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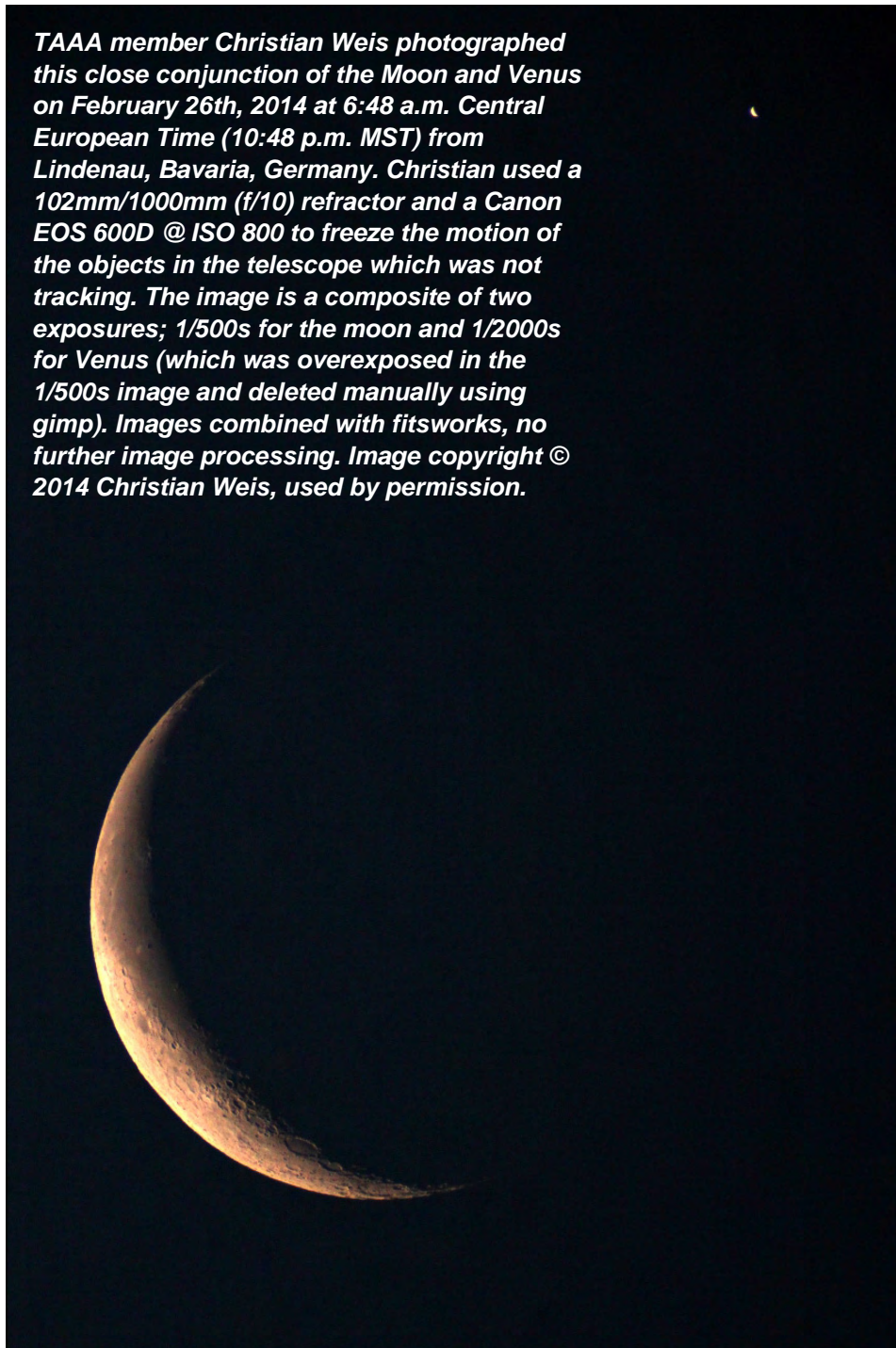
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## Take Note!

- ♦ 60th Anniversary Celebration Photos
- ♦ CAC Report
- ♦ Make your Globe at Night Observations

## The Moon and Venus at Conjunction

*TAAA member Christian Weis photographed this close conjunction of the Moon and Venus on February 26th, 2014 at 6:48 a.m. Central European Time (10:48 p.m. MST) from Lindenau, Bavaria, Germany. Christian used a 102mm/1000mm (f/10) refractor and a Canon EOS 600D @ ISO 800 to freeze the motion of the objects in the telescope which was not tracking. The image is a composite of two exposures; 1/500s for the moon and 1/2000s for Venus (which was overexposed in the 1/500s image and deleted manually using gimp). Images combined with fitsworks, no further image processing. Image copyright © 2014 Christian Weis, used by permission.*





## From Our President

Many things have happened already this year and I want to take a few minutes to bring you up to date on what we have been doing and what our focus will be over the next few months.

