every ancient civilization that looked toward the heavens. The earliest is probably the Sumerians who saw Draco as the dragon called Tiamat, formerly a Babylonian goddess who turned herself into a dragon to give herself a fighting advantage when other gods began challenging her. The Greeks also employed the dragon in their stories of the conflicts between the Titans and the gods of Olympus as well as in the tales involving Cadmus, the founder of the city of Thebes; the dragon that guarded the Golden Fleece; and the dragon that protected the fruits of one of the twelve labors of Heracles.

To find Draco, look toward the celestial pole. Its back forms an arch over Ursa Minor, and the head of the dragon looks toward Vega, the bright star in the constellation Lyra. If you look near the middle of the dragon's tail you'll see Thuban, or Alpha Draconis, a magnitude 3.7 star which marked the celestial pole almost 5,000 years ago.

Draco has some excellent double stars to choose from, one of which, Nu Draconis, can be split through steadily held binoculars. Otherwise, use low power with a telescopic view to see these two white stars, both of magnitude 5 and spectral type A5, which have a large separation of 62". Psi Draconis is another easy double star to split, having a separation of 30". These two stars also have a similar spectral type with respect to the other (F5 and F8), so they also appear identically white, but one, at magnitude 5, outshines the other by one magnitude. Probably the most visually pleasing double star is Omicron Draconis. This is also an easy pair to split (34") and to see (magnitudes 4.5 and 7.5), but what makes this duo stand out is its gold and pale blue color contrast.

The remaining targets in Draco are more elusive. Starting with the planetary nebula designated NGC6543 and nicknamed the Cat's Eye nebula, its small size, not its dimness, is what makes this object hard to distinguish from the surrounding stars. It measures no more than 20" in diameter at its outer visible edges, and its brightest central regions probably occupy an area of only about 15". It glows at magnitude 8.6, so its high surface brightness makes it stand out at high magnifications. Even so, I had to spend a few seconds adjusting the focus at 240x magnification to make sure that it didn't sharpen beyond what I saw as a lumpy, egg-shaped fuzziness. Its coordinates are RA 17h 58.5', Dec +66d 38'.



Several galaxies inhabit Draco. Unfortunately, most are too dim to see much detail after spending quite a bit of effort to find them. There are three 11th magnitude galaxies, however, which are fairly easy to locate and are worth visiting. Starting with NGC5866 (RA 15h 6.5m, Dec +55d 46' and sometimes known as M102), this shows a broad oval with flattened extensions of its disk on each side. About 1.5 degrees to the northeast is the fantastic edge-on galaxy NGC5907 (RA 15h 15.8m Dec +56d 19.5'), shining at magnitude 11.0 and, with measurements of 11.5' x 1.7', looking like the blade of a sword floating among the stars.

Finally, there is galaxy NGC6503. If the other galaxies were difficult to spot, this one should be easier since its magnitude 10.5 light is concentrated into a smaller oval. You can find it near the base of the dragon's neck at RA 17h 49.5m Dec +70d 08.7m, or a third of the distance between Chi and Zeta Draconis.

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)

The Visible Planets this Month

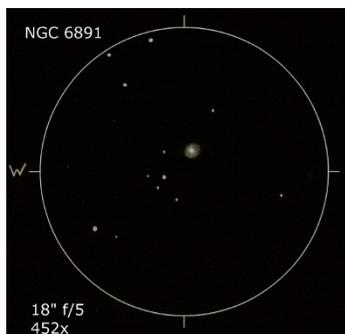
Data provided by Erich Karkoschka

Weekend	Sun		Mercury		Venus		Mars		Jupiter		Saturn		Visibility (Vi)	
	Sa/Su	Set Rise	Rise Vi	Vi	Rise Vi	Vi	Set Vi	Vi	Rise Vi	Vi	Set Vi	Vi	Code	
1/2		18:45 5:58	5:21 8		2:29 -4		21:16 2		23:28 -2		20:59 2		-3	brilliant
8/9		18:36 6:02	Set -		2:36 -4		21:02 2		23:03 -2		20:33 2		0	conspicuous
15/16		18:27 6:07	18:43 -		2:44 -4		20:49 2		22:37 -2		20:08 3		3	moderate
22/23		18:18 6:11	18:46 9		2:54 -4		20:37 2		22:11 -2		19:42 4		6	naked eye limit
29/30		18:09 6:15	18:46 8		3:04 -4		20:25 2		21:44 -3		19:17 5		9	binoculars limit

Christian Weis' Planetary Nebulae of the Month

NGC 6891 and PK 59-18.1 (Abell 72)

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.

