Desert Skies

Tucson Amateur Astronomy Association

Observing our Desert Skies since 1954

Fall 2013 **Volume LIX, Issue 3**

Inside this issue:

Take Note!

- Fundamentals of Astronomy Class offered to members
- Light Pollution News
- 2014 Globe at Night dates
- Open letter of thanks from Grand Canyon Park Service
- Grand Canyon Star Party pictures
- A Grand Canyon Star Party Poem
- Ring Nebula Guide

Mouldy Strawberry and Sharpless 2-265 Nebulae

This is an HaLRGB mosaic of two images, taken by Alistair Symon. The image covers an area near Bellatrix which marks Orion's left shoulder. Appearing on the left is Sharpless 2-265 and on the right is the Mouldy Strawberry Nebula (aka Sharpless 2-263 or Vdb 38). These are HII regions found in the larger Lambda Orionis ring complex. Lambda Orionis (marking Orion's Head) is one of several hot, massive stars which excite the dust in the surrounding area. These objects are about 1300 to 1400 light years away. Alistar used a Takahashi TOA-130 5-inch refractor and an SBIG STL-11000 CCD camera to take this image. The two images required a total of 45 hours of light collection through H-alpha, Clear and R, G, B Filters. Processing was done with CCDStack, Registar and Photoshop CS5. Image copyright © Alistair Symon, used by permission. Learn more about this area at
http://www.nasa.gov/mission_pages/WISE/multimedia/gallery/pia14040.html

Attention Astrophotographers!

Want your astrophotos to appear here? Send them along with a description of the object and how your image was produced to taaa-newsletter[at]tucsonastronomy.org.

From Our President

After what seems to have been a very long monsoon season, I do believe the weather is finally going to settle down and let some cosmic light through the clouds…and there is going to be a lot to see and do this Fall in addition to our own personal observing:

- School Star Parties are returning with the advent of the school year. It is always a rewarding experience and we can use your help.
- Introduction to Fundamentals of Astronomy starts later this month. It is popular with both beginning and seasoned astronomers.
- Arizona Science and Astronomy Expo (ASAE) is coming in November. We will have both a TAAA information booth and SMSIG Activity booth.
- International Observe the Moon Night in October.
- TAAA Holiday Party in December.

The following initiatives are being worked on:

- Revising TAAA Constitution – The Constitution Review Committee has been working hard all year and soon they will submit their recommendations.
- Formalizing and extending our Youth Outreach efforts – We have several different initiatives to reach out to the youth in our communities. We will be formalizing these into a more cohesive and effective program.
- Door Prizes at our monthly meetings – Several members are pursuing the possibility of bringing back the door prizes to our monthly meetings. They will be contacting sponsors for donations.

In addition, there will be work parties for:

- Maintenance at both CAC and TIMPA.
- Taking physical inventory of our fixed assets.

Reaching Out – In the spirit of cooperation, we encourage participation and interaction with other organizations. Here are some of the organizations our members support.

- International Dark Sky Association (IDA) – This organization is working to limit the amount of artificial light that trespasses into our night sky. This is a very important issue that we all need to support.
- Globe at Night – This is a world-wide effort to measure and track the effects of light pollution. Volunteers measure the darkness at specific areas and submit the data to a central data bank.
- Flandrau – The Flandrau Observatory on the UA campus is open to the public at no charge. Volunteers are needed to operate its 16" telescope, and training is provided.
- Project ASTRO – This is a national NASA-supported project which pairs volunteer astronomers with educators. This is a very worthwhile program which reaches into the schools to help motivate students to pursue the sciences.

These are only a few organizations. There are many more that we can and do support. Let me know of others that should be on this list.

As you can see, we have an active Autumn schedule with the Winter and Spring promising to be just as full.

I have outlined what your Board of Directors is planning, but we can't think of everything, so it is important that we have your input. What are we doing right? What are we doing wrong? What aren't we doing that we should be doing? What are we doing that we shouldn't? You may respond to the Board of Directors at taaabod[at]tucsonastronomy.org or to me personally at president[at]tucsonastronomy.org.

Please remember, through understanding, cooperation, enthusiasm and dedication, we can accomplish great things.

Thank you,

BoB Gilroy

TAAA President

TUCSON AMATEUR ASTRONOMY ASSOCIATION T.A.A.A.

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. We fulfill this by providing Astronomy Services to schools, church groups, scout troops, and convention organizers. We support many organizations in the Tucson area that are involved in Science, Technology, Engineering and Mathematics (STEM) programs. Our members enjoy observing the night sky under the dark skies that our observing sites offer. We are an all-volunteer, tax-exempt, non-profit, 501(c)3 organization.

Programs

Introduction to the Fundamentals of Astronomy

Topics Covered

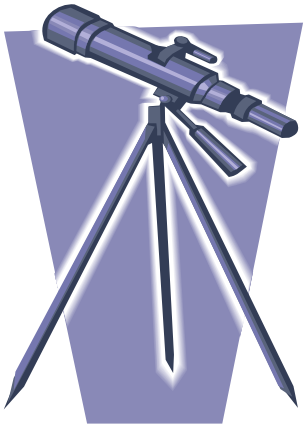
September 28th
celestial motion, the celestial coordinate system, and types of celestial objects.

October 5th
telescopes, mounts, eyepieces, filters, and other observing accessories.

October 12th
locating objects, seeing conditions, and hints and tips on observing various types of objects.

The TAAA Astronomy Fundamentals Special Interest Group (AFSIG) has selected dates for the popular Introduction to the Fundamentals of Astronomy class: Sept. 28, Oct. 5, and Oct 12. This class is aimed at giving the beginning amateur astronomer a good start in the hobby, including the basics of the night sky, equipment, 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 class is open to all TAAA members. Interested individuals can send an email to fundamentals@tucsonastronomy.org or talk to one of the AFSIG Committee members.