We adopted our new bylaws in January which will allow us to move confidently forward into the future – and from what I see, the future looks very promising. We just observed our 60<sup>th</sup> Anniversary and we have come a long way since 1954 thanks to some great leadership and enthusiastic member participation! We hit a few bumps along the way. Most recently we had an issue with the treasurer's position that morphed into a membership issue. However, I am happy to report that both issues are being addressed. We recently hired an outside bookkeeper to do two things: One, make our data file simpler to use while accomplishing the tasks we need to do more effectively and efficiently; and two, make sure that there will be no issues when we get our external audit later this year. In addition, we have a membership chairman who has taken on the challenge of keeping the website current.

In Mid-January, your board of directors held a special meeting to plan our leadership strategy for the remainder of this fiscal year and lay the groundwork necessary for multi-year projects. I will keep you updated as we go along.

### ➤ Some of our short-term projects are:

- *Member Feedback* - We are doing several things to make it easier for you, our members, to communicate and give feedback to the board of directors and our project leaders.
  - ✓ We will have a suggestion box for members to make suggestions, comments and ask questions.
  - ✓ Everyone on the board of directors will wear name tags on a lanyard so that they can be easily identified. Our other leaders will be encouraged to wear them. In addition, there will be blank labels for our members and visitors who want to use them.
  - ✓ Your suggestions, please.
- *Local Dark Sites*
  - ✓ TIMPA – Currently our only official local TAAA dark site and it is on the far west side of Tucson. People on the far east side of Tucson have to travel an hour or more to get to it.
  - ✓ TRCC (Tucson Radio Control Club) – This site is similar to our TIMPA site but located southeast of Tucson at Valencia and Houghton. TRCC has given us permission to use this site. TAAA board of directors is checking out the suitability of this site

for our use.

✓ Your suggestions.

- *Outreach* – In an effort to create greater public participation in our events we will be hosting more events on a monthly basis as well as on a quarterly basis
  - ✓ Inviting the public to specific monthly star parties at both TIMPA and CAC.
  - ✓ Coordinating at events at state parks. We are doing this already at Catalina State Park. We will seek to expand this to other parks and with other organizations.
  - ✓ Offering the use of our TIMPA dark site (and eventually CAC) to specific to specific teachers (Project Astro) for customized astronomy events.
  - ✓ We will continue to support other projects we have in the past (i.e. Sharing the Sky, Festival of Books, Science Fair, etc.).
  - ✓ Your suggestions, please.

### ➤ Some long-term projects are:

- *Greater Membership Participation* - We have a lot of members who live out of town who are unable to attend our meetings. In addition, there are times when a member would like to attend a specific meeting, but cannot for whatever reason.
  - ✓ Live Electronic Attendance for monthly general meeting - In an effort to accommodate these members, we are pursuing the possibility of making our meetings electronically available. Our regular meeting room N210 is already equipped with the equipment we will need and we are in discussions with the University of Arizona. They have agreed to allow us to use this equipment. So, over the next several months we will be testing this out and asking for your feedback.
  - ✓ Ride-share Program – Many of our members cannot get to meetings because they do not have transportation... or cannot drive at night. We need to do this not only for our general meetings, but for all of our activities.
  - ✓ Your suggestions, please.
- *Fundraising* – Until now, we have been relying on members and friends for all of our funding needs. If we are to grow and be recognized as a world class organization, then we need to expand our funding sources.

(Continued on page 3)

(Continued from page 2)

- ✓ Grant Writing - In the near future we need to start applying for grant funding. We will need to set this up properly with all the necessary controls – it is not a simple project – and we will definitely need help. I am calling on our members who have experience in this area to step up and help us here. This is a very important task and needs to be done right if we are to succeed. WE NEED YOU!
- ✓ Other Sources – We need to consider and cultivate other sources of funding if we are to progress the way we need to.
- ✓ Your suggestions, please.
- *Logo and Identification for TAAA* – In an effort to get better known, we will be looking to standardize our logo and initiate a long-term project to develop awareness of the Tucson Amateur Astronomy Association and the outreach events in which we sponsor and/or participate in. In addition to helping our organization grow and prosper, this could be a tremendous aid in our fundraising efforts.

Mark the date of May 2<sup>nd</sup> 2014 on your calendar – this is a very important date. It is the date of the General Meeting where you, the

members, will elect your next board of directors. The Nominating Committee consists of Dr. Mary Turner, Dennis McMacken and Sara Liberty-Laylin. You will have already been contacted at least once to give you the opportunity to serve on the governing board of Tucson Amateur Astronomy Association. Please take inventory of your abilities and skills and how you can use them to further the goals of this organization.

If you are not in a position to serve on the board of directors, please consider serving on one of our many committees or volunteer for some of our astronomy events. As I mentioned earlier, we need you!

We are continuing to move forward... and with your help we will be a World-Class Organization.

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

*Robert Gilroy*

*TAAA President*

*president[at]tucsonastronomy.org*

## Grand Canyon Star Party

June 21—28, 2014

### South Rim Star Party and Lodging Information

<http://tucsonastronomy.org/gcsp-2>

### North Rim Star Party Information

<http://www.saguaroastro.org/content/2014GrandCanyonStarPartyNorthRim.htm>

If you intend to participate in the 2014 Grand Canyon Star Party, email your intentions to Jim O'Connor at [gcsp\[at\]tucsonastronomy.org](mailto:gcsp[at]tucsonastronomy.org) or phone him at 520-546-2961.