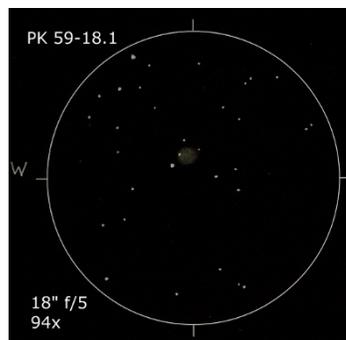


NGC 6891

RA: 20h 15.6min
 Dec: 12° 42'
 Constellation: Delphinus
 Brightness: 10m5
 Central star: 11m1
 Size: 15 x 7 arcsec
 Distance: 7200 ly

NGC 6891 is a quite well known planetary nebula in Delphinus. With an apparent magnitude of 10m5, the nebula can be seen in telescopes as small as 2.5 inches while the slightly fainter central star will require some more aperture to clearly be detected. This object was discovered by Ralph Copeland in 1884. Because of its size, one will have to magnify quite a bit to see some expansion. Some observers report a blueish color – can you see it? When observing this PN in August 2011 in Innerlaterns, Austria, with my 18" Dobsonian I was not able to see any color at all – my color detection at night is pretty poor. My notes read: Very bright, center brighter, fainter shell to the outside, CS blinked, circular, strong response to filters; 452x, fst 6m4 (And), poor seeing

PK 59-18.1 appears some 140 times larger in the sky than NGC 6891. It is located in the same constellation and a real toughie. Abell 72, another designation for PK 59-18.1, was listed in George Abell's famous PN list in 1966. I found a very nice image from Rick (unfortunately I do not know his last name) in the web, which you can find at <http://www.spacebanter.com/attachment.php?attachmentid=2939&stc=1>



PK 59-18.1 (=Abell 72)

RA: 20h 50.1 min
 Dec: 13° 34'
 Constellation: Delphinus
 Brightness: 12m7 (14m6)
 Size: 2 arcmin
 Distance: 4900 ly

Right next to the planetary nebula there is the small and faint galaxy MCG+02-53-005. However, do not expect to see that galaxy unless you really have a big scope. The brightness of it is 16.2mag! I actually needed two attempts to see the PN – which in comparison is a lot brighter and for which one can use filters. My observing notes from July 24th, 2012 read: Requires filter ([OIII] or UHC), significantly expanded at 94x and 72x, homogeneous, conspicuous using averted vision, weak when using direct vision, possibly slightly elongated in E-W, but not sure because of stars being located close by, no central star, requires black cloth; 1st attempt negative on July 18th; 94x, fst 6m4 (Lyr)

Support Our Sponsors

STARIZONA
 ADVENTURES IN ASTRONOMY AND NATURE

5757 N. Oracle Rd. www.starizona.com
 Tucson, AZ 85704 292-5010

Since 1986

Stellar-Vision Astronomy Shop

3721 E. 37th Street
 Tucson, AZ 85713
 (520) 571-0877
Credit Cards Accepted.
www.stellarvisiontucson.com

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.



Visit the TAAA Website

www.tucsonastronomy.org

View all events on our online calendar

RSVP to those you will attend

Get directions from any starting point

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"

Our Curiosity

Contributed by Loretta McKibben

People love robotic rovers on other planets. Scientists can build the most fantastic orbiting telescopes, spacecraft orbiters, landers and flyby missions, but it is the rovers that capture the most attention and fascination from kids as well as adults.

When I was growing up, in the Stone Age (late 1950s and 1960s), Mars was a very faraway place. We could see it as a red dot in the night sky, and scientists had deciphered a few enticing details such as carbon dioxide in the atmosphere. My favorite book of Mars from first grade had wondrous paintings of Martian dust devils, possible canals, and other imagined views from artist Ray Gallant. Those images are seared into my memory, and fired my imagination like no others. I wanted to see Mars first-hand, like most of you here in TAAA.