The classes will be held at the regular AFSIG meeting location: Room 253 in the USGS building at 6th and Park on the UA campus. Each day will consist of several presentations, with frequent breaks and a break for lunch.



Astronomy Fundamentals Special Interest Group Observing Clubs

- Open to all TAAA members
- Join at any time
- Guided or work on your own
- Certificate at completion
- Stepping stone into the Astronomical League Observing Clubs

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 the Moon 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 Bob Eby at r.eby[at]comcast.net

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 the aid of our observing 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.

Featured Article

Embracing the Dark Side of Astronomy

Contributed by Connie Walker, PhD (NOAO), cwalker[at]noao.edu

A little more than 100 years ago, you could walk out of your home at night and see the Milky Way galaxy arch across the night sky. Being able to see thousands of stars from a truly dark location is part of our planet's natural heritage. Starry night skies were the TV of the past, inspiring artists, composers, and writers; including Van Gogh's familiar painting "The Starry Night;" Holst's orchestral suite "The Planets," and Shakespeare's play "Troilus and Cressida" -- and many more. Our starry night skies are slowly disappearing all over the Earth. By allowing artificial lights to wash out our starry night skies, we are losing touch with our cultural heritage (e.g., what has made us who we are). We are also losing touch with what could inspire future generations.

Vincent Van Gogh's painting "The Starry Night".

Detrimental Effects of Light Pollution

While astronomers need dark night skies to get good observational data, we are also finding that the use of inefficient, unshielded artificial lights is impacting everything from human health to plant and animal ecosystems, and driving up energy consumption and cost. Too much light at night (indoor and outdoor) can have severe health consequences like sleep disorders and ties to cancer. Too much light at night has dire effects on the habits (e.g, disrupting migratory routes of birds) and habitats of animals (e.g. long nose bats). Lighting only where and when you need to, coupled with the use of energy efficient bulbs, can reduce energy costs significantly. Approximately 30% of all outdoor light serves only to light the underside of clouds. Not shielding lights properly (to direct light down to the ground instead of up into space) translates into $2 to $10 billion a year wasted in the U.S. alone.

With more than half of the world's population now living in cities, 3 out of every 4 city dwellers have never experienced the wonderment of pristinely dark skies and maybe never will. So how do you explain to them the importance of what they've lost to light pollution? How can you make them aware that light pollution is a concern on many fronts: safety, energy conservation, cost, health, and effects on wildlife, as well as our ability to view the stars? Finally, how do you convince them that it's worthwhile to take steps, even small ones, to help fix this problem? Your National Optical Astronomy Observatory has created some solutions.

Energy Awareness for a Sustainable Future

In partnership last Spring with Arizona Public Service (APS) and funded by their foundation, the Education and Public Outreach (EPO), staff at the National Optical Astronomy Observatory (NOAO) created the "Dark-Skies Energy Education Program: Energy Awareness for a Sustainable Future." In this program, a number of experienced science and technology education specialists from NOAO led professional development workshops for middle school educators on dark skies and energy education. This in turn culminated in a Family Science Night where students presented their project work. (See http://www.noao.edu/education/video/Dark-Skies-A-Night-of-Light/.) In between these events, our NOAO team provided support for teachers through real-time video conferencing using FaceTime.

Being able to see thousands of stars from a truly dark location is part of our planet's natural heritage.

Dark Skies Outreach to Sub-Saharan

Due to the success of the "Dark-Skies Energy Education Program", NOAO EPO staff created a new project. It is being sponsored by the

(Continued on page 5)

Night Sky Inspiration for the Arts

- Listen to Holst's musical composition, "The Planets" (Click-able link to go to http://www.flickr.com/photos/josefranciscosalgado/3118986543/)
- Shakespeare used of astronomy in his many of his writings. In "Troilus and Cressida", Shakespeare wrote how the Pole Star serves to indicate true north and can act as a guide to travelers on land or sea:

"But I am constant as the northern star,
Of show true-fixt and resting quality
There is no fellow in the firmament.
The skies are painted with unnumbered sparks,
They are all fire, and every one doth shine;
But there's but one in all doth hold his place."

Classroom materials for the "Dark Skies Outreach to Sub-Saharan Africa" project.

(Continued from page 4)

International Astronomical Union's Office of Astronomy for Development, called "Dark Skies Outreach to Sub-Saharan Africa." The project promotes dark skies preservation and energy conservation and is focusing on high school grades. Twelve coordinators, who are mostly physicists, in 12 countries in Africa have each received a teaching kit. The kits have the guides and material resources for classrooms to carry out 6 dark skies and energy education activities, as well as a final project. We use Google+ Hangout sessions to train the coordinators. They in turn teach the teachers, who in turn teach the students, using the activities and materials in the kits.

Globe at Night 2014

The NOAO EPO staff also hosts Globe at Night, an international citizen-science campaign collecting data on light pollution and energy conservation, now in its 9th year. Globe at Night kicks off in January and is offered each month in 2014, for 10 days a month when the Moon is not visible in the early evening. Two new apps will be featured in 2014 as alternative ways to easily measure the night sky brightness. The Loss of the Night app is for visual measurements and can be found at https://play.google.com/store/apps/details?id=com.cosalux.welovestars. For digital measurements, the Dark Sky Meter (DSM) app can be downloaded at www.darkskymeter.com/.