## TAAA 2014 Wall Calendar

Need help keeping track of our events? There are still 2014 calendars available at the monthly meetings. Visit the apparel table to find them.

Cash and checks only (payable to TAAA).

**\$10 each**



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.

## Community Involvement & Outreach

### *TAAA Exhibits at UA Science City during the Tucson Festival of Books*

Text by Terri Lappin, [terrilappin@tucsonastronomy.org](mailto:terrilappin@tucsonastronomy.org), Starry Messenger SIG Chairperson

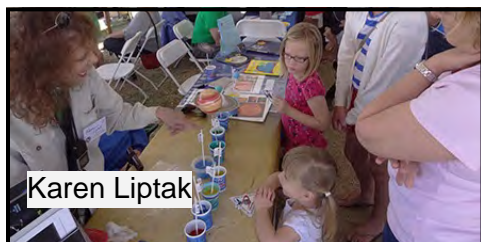
Photos by Terri Lappin and Gary Rosenbaum

March marks the beginning of a series of annual outreach events, starting with an exhibit at the UA Science City during the Tucson Festival of Books. This was a two-day event attended by about 120,000 people. Our exhibit about exoplanets explained how these distant planets are found and what astronomers can learn about them. This year, we collaborated with graduate students at the Lunar & Planetary Lab, who shared first hand experiences about how data are analyzed, and some of their results.

We also had several scopes set up for solar observing. The Sun cooperated by giving us a nice display of sunspots and prominences. One group of visitors even witnessed a flare event on Saturday morning. There were both white light and H-alpha scopes set up. Jim O'Connor had a live video image of the sun making it possible to describe the solar activity to groups of visitors.

This year we offered custom made temporary tattoos to the kids. This tattoo featured an actual photo of the Sun in H-alpha light taken by Kitt Peak docent Ron Cottrell. Local artist Marty

(Continued on page 5)



Karen Liptak



Jim O'Connor



Lois Connell



Robert Wilson



Our newest addition to our exhibit, a 14-foot tall, double-sided flag inviting the public to view the Sun.



Our custom designed temporary tattoos were a big hit with the kids.

(Continued from page 4)

Heinritz designed the tattoo which was manufactured by Tattoo Manufacturers here in Tucson. The tattoos were a huge hit with the kids, especially after seeing an image of the sun that was very similar to the image used in the tattoo.

New to our exhibit this year was a 14-foot tall teardrop shaped flag inviting the public to view the Sun. This flag will be used at other public solar events.

Fifteen TAAA volunteers, along with several boy scouts, helped with our exhibit. Over 4000 interactions took place during the event. Slightly more visitors looked through the telescopes than visited our booth. By the end of the event, most of us had hoarse voices, but I think all of us were glad to have participated.

Future outreach activities are Sharing the Skies on April 5th and Astronomy Day on May 10th. Join the Starry Messengers Special Interest Group in planning these events. The Starry Messengers SIG meets every other month. Our next meeting is on May 19th at the Beyond Bread on Campbell at 6:30p.m. If interested in getting involved with these events now, contact Terri Lappin.



**Lunar & Planetary Lab graduate students explain how a planet's spectrum is used to determine the characteristics of an exoplanet.**

### *Counted Interactions*

Saturday: 1736

Sunday: 2274

*Grand Total 4010*

(57% at scopes, 43% at booth)



**Ed Foley**



**Joe Statkevics**



**Susan O'Connor**



**Janet Connell**



**Jim Knoll**



**Terri Lappin**

### Thank you Volunteers!

Cathy Anderson

Paul Anderson

Janet Connell

Lois Connell

Ed Foley

Chuck Hendricks

Jim Knoll

Terri Lappin

Karen Liptak

Brian O'Connell

Jim O'Connor

Susan O'Connor

Gary Rosenbaum

Joe Statkevics (and boy scouts)

Robert Wilson

## Community Involvement & Outreach

### TAAA Honors Science Fair Exhibitors

Text by Terri Lappin, [terrilappin@tucsonastronomy.org](mailto:terrilappin@tucsonastronomy.org), Starry Messenger SIG Chairperson

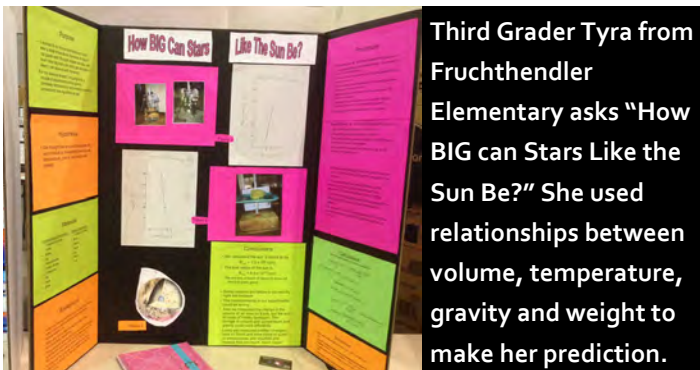
Photos by Mary Helen Kaser

Each year, the TAAA presents awards to