Unlike the Moon, which had beautiful craters and mare on its surface that were visible with my first little refractor telescope, Mars was a featureless disk. Try as I could, I did not see any of the dark patches or bright white polar caps. I bet you've had a similar experience with your first telescope! Then NASA sent spacecraft to Mars, and we began to get acquainted with its volcanoes, huge Mariner Valley, impact craters, and polar regions. Stunning images from the Viking landers and orbiters in the 1970s made us finally see Mars as a real place,

But it was Little Pathfinder, the tiny NASA rover from the late 1990s, that showed the world that Mars is definitely a place that we can explore actively from a distance. The fact that it could move about really captured people's attention like no previous missions. Then came the Mars Exploration Rovers named Spirit and Opportunity, who landed in 2004. Designed to last 90 days, or until dust choked their solar panels so that they were unable to generate enough heat to keep their electronics from freezing, those rovers surprised everyone. Thanks to the real, energetic dust devils of Mars which regularly swept them clean, they've lasted for years and made numerous discoveries including proving that Mars was once warm and wet, some 2 billion years ago. And Opportunity is still working!

With what they've learned from the landers and orbiters, Mars scientists and engineers still had many more questions to answer. We still don't know if Mars ever had life, the biggest question of them all. Enter a new generation of rover which has advanced experiments on board and state-of-the-art cameras. If it could successfully land on Mars, this bigger, better robot would be the next step in Mars exploration.

On August 5, 2012, at about 10:30 pm (Arizona time), people from around the world were watching NASA TV live on the web for the historic landing of the Mars Science Lander named Curiosity. The rover would have to decelerate from 13,000 miles per hour — its space velocity — to landing (and zero velocity) in only seven minutes! Further, it had to land in a target area much smaller than its predecessors, the Mars Exploration Rovers. There were almost two hundred critical scheduled events in EDL (Entry, Descent and Landing) during the aptly named "Seven

Minutes of Terror" that had to work as expected, or the most expensive robotic rover ever built would be lost.

There was only one shot! All or nothing! The worst part of the evening was the 14 minutes that it took to transmit a signal from Mars to Earth. Curiosity would already have landed or crashed before we received its signals!

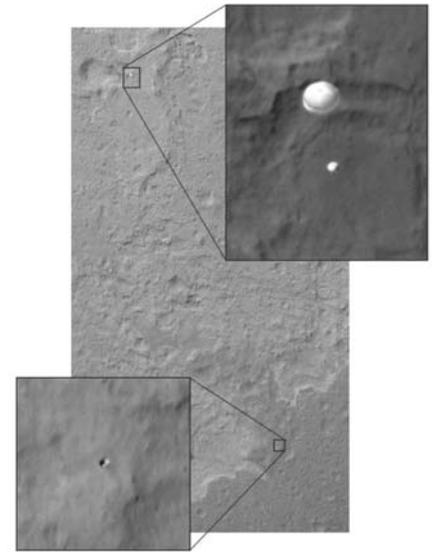
Then the NASA personnel said "Touchdown confirmed! We're safe on Mars!" The cries and jubilation of those mission control workers on my computer screen were fantastic to watch. For a moment, people around the globe were one, watching and sharing in a tremendous scientific and engineering feat live on the internet. Curiosity wasn't just a NASA rover, it belonged to everyone on Earth!

"We've got thumbnails. It's a wheel! It's a wheel!" The first low-resolution images came in, and were immediately shared. One of Curiosity's hazard cameras had taken an image of the rover's wheel! And there was the shadow of the rover, resplendent in the Martian sunset. A new adventure has begun!

Since landing, new software was uploaded to the rover which will allow it to drive around the Martian surface and conduct its experiments. Its fifteen sophisticated instruments were checked out, including the Chemcam suite of remote sensing instruments, and a Russian instrument for detecting ice and water. There are multiple cameras on the rover, including the Mastcam system on the main mast, two cameras which provide multiple spectra and true-color imaging, as well as 3-D views.

If scientists are interested in a geologic surface, Curiosity can vaporize a small portion using its infrared laser and examine the generated spectra. To take a closer look, it can use its long arm to use its microscope (the Mars Hand Lens Imager, or MaHLI) and X-ray spectrometer. For extremely interesting materials, Curiosity can also drill into a rock and deliver the powdered material to its sample analyzer oven (SAM, or Sample Analysis at Mars).

The rover also has a meteorological station to keep an eye on the Martian weather called the Rover Environmental



NASA Image PIA15993 shows Curiosity descending on its parachute, as well as the heat shield that was jettisoned. This image was taken by the HiRISE camera on the Mars Reconnaissance Orbiter.