Visual Media Applications

NOAO EPO is also very involved with the annual International Earth and Sky Photo Contest, held during Global Astronomy Month (April). Exceptional photos win every year and give new meaning to "a picture is worth a thousand words". Nearly 700 photos were entered last year. (See www.TWANight.org/contest/.)

NOAO EPO was also very involved in the development of "Losing the Dark" a 6-minute planetarium show that has been translated into a dozen languages so far and been made into flat screen mode for general and classroom use. (See https://www.youtube.com/watch?v=dd82jaztFIo.)

If you would like to join NOAO in embracing the dark side of astronomy, feel free to contact Connie Walker at cwalker[at]noao.edu.

2014 Globe at Night Campaigns

January 20-29	***May 19-28***	***September 15-24***
February 19-28	***June 17-26***	***October 14-23***
March 21-30	***July 16-25***	***November 12-21***
April 20-29	***August 15-24***	***December 11-20***

Featured Article

There's More To Light Pollution Than You Might Think!

Contributed by Joe Frannea, IDA Chapter Leader for Southern Arizona, joe[at]sa-ida.org

Ever mention to someone the importance of dark skies and they promptly tell you they are not really that interested in astronomy or is it really that big a deal? Well, we have a big arsenal at our disposal that will allow you to come at the question of keeping our dark skies from several other directions. There is a compelling reason for most everyone to do something about more sensible lighting once they have a little better understanding of the problem. Good Outdoor Lighting Codes are important but not sufficient; it takes all of us to spread the message.

A few simple things to know to build your arsenal:

Astronomy – It's major industry, including optics, and brings in over $250,000,000 each year to Southern Arizona. We have more professional and amateur astronomers and scopes in Southern Arizona than anywhere else in the US.

Wildlife – All wildlife need light/dark cycles for their health. Outdoor lights disrupt their mating habits, foraging, health, survival, etc. Not only the nocturnal ones, but all animals.

Plant Life – Plants need light/dark cycles too. They shouldn't be growing leaves 24/7 under a light, but need to go into a night cycle to strengthen fiber, initiate the flowering process, etc.

Human Health – Light/dark cycles (circadian rhythm) are crucial and rapid growth of many cancers is attributed to low levels of melatonin which is generated during dark sleep. Your brain organizes its long term memory at night. Lack of regular dark sleep yields jet lag symptoms. Think about how many kids go to school with jet lag because they left their TV or monitor on all night in their bedroom. Night lights should be red for less disruption.

Safety and Security – More light does not make it safer, often causes harsh lighting, and can also give a false sense of security. Using low levels of uniform lighting only when needed is the key.

Saving Energy – Who doesn't want to save energy? But did you know you also save water by keeping lights off at night? Leaving two 60 watt lights on over night requires about nine gallons of water to generate the electricity (coal fired plant).

Our Southern Arizona Chapter of the International Dark-Sky Association (IDA) focuses mainly on education outreach, taking the message about the importance of Dark Skies to anyone that we can reach. Believe it or not, some people have little interest in astronomy and most people think lights at night only affect astronomy. This is why we normally focus on all the topics listed above. Please join us in doing the same.

We have a small brochure that can be used as a handout when talking about "How Light Pollution Impacts Our Environment". This is also a good reference to refresh your memory before the next star party. It is on our web, sa-ida.org or email us if interested in getting some copies for handouts at sky[at]sa-ida.org

Observing

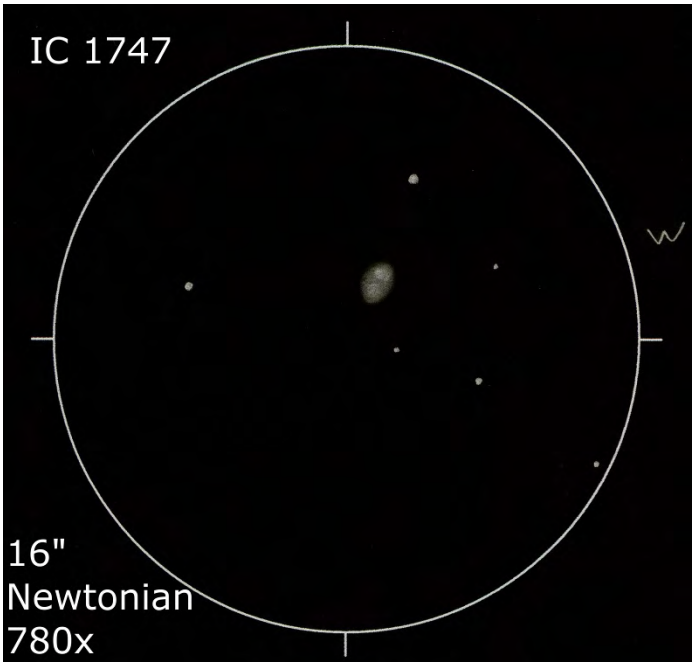
Planetary nebulae of the quarter – Fall 2013

By Christian Weis, weis[at]astroweis.de

Planetary nebulae (PN) are fascinating objects which 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.