(Continued on page 14)

(Our Curiosity, continued from page 13)

Monitoring Station. A Radiation Assessment Monitor will measure the radiation in the Martian environment, Twelve engineering cameras support mobility, and include hazcams (on each if its four corners, used to identify motion hazards with close-up views of the wheels) and two pairs of navcams mounted on the mast, which aid in navigating by providing longer-distance views of the terrain ahead of the rover.

Nuclear power will allow Curiosity to keep exploring through the long Martian winter, the season when Opportunity still has to park on a hill and seek a maximum Sun angle to generate enough power to keep from freezing.

The Mars Science Laboratory mission has four main scientific goals:

- Determine the habitability for life on Mars at the landing site, Gale Crater, including the role of water.
- To study the climate of Mars
- To study the geology and geologic history of Mars
- To prepare for a future manned mission to Mars.

To achieve these scientific goals, the rover will search for the chemical building blocks of life such as carbon, hydrogen, nitrogen, oxygen, phosphorous, and sulfur. Scientists will use Curiosity's instruments to inventory and study the nature of organic carbon compounds on Mars, which are necessary for Earth-like life.



NASA Image PIA16105 from the Planetary Photojournal, which shows the many layers of Mt. Sharp which may hold keys to the geologic history of Mars. This area will be explored first-hand by Curiosity in the future. Image taken by the Mastcam (mast camera) on Curiosity, the Mars Science Laboratory.

The rover will study the geologic and geochemical history of the planet. Scientists will work to understand the evolution of the Martian atmosphere over the last 4 billion years, and determine the distribution and cycles of water and carbon dioxide.

The rover's instruments will yield information on the surface radiation on Mars due to solar, galactic, and cosmic radiation, which is much greater than on Earth due to its thin atmosphere and lack of a planetary magnetic field. This surface radiation information and data gathered en route to Mars are important in planning for future human missions, which will require new technologies to shield astronauts from its deadly effects.

So in the coming years, we will witness wonderful discoveries as Curiosity will use its cameras and instruments to study the geology and climate of Mars, to investigate its habitability for life as we know it, and to collect information for an eventual manned mission. We are lucky to witness this in our lifetimes!

Share in Curiosity's Discoveries

NASA's Planetary Photojournal – See all the latest images from NASA's solar system exploration missions.

<http://photojournal.jpl.nasa.gov>

NASA/JPL Mars Home Page

<http://mars.jpl.nasa.gov>

Malin Space Sciences Systems – MSSS designed and built the MAHLI, MARDI and Mastcam system cameras for Curiosity.

<http://www.msss.com>



Lunar and Planetary Laboratory 2012 Fall Lecture Series

Kuiper Space Sciences, Room 308 (1629 E University Blvd)
7:00 pm — 8:00 pm

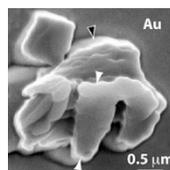


Where Did All Earth's Water Come From?

Dr. Ilaria Pascucci, Assistant Professor
Wednesday, Sept 5, 2012



With oceans covering about 70% of its surface, Earth is a watery place. Liquid water has played an important role in the origin and development of terrestrial life, yet its origin and abundance remains an exciting and hotly debated question. Dr Pascucci will review current ideas about the origin of Earth's water and discuss new insights coming from the study of protoplanetary disks and exoplanets.



Laboratory-based Astronomy at the Nanometer Scale

Dr. Tom Zega, Assistant Professor
Wednesday, October 3, 2012



Throughout the course of their life cycles, stars shed matter through dust-driven winds or by supernovas. This matter travels through the interstellar medium where it can become the starting material for new stars or planetary-forming nebulae. Dr Zega will show how, using the tools of nanoscience in the lab, we can probe primitive meteorites, extracting ancient stardust from them, and gaining fundamentally new insights into the histories of the grains and the stars from which they formed.

TAAA Board of Directors Meeting—8 August 2012

Attending Board members present (5): Keith Schlottman, Bob Gilroy, Chuck Hendricks, Al Anzaldua, Vern Dunlap.

Members present (4): Ben Bailey, Tim Van Devender, Terri Lappin, Larry Brown.

The President called the meeting to order at 6:37 pm.

Board Minutes: Motion by R. Gilroy to accept minutes of 11 July 2012. Seconded by A. Anzaldua. Motion carried.

Motion by R. Gilroy to accept treasurer’s report. Seconded by V. Dunlap. Motion carried.

Member Feedback: The Board discussed feedback regarding the last general membership meeting. Business being conducted at rear of auditorium was distracting to those listening to the lecture. Low attendance is attributed to construction projects which leads to parking problems.

Announcements: Bob Gilroy reports that we have some 250 active members. There are a number of members who have not renewed for six or more months. The membership mailing list required updating – of which we are in the process of doing. A process has been established for reminding members when their membership comes up for renewal. K. Schlottman says he will add a slide to the pre-meeting PowerPoint presentation reminding members to renew.

SIG Status Reports:

Starry Messengers SIG (SMSIG) Report: The Starry Messenger SIG has a database of about 80 objects that are likely observed during our outreach events. Jim Knoll did most of the work gathering this information.

Terri Lappin met for an hour with a program evaluator during the “Communicating Science” conference to discuss the possible addition of evaluation methods to the project. This would give us insights into the effectiveness of the program and provide direction to its future growth.

Terri gave a report on the ASP E/PO Meeting. TAAA members John Kalas, Byron Skinner, Joe Statkevics, and Jim Knoll supported a star party Monday night during which it started raining. It was suggested during one of the workshops that TAAA host a star party on the 21st of December to coincide with the Winter Solstice.

Astronomers without Borders are interested in collaborating with TAAA to conduct outreach programs.

Treasurer’s Report: Total membership dues received in July was \$843.00. Higher than normal due to the extra effort by the board to contact members who missed their renewal date. Other income this past month: Brick Program \$2,555.00; Total Fundraising \$2,675.00; Total Income \$3,518.00.

Web Director/E-Services Report: Board agreed to allow Tim to proceed with his Web Page/E-Services activities.

Upcoming Meetings: AFSIG meeting on Thurs, 9 Aug 12.

Other Business:

- K. Schlottman has found a volunteer for the calendar.
- Meeting to talk about the Youth outreach proposal is tomorrow, Aug 9.

- Grand Canyon Star Party apparel issue. Mae Smith, our Apparel Coordinator, has agreed to coordinate and purchase apparel for the Grand Canyon Star Party as part of the duties and responsibilities of the apparel coordinator.
- The board agreed to use our Sky and Telescope magazines as handout material.
- Russian students will be visiting Tucson arriving between 9/17 and 9/25. Dean Ketelsen will be directing their activities. R. Gilroy suggested the possibility of opening TIMPA during the visit.
- Motion made by A. Anzaldua to approve the use of a Parent/Guardian Waiver Form; Rules for Hosted Youth Star Parties at TIMPA; and Rules and Suggestions for Attending Youth Star Parties at TIMPA. To become Effective October 1, 2012. Motion seconded by R.Gilroy. Motion carried.

Member at Large Position: Tim Van Devender reminded the Board that he had volunteered to accept the vacant Member at Large position. The matter was discussed in an executive session. Following executive session, A. Anzaldua made motion that Tim Van Devender be appointed to the vacant Member-at-Large position. Seconded by C. Hendricks. Motion carried.

Meeting adjourned at 9:50pm.

Respectfully submitted,
Chuck Hendricks, TAAA Secretary

Next Board of Director's Meeting

Sept 12 (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.



Steward Observatory Public Evening Lecture Series

Fall 2012



Steward Observatory Lecture Hall (Room N210)
933 N Cherry Ave 7:30pm

Sept 12 (Wed)	Dr Don McCarthy
---------------	-----------------

Inspiring a Nation: JFK's "Space Speech" 50 Years Ago

Sept 24 (Mon)	Dr Chris Impey
---------------	----------------

How It Began!
(Book signing following lecture)

For more information
http://enterprise.as.arizona.edu/~taf/pubeve/pub_lect.html



CAC RECOGNITION PATIO AND WALKWAY PROGRAM

We are raising money to help pay for the Ramada/Outdoor Education Center at the Chiricahua Astronomy Complex (CAC). The patio will be adjacent to the handicapped parking spaces. The 4x8 brick requires a donation of \$120 and the 8x8 brick a donation of \$150.