IC 1747 is located in the northern constellation Cassiopeia IC 1747. This object was discovered in 1905 by Williamina Fleming. It is quite interesting to read her story. Mrs. Fleming first was the housemaid of astronomer Edward Pickering, but went to work with him at Harvard College Observatory, as Mr. Pickering was frustrated with his male assistants. Legend has it that he said his maid could do a better job (which obviously was correct). The planetary nebula IC 1747 is rather bright but pretty small. You will definitely need some magnification to see a disk. When looking closer, you should also be able to see two brighter spots in the nebula. When I observed it with a 16" Dobsonian from Geology Vista (on the road to Mt. Lemon), I noted: mediocre in brightness, small, no central star, approximately 1:1.3 elongated, SW and NE are a little brighter, [OIII] helps; 780x, fst 6m4 (Gem)

IC 1747
RA: 1h 57.6min
Dec: 63° 19´
Constellation: Cassiopeia
Brightness: 12m
Central star: 15m4
Size: 12 arcsec
Distance: 7000 ly



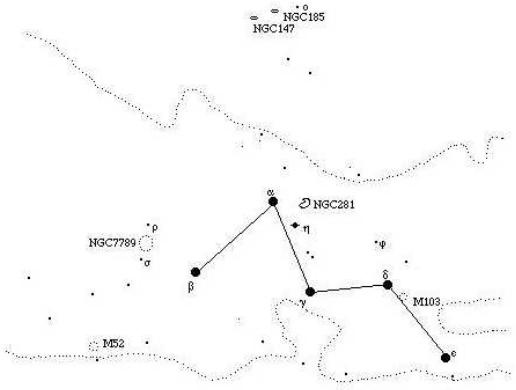
Jones 1 is another planetary nebula that was discovered by a woman (who says astronomy is a male domain, anyways?). Rebecca Jones discovered this object in 1941. It resembles Jones-Emberson 1 (JnEr 1) as it is comparable in size, brightness and surface brightness. To see it, it is advisable to use low to medium power, a filter, and also a black cloth that shields your eye from the ambient light. Also, a dark site will make the difference between seeing and not seeing the nebula, as the surface brightness is quite low. I observed Jones 1 from a mountain in Austria with an 18" Dobsonian having good but not perfect conditions. My notes read: Big, impressive, central star not seen, nebula not seen without filter, reminds me of JnEr 1, two brighter parts in SW and NE, fainter knot in the W, inner part of the nebula is a little brighter than the background, nice object; fst 6m5 (And), 161x

PK 104-29.1
RA: 23h 35.9min
Dec: 30° 28´
Constellation: Pegasus
Brightness: 15m1
Central star: 16m6
Size: 5.3 arcmin
Distance: 2300 ly

Observing

Constellation of the Season
Cassiopeia - The Queen

By Chris Lancaster



Cassiopeia

Queen Cassiopeia plays a part in a complex story, which involves her daughter Andromeda, as well as other mythological characters such as Perseus, Cetus, the gorgon Medusa, and Pegasus. She ruled an ancient land with her husband, Cepheus, until a character flaw resulted in her downfall. This was her boastfulness, which was regarded with much disdain by the gods. To silence her own rants of how beautiful and talented she was, they sent punishment her way in the form of some tragic events. In the end, her country's coast had been destroyed by a sea monster (Cetus), and Cassiopeia herself was chained to a spot in the heavens to forever spin around the celestial pole as if to serve as a spectacle to all.

Despite Cassiopeia's ignoble status among the stars, her constellation lies along the Milky Way, and therefore it contains some wonderful deep sky treasures. A case could be argued for NGC7789 as being Cassiopeia's best star cluster. It doesn't contain any bright stars, but its richness is striking. It appears as a soft, cloudy area of magnitude 6.7 and 16' in size roughly half way between Rho and Sigma Cassiopeiae or RA 23h 57m Dec +56d 44'. Through the telescope, however, it resolves into a spray of hundreds of points of light, each shining at magnitude 11 to 18. The northwest corner of the constellation presents M52. It's comparable to NGC7789 by having over 100 stars of magnitude 9 to 13. You'll find M52 at 23h 24.2' Dec 61.5d, or follow the line formed by Alpha and Beta Cassiopeiae to the northwest a bit further than the distance separating those two stars. If we zoom to the eastern half of the constellation, we'll see M103, another star cluster located at RA 1h 33.2' Dec +60d 42'. This one is quite a bit leaner in the number of stars 1 degree ENE of 2.6 magnitude Delta Cassiopeiae. It measures about 7' in diameter with stars that appear to spiral outward from the center.

To find any galaxies here requires looking away from the obscuring band of the Milky Way. When we move our gaze southward, you may notice that the Andromeda galaxy (M31) lies in the same direction, and we come across two far removed dwarf satellite galaxies of this great spiral. They are about 7 degrees to the north, which corresponds to a true distance from M31 of close to 250,000 light years. If we start at Omicron (o) Cassiopeiae and move one degree west, we find NGC185 at RA 0h 39' Dec +48d 20.3'. NGC147 lies one more degree west at RA 0h 33.2m Dec +48d 30.5'. Both galaxies are small elliptical systems very similar in size and shape: magnitude 10.1, size 12'x 10' for NGC185; and magnitude 10.4, size 13'x 8' for NGC147. To observe either galaxy requires a fair amount of aperture (such as 8") and a dark sky. You will see just a faint brightening of the background sky.

If you are eager for another challenge, then NGC281 is appealing. This is a faint emission nebula 1.7 degrees east of magnitude 2.2 Alpha Cassiopeiae (RA 0h 52.8' Dec +56d 37'). A nebula filter improves your chances of seeing this diffuse cloud of gas of magnitude 7 and spread out over 35' of the sky.