Yes, we'd like to reserve a permanent brick. Please engrave our brick as follows:

TYPE WILL BE IN CAPS. ANY SYMBOL IS CONSIDERED ONE SPACE (PERIOD, COMMA, DASH)
ALL TEXT IS CENTERED UNLESS OTHERWISE NOTED

4 x 8 Brick

8 x 8 Brick

4 X 8 EXAMPLE

T	H	A	N	K	S		T	O		B	O	B		S	M	I	T	H	,	
M	Y		A	S	T	R	O	N	O	M	Y		M	E	N	T	O	R	.	
Y	O	U		G	O	T		M	E		S	T	A	R	T	E	D	!		
F	R	O	M		D	I	C	K		A	D	A	M	S						

PLEASE RETURN THIS FORM AND YOUR CHECK PAYABLE TO:

Tucson Amateur Astronomy Association
ATTN: Engraved Brick Program
P. O. Box 41254
Tucson, AZ 85717

Name: _____ Phone: (_____) _____

Address: _____

City: _____ State: _____ Zip: _____

Email Address: _____ Payment Included: _____

If you have any questions, please call Bill Lofquist at (520) 297-6653 or billlofquist@tucsonastronomy.org.

Membership in the TAAA

Annual Fees

Individual membership \$25.00
 Family (includes two adults plus minor children)..... \$30.00
 Youth under 18 years must join as a family upon parental or guardian acknowledgement of participation in TAAA events. Ask the Treasurer for the required form.

Discounts (one qualified discount allowed, subtract from above rates)

Seniors (over 60 years) \$2.00
 College Students, Teachers (K - 12) \$8.00
 Youth under 18 yrs. (form required, contact the treasurer) \$13.00

Options (add to above membership rates)

Astronomical League (AL) fee..... \$7.50
 Sky & Telescope Magazine 1 year (12 issues, group rate)..... \$32.95
 Astronomy Magazine 1 year (12 issues, group rate)..... \$34.00
 2 years (24 issues, group rate) \$60.00
 Postage for New Member Pack \$4.95

Donations are accepted for the following funds: SA-IDA/Light Pollution, TIMPA, Education, Chiricahua Astronomy Complex, and General/Undesignated.

Renewal Information

You'll get an email reminder when it's time to renew.
 TAAA members may join the Astronomical League (AL) at the time they join or renew.
 Discounted Sky & Telescope or Astronomy magazine subscriptions are available to members and can be started or renewed at any time. Allow 3

months for processing. New subscriptions must be sent through the TAAA treasurer. Renewals can be paid online through magazine websites. To change an individual subscription to the group rate, pay the group rate to the TAAA treasurer. Include your magazine renewal notice. Include a note about what you're paying for. Credit cards are not accepted. Write one check or money order for dues plus any options or donations. Make it payable to TAAA and send to: Tucson Amateur Astronomy Association; PO BOX 41254; Tucson, AZ 85717

Mailing Address or Email Changes

Mail changes to address above, email them to the treasurer, or make them yourself online through Night Sky Network login account at <http://nightsky.jpl.nasa.gov/login.cfm>.

TAAA Mission Statement

The mission of the Tucson Amateur Astronomy Association is to provide opportunities for members and the public to share the joy and excitement of astronomy through observing, education and fun.

Desert Skies Publishing Guidelines

Send submissions to [taaa-newsletter\[at\]tucsonastronomy.org](mailto:taaa-newsletter[at]tucsonastronomy.org) by the newsletter deadline. Materials received after that date will appear in the next issue. The editor retains all submissions unless prior arrangements are made. Submissions should be Word compatible files sent by e-mail or on recordable media. All copyrights retained by Tucson Amateur Astronomy Association or specific author. No reproduction without permission, all rights reserved. We will not publish slanderous or libelous material!

How to Contact Us

TAAA Website: www.tucsonastronomy.org Mailing Address: PO Box 41254 Tucson 85717 TAAA Phone Number: 520-792-6414