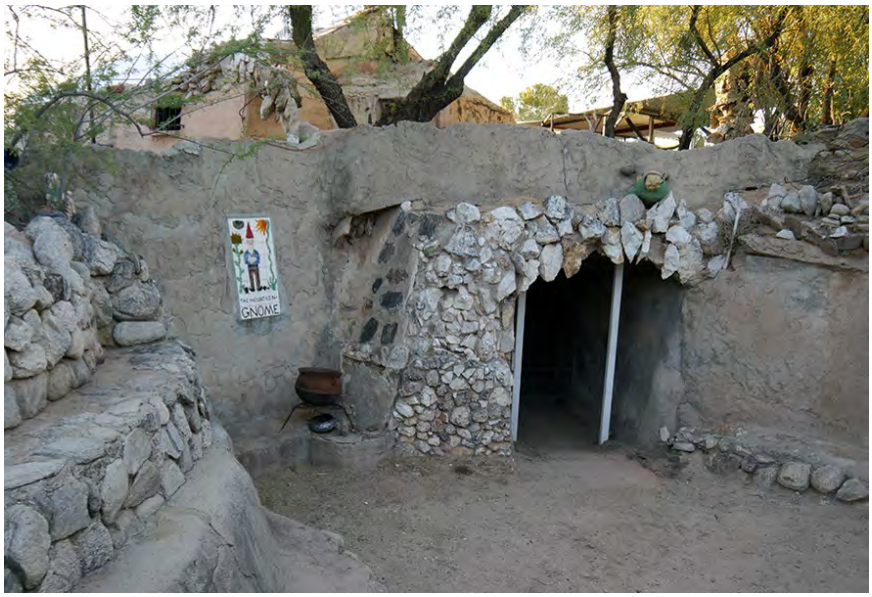
One of the best double stars in Cassiopeia (or anywhere) is Eta Cass. Shining at magnitudes 3.5 and 7.5, they are near maximum separation, currently about 14". Their colors are contrasting white and gold.

Community Involvement & Outreach

Children, Star Parties, and Imagination

Contributed by Jim O'Connor, Grand Canyon Star Party Coordinator, gcsp[at]tucsonastronomy.org
Photos courtesy of Valley of the Moon

A star party for children can be a magical occurrence as the imagination of a child, and often parents, becomes awakened to a part of the universe foreign to their usual experience. Many years ago I was getting kind of bored with astronomy - alone, in the dark, and feeling like something was missing. After I joined TAAA 15 years ago, many opportunities came along to open the sky to others, but at first I couldn't understand the point of looking at the sky under the bright city lights. But I tried a few, and my whole attitude changed. Showing the sky to others opened it up for me, and I've been hooked on public outreach ever since. The night of September 7 was a great example of how imagination in the night can be brought to visitors even without a sky, at a star party that didn't happen in the usual sense, but was a magical occurrence in its own right.



The Mountain Gnome cave where Jim did his story telling.

To make sense of it all, one must be familiar with a Tucson tribute to human imagination, The Valley Of The Moon. It is the vision of George Phar Legler, who began its construction in the 1920s, to quote from the web site http://www.tucsonvalleyofthemoon.com/ "as a unique area appealing to the magical imagination of children and of bringing mental and spiritual relaxation for visitors to the site. Mineralized rock cliffs, caves, pools, and garden miniatures have blended with tropic and desert flora to create what Mr. Legler called the "Fantasy Touch of Three" (Lewis Carroll, Edgar Allen Poe, and Robert Louis Stevenson)". This is a location not to be missed, and only reading the web site will unveil the magic along the walking trails that took George over forty years to build, generally by hand, living on the site in a tiny cave. So many enchanting stops along the walking paths make this a wonderland to visit. Prior to his passing away, George had picked up the label as Tucson's J.R.R. Tolkien. As you wander the trails of this fantasy land near the corner of Prince and Tucson Blvd, you just might run into the signs pointing to Rivendell, or Narnia, or other places of fantasy and imagination.

Zogog's Tower at the Valley of the Moon

TAAA was asked to help with one of the special event nights that occur at Valley of the Moon frequently. Saturday, September 7th, the theme was Magic of Science at the Valley of the Moon. The Physics Factory attended, as did jugglers and fire dancers, and story tellers from around the area. During the day I was in contact with Zack Jarrett, President of the Board of Directors, regarding the weather. Around 4 PM the skies looked almost clearing, but IR satellite and ground radar data showed the sky was about to slam shut. So I emailed the other volunteers and we cancelled the scopes. There was so much other entertainment planned, telescopes would not be missed.

But, knowing as I did that the point of Valley of the Moon is to foster imagination in children (and adults) with a point of view of growth and kindness, I volunteered to add to the science

(Continued on page 10)

(Continued from page 9)

night as a story teller of human imagination and the night sky over the past 7000 years, and how to make the sky their own. What a tremendous experience! I hung out at the cave of the Mountain Gnome, and as folks came through I'd start stories about imagination among cultures and the sky, especially some of the Native American imagination and comparisons of the thoughts of the Chaco culture and the Equinoxes being so important because of the harmony with nature, compared to the Stonehenge and other examples of the European focus on the Solstice, or maxima in their lives. People's faces would light up as they got the point of using their own imagination as George Legler would have encouraged rather than relying on some narrow book learning; the sky is theirs to enjoy. Three and a half hours of enlightenment flew by. We did not need to see The Big Dipper (Revolving Male), Cassiopeia (Revolving Female), and Polaris (the Homefire/Hogan and repository of the goodness of the human spirit) to grasp that in the minds of nomadic Navajo peoples they form a single constellation representing the family and that the circumpolar movement of the structure symbolizes that wherever one wanders, the center of life is the family, the home, and the goodness of the human spirit.

The Physics Factory demonstrations were very exciting - after the main body of the crowd had departed around 9 PM, the physicists built a fire tornado in a tall screen cylinder. With some of the children who knew the ropes of Valley of the Moon and were dressed as fairies and other magical characters, this is one magical place to visit. Please check out the web site; learn why it is a special place to bring children and visitors. And don't forget to look for the lucky pennies.