Office/Position	Name	Phone	E-mail Address
President (elected board member)	Keith Schlottman	520-250-1560	president[at]tucsonastronomy.org
Vice President(elected board member)	Bob Gilroy	520-743-0021	vice-president[at]tucsonastronomy.org
Secretary (elected board member)	Chuck Hendricks	520-247-3815	secretary[at]tucsonastronomy.org
Treasurer (elected board member)	Al Anzaldia	520-409-5797	treasurer[at]tucsonastronomy.org
Member-at-Large (elected board member)	Vern Dunlap	520-326-1964	mal1[at]tucsonastronomy.org
Member-at-Large (elected board member)	Bill Lofquist	520-297-6653	mal2[at]tucsonastronomy.org
Member-at-Large (elected board member)	Tim VanDevender	520-495-0694	mal3[at]tucsonastronomy.org
Chief Observer	Dr. Mary Turner	520-743-3437	chief-observer[at]tucsonastronomy.org
AL Correspondent (ALCOR)	Paul Anderson	520-625-5035	alcor[at]tucsonastronomy.org
Community Event Scheduler	Bill Lofquist	520-297-6653	school-star-party[at]tucsonastronomy.org
Volunteer Coordinator	Bill Lofquist	520-297-6653	school-sp-volunteers[at]tucsonastronomy.org
TIMPA Gate Card Controller	John Kalas	520-620-6502	timpa[at]tucsonastronomy.org
Chiricahua Astronomy Complex Director	John Kalas	520-620-6502	cac-director[at]tucsonastronomy.org
Newsletter Editor	Terri Lappin	520-977-1290	taaa-newsletter[at]tucsonastronomy.org
Web Director	Tim VanDevender	520-495-0694	webmaster[at]tucsonastronomy.org
Publicist	Liz Kalas	520-620-6502	publicist[at]tucsonastronomy.org
Astro-Imaging Special Interest Group (SIG)	Larry Phillips	520-777-8027	astro-photo[at]tucsonastronomy.org
Astronomy Fundamentals SIG	Ben Bailey	520-903-7925	fundamentals[at]tucsonastronomy.org
Family Astronomy Program	Jim Miller		family@tucsonastronomy.org
Starry Messenger SIG	Terri Lappin	520-977-1290	smsig[at]tucsonastronomy.org
Space Exploration SIG	Al Anzaldia	520-409-5797	sesig[at]tucsonastronomy.org
Club Apparel Sales	Mae Smith	520-850-7137	taaa-sales[at]tucsonastronomy.org
Equipment Loan Coordinator	Al Dohner	520-297-7118	elc[at]tucsonastronomy.org
Librarians	Hunter Bailey		librarian[at]tucsonastronomy.org
Grand Canyon Star Party Coordinator	Jim O'Connor	520-546-2961	gensp[at]tucsonastronomy.org
General Information	Keith Schlottman	520-250-1560	taaa-info[at]tucsonastronomy.org



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>

Easy online renewal of discounted subscriptions



Telecons with NASA/JPL Scientists



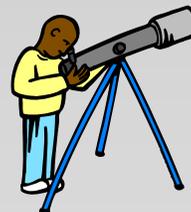
Observing Planning Tools

Planning Tools

- Clear Sky Chart**
Click on your location to check on viewing condition predictions in your area. >>
- Your Weather Forecast**
Type in your zip code or city & state to get your local weather forecast >>
- Sky Chart**
Navigate the night sky. Download a sky chart for the current month. >>
- Maps**
Type in the location address to send your friends to the observing location. >>
- Satellite Sighting**
Choose your state, then city to see when the International Space Station can be seen crossing the sky. >>

Notification of Public Events

Track Your Volunteer Hours & Mileage



Developed and Managed by the ASP



Go StarGaze & Distant Suns Requires iPad or iPhone

Table of Contents

<u>Events & Programs</u>		<u>Miscellaneous</u>	
Apparel	9	Address Changes.....	17
Board of Directors Meeting (Date).....	15	Apparel Assistant Needed.....	2
Book Club.....	3	Board of Directors Meeting (Minutes).....	15
Chiricahua Astronomy Complex Fund Raiser	16	Classifieds	10
Community & Education Events	7	Contact Us.....	17
Fundamentals of Astronomy Class	3	<i>Desert Skies</i> Deadline	4
Meeting Information.....	2	Editor's Message	2
Month in Brief.....	3	Future Dates/Upcoming Lectures	3
Night Sky Network Toolkits	7	Membership Information	17
Special Events (Kitt Peak, Mt Lemmon).....	8, 9, 10	Publishing Guidelines	17
Special Feature—Our Curiosity	13–14	Social Networking.....	5, 12
Special Interest Group Reports/Events.....	4–5	Solar Observing Group.....	4
Star Parties for Members	6	TAAA Website.....	12
Telescope Loaner Program	9	Youth Page	9
<u>Observing</u>		<u>Affiliated Programs</u>	
Constellation of the Month	11	Job Opening—MGIO Assist. Dir.	8
Dark Skies	5	Lunar & Planetary Lab Public Lectures.....	14
Planetary Nebulae of the Month.....	12	Russian Amateur Youth Visit	9
Planets this Month.....	11	Southern AZ Section—IDA.....	9
Website Trips on the Internet Super Skyway	8	Steward Observatory Public Lectures	15