The "East Entrance to George's Caves"

I later heard from Zack that visitors were hunting him down and very excited about the different point of view of looking at the night sky with imagination, even though we were totally overcast. We who are familiar with the night sky always have an opportunity to open children's minds to the night sky with imagination, as Bob Gilroy does with the Family programs, Terri Lappin and the Starry Messengers, Bill Lofquist and Don Cain starting up an astronomy club at a local school, Paul and Cathy Anderson in Green Valley, and so many others in our club supporting Project ASTRO. To quote Paul Lorenz from several years ago, "You never know what one life you'll touch."

Valley of the Moon

is open on the 1st Saturday of the month around sundown for special family-friendly community events.

Classifieds

For Sale	i-Optron 8802 80mm f/5 refractor on an alt-az mount with GPS. Hardly used. Includes SmartStar® CubeTM-G Mount with built-in GPS and hand controller, two eyepieces (10mm & 25mm), 3X Barlow Lens, 45° Diagonal, tripod tray, AC adapter. Sky & Telescope listed this as a "Hot Product" in 2008. The owners manual can be found at http://ioptron.com/images/up/g-series.pdf Amazon sells this telescope for about $400, used price $350. Asking price is "Best Offer". Contact Larry at 602-663-3361 or Adele at 602-663-3362.
For Sale	Complete CGE 1400 telescope; includes C-14 OTA, mount and field tripod. Purchased new in 2006, original owner. Excellent optics, Fastar compatible. Price: $3750 negotiable. OTA has an 11 x 70 Takahashi finder with illuminated reticle on a custom dovetail mount-perfect match to the long focal length of the C14. Also has Starizona rotating diagonal holder which works well. Scope is located in Tucson, AZ. I will not ship this scope, but will deliver to Phoenix or southeast Arizona if required. Also available as a separate item is a super pedestal with casters and leveling feet that interfaces to the CGE 1400 electronics pier. This allows the scope to be rolled out of a garage or storage building and set up in minutes. Ron Price 520-404-6993.

Ads will appear in a single quarterly issue of *Desert Skies*. Submitters may request that their ad be repeated in the following issue of *Desert Skies* provided the request is made by the issue deadline.

Community Involvement & Outreach

United States Department of the Interior
NATIONAL PARK SERVICE
Grand Canyon National Park
P.O. Box 129
Grand Canyon, Arizona 86023

August 10, 2013

2013 GCSP Participants
c/o Jim O'Connor of TAAA

Dear Grand Canyon Star Party (South Rim) 2013 Participants:

THANK YOU ALL for making the 23rd annual Grand Canyon Star Party another great success! Once again you all educated and inspired huge numbers of visitors from around the globe. They appreciate it and so does the National Park Service.

Having some spots dedicated to videoscopes this year was a very successful experiment, making the telescope viewing more accessible to wheelchair users AND all those who for whatever reason have trouble seeing things in an eyepiece or wandering through a telescope lot at night. Thanks so much to Jim/Susan/Karina/Stephen O'Connor, Wayne Thomas, Bill McDonald, & John Suscavage for providing that service!

I have finally tallied the Contacts and Hours forms that were turned in (THANK YOU!), and I did some extrapolating to fill in the gaps. Attendance was down compared to last year, thanks to the early dates and some cloudy nights. But visitor-astronomer contacts were impressive nevertheless: it appears that with shorter lines visitors had time to look through more telescopes, making it a great experience for those who did attend.

Thanks to Marie Cloutier, Joanne Archinal, Jan Cossette & Daisun Wagner for helping me get an actual visitor count on two nights (442 on cloudy Wednesday night and 967 on the mostly clear final Saturday). And EXTRA special thanks to the indispensable and indefatigable O'Connor clan (Karina & Stephen & Jim & Susan), for all you did to make things run smoothly, despite low staffing this year on the NPS side!

- **Total night and day astronomer-visitor contacts: 47,062** (vs. 62,748 in 2012); 43,239 by night and 3,823 during the day
- **Estimated total nighttime attendance** (at 7.16 scopes each, compared to 5.85 last year)**: 5,871** (vs. 9,758 in 2012); **plus 3,058 by day** at an estimated 1.25 scopes each, (vs. 6,484 in 2012: I miss you Sim Picheloup!).
- **Total slide show attendance: 1,848** (full every night)
- **Constellation Tour attendance (at 9:00, 9:30 & 10:00 pm nightly): 754**, compared to 882 in 2012. Thank you Jim O'Connor, Alan Delman, Joe Orr & Tyler Nordgren for doing most of those—with stars or without!
- **100 volunteer astronomers donated 2,381 volunteer hours with 34-44 telescopes set up each night.**

Looking specifically at your stat sheets:

- Art Cloutier is the new champ for total reported visitor contacts, with 1,782 over the course of 6 nights and 2 six-hour days.
- Diane Hope is runner-up with 1,724 contacts over the course of 7 nights.
- Dennis Young clocked the most hours: 104 ¾ over 8 nights and 6 days.

(Continued on page 12)

(Continued from page 11)

A big thanks to everyone for your work presenting slide shows (Jim, Dennis, John Anderson, Marilyn Unruh & Jocelyn Layte), running the shirt shop (Mae Smith), passing out star charts & tickets for the telescope giveaway (various O'Connor progeny), designing the logo (Joe Bergeron), serving as social coordinator (Ginger Applegarth), organizing social events (Susan & Jim O'Connor, Steve Ratts, Ginger & Alan) and the campsites (Bill & Mary Lofquist), getting us two Celestron Firstscopes to give away to two happy kids (Kevin LeGore) in addition to many gorgeous photographs given to non-telescope winners (Dennis), helping to figure out the new layout (Larry Cossette and Jim & Susan Knoll) and assisting in all sorts of other ways (so many of you!).

And of course thanks to ALL of you for setting up your scopes and sharing them patiently and enthusiastically with visitors, not to mention getting yourselves here in the first place. Your time and energy was well spent in touching lives and making new converts to amateur astronomy and the preservation of dark night skies!

I think my favorite visitor comment this year came one July day when a lady spotted Dean Ketelsen's GCSP t-shirt at a Trader Joe's in Tucson:

- **"Oh my God, we were at the Star Party! It was the highlight of our summer!"**

Of course I also enjoyed the comment overheard by one of my co-workers, from a girl around age ten:

- **"Wow, they must be making a lot of money at this thing!"** ☺

Well done, everyone.

Mark your calendars for **June 21-28, 2014** – the 24th Annual Grand Canyon Star Party! I hope to see you all then.

Sincerely,

Marker

Ms. Marker Marshall
Park Ranger—Interpretation
Grand Canyon National Park
(928) 638-7830
marker_marshall@nps.gov

Solar Video observing from Kaibab Learning Center Day Care

Training the Park Rangers on using a telescope.

Photos Courtesy of National Park Service and Jim O'Connor

Grand Canyon Stargazing July 2013

A Poem written by Mary Lilly McMacken

It begins, the sky, filled with clouds,
The parking lot, filled with telescopes,
Astronomers of all ages set up,
Excited to share their passion.

Chatter, greetings, laughter,
We are here, racing to get ready,
The wind picks up, dancing, laughing,
Stealing hats and sky charts.

The melting sun throws buckets
Of orange and purple hues, on the clouds,
Drenching them, pulling them slowly
Beneath the horizon line.

Venus comes out of hiding, bright,
Winking through the shivering atmosphere,
Bringing hope Mercury will soon follow,
And the wind will soon fade…….

The wind laughs softly then giggles,
Sending hair across faces,
Grabbing the "How to" booklet for the new telescope,
Taunting as we race to grab it back.

Mercury blinks in and out, teasing the eyes.
It's almost there, then gone again.
It's almost dark enough when, it appears,
A shimmering smile in the telescope lens.

Visitors come drifting up eager to see
Beyond this tiny ball we call our home.
Smiling they stand in line, waiting
To be pulled into another dimension.

Vega shows its face, a new target.
The wind persists, voices grow in volume
A steady rising hum, "Do you want to see…
Vega, Venus, Saturn, Mercury?"

"Yes, thanks, sure, . . Ahhhh it's awesome."
A young man says, "You hear about
The Grand Canyon, but when you get here…
It's unreal." He looks up at the star filled sky
Spreading his arms as if he would embrace it.
It's yummy dark now. The wind is moving slowly,
The laser pointers shoot green lines in all directions.
Teaching constellations, stars, planets.

"Look, there, green light points, can you see
Arcturus the brightest star in Bootes, Saturn…..?"
"Oh my god, a voice almost sings,
"I've never seen the Ring Nebula before!"

Now, the night sky is velvet black dark.
"What," a voice asks, "you've never seen it"
The Milky Way, a magical cloak drapes
Across it "hiding billions of sister stars"

The stars, never seen this bright at home,
Have multiplied, over and over, so many times,
Blinking, shimmering, filling the sky,
"Making the constellations hard to find."

The wind has given up, no fun left to be had,
The hum of the voices have trickled to a soft purr.
I look around, where did they all go, the visitors?
Back to hotel rooms, RV's and camping tents?

Ah yes, It's time to put the telescopes away.
We help friends, old and new pack up,
It's time to leave but we will be back tomorrow night
For the delight, the passion, lingers on and on and
on…….

Preparing for a night of observing with visitors from all over the world at the Grand Canyon National Park

Grand Canyon Star Party 2014 June 21 - 28

Photos Courtesy of National Park Service and Jim O'Connor

Astronomy Education Help Sheet

Looking Down the Barrel of Gas at a Doomed Star

A Hubble Space Telescope Image of M57, the Ring Nebula

Contributed by Loretta McKibben, tucsonastronomer[at]gmail.com

From: http://hubblesite.org/newscenter/archive/releases/1999/01

Astronomers using the Hubble space telescope obtained the image at right in October, 1998, the sharpest up to that date of the glowing loop of gas called the Ring Nebula, also called Messier 57 (or "M57"). This object was first cataloged more than 200 years ago by French astronomer *Charles Messier,* who also compiled the list of "Messier Objects," or a list of bright, fuzzy celestial objects in the night sky. (*Note: "Nebula" means "gas cloud."*)

The ring shape was caused when the shells of gas and dust spread almost evenly into space after they were flung off of the star. The exposure time for this image was one hour; in other words, the telescopic camera was allowed to gather light for that long to create the image. Long exposure times are necessary for objects that are very dim and/or very far away.

The Hubble's images revealed that the "Ring" is actually a cylinder of gas seen almost end-on! In other words, it is like looking through the end of a drinking glass, it looks round from one view but has length to it. Such shapes are common among other planetary nebulae, as well as hour-glass shapes, because thick disks of gas and dust form a waist around a dying star. This "waist" slows down the expansion of material ejected by the doomed object. The easiest escape route for this cast-off material is above and below the star. This photo reveals dark, elongated clumps of material embedded in the gas at the edge of the nebula; the dying central star is floating in a blue haze of hot gas.

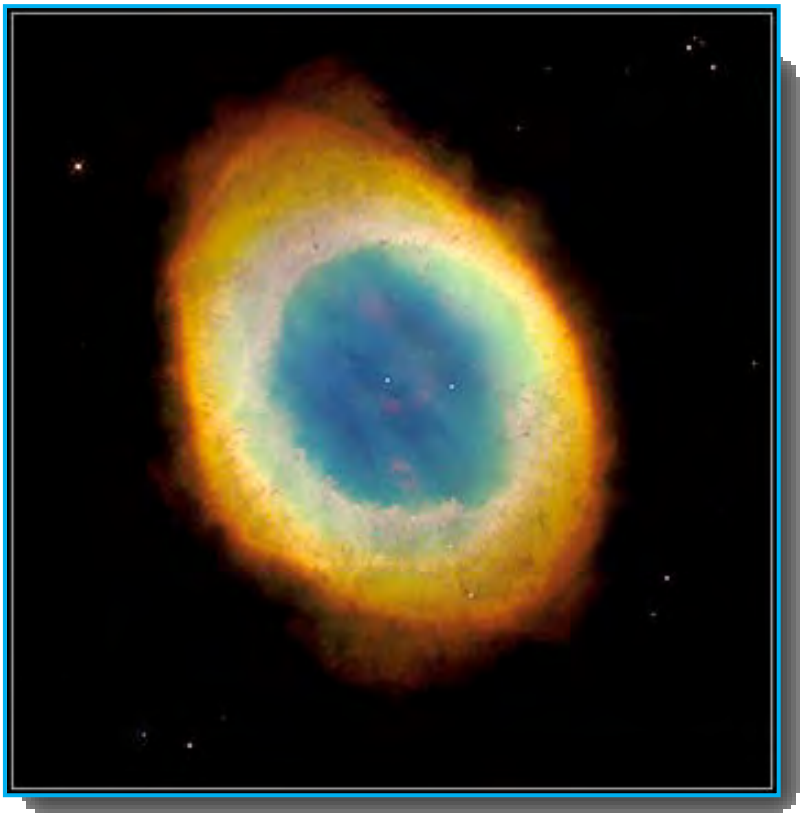


Image of the Ring Nebula taken in October, 1998, by the Hubble Space Telescope's Wide Field Planetary Camera 2 (WFPC 2). Exposure time is one hour.
From: http://hubblesite.org/newscenter/archive/releases/1999/01

The colors in the image are almost "true" colors. The color image was assembled from three black-and-white photos taken through different color filters with the Hubble telescope's Wide Field Planetary Camera 2 (WFPC2). Blue shows areas with hot helium, which is mostly located near the hot central star. Green represents ionized oxygen, which is located farther from the star. Red shows ionized nitrogen, which is radiated from the coolest gas, located farthest from the star. The gradations of color illustrate how the gas glows because it is bathed in ultraviolet radiation from the remnant central star, whose surface temperature is a white-hot 216,000 degrees Fahrenheit (or 120,000 degrees Celsius).

Handout created by L. McKibben, NASA/JPL Solar System Ambassador
Contact: tucsonastronomer@gmail.com
Version 1.0, February 10, 2013
Content is adapted from The Hubble Site, http://hubblesite.org
For educational use.
Image Credits: NASA/Hubble Space Telescope/WFPC2
Reformatted to fit the page.

Board of Directors and Appointed Leaders

Office/Position	Name	Phone	E-mail Address
President (elected board member)	Bob Gilroy	520-743-0021	president[at]tucsonastronomy.org
Vice President (elected board member)	Jim O'Connor	520-546-2961	gcsp[at]tucsonastronomy.org
Secretary (elected board member)	Chuck Hendricks	520-247-3815	secretary[at]tucsonastronomy.org
Treasurer (elected board member)	Andrew Rich		treasurer[at]tucsonastronomy.org
Member-at-Large (elected board member)	Al Anzaldua	520-409-5797	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)	Mae Smith		mal3[at]tucsonastronomy.org
Immediate Past President	Keith Schlottman	520-250-1560	
Membership Coordinator	Vern Dunlap	520-326-1964	membership[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
Publications Editor	Terri Lappin	520-977-1290	taaa-newsletter[at]tucsonastronomy.org
Web Director	Tim Van Devender	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
Starry Messenger SIG	Terri Lappin	520-977-1290	smsig[at]tucsonastronomy.org
Family Astronomy Program	Jim Miller		family[at]tucsonastronomy.org
Club Apparel Sales	Mae Smith	520-850-7137	taaa-sales[at]tucsonastronomy.org
Equipment Loan Coordinator	OPEN		elc[at]tucsonastronomy.org
Librarian	Hunter Bailey		librarian[at]tucsonastronomy.org
Grand Canyon Star Party Coordinator	Jim O'Connor	520-546-2961	gcsp[at]tucsonastronomy.org
General Information	Bob Gilroy	520-743-0021	taaa-info[at]tucsonastronomy.org

Publishing Guidelines

Desert Skies is published quarterly, near the dates of solstice and equinox. The deadlines for publication are March 1st, June 1st, Sept 1st, and Dec 1st. Submissions should be emailed to the editor at taaa-newsletter@tucsonastronomy.org. Submissions should be in the form of a text or Microsoft Word compatible file. Photos and artwork are encouraged. Please send these as separate attachments with resolution of at least 200 dpi (higher is preferred). Submissions are retained by the editor unless prior arrangements have been made. Copyrighted materials will not be accepted unless permission to use is clearly stated. We will not publish slanderous or libelous material! All copyrights retained by Tucson Amateur Astronomy Association, Inc. or the original author.

Contacting the TAAA

Editor: taaa-newsletter@tucsonastronomy.org Board of Directors: taaabod[at]tucsonastronomy.org
Website: www.tucsonastronomy.org Phone: 520-792-6414 Address: PO Box 41254, Tucson AZ 85717

Desert Skies is published quarterly by the Tucson Amateur Astronomy Association, PO Box 41254, Tucson, AZ 85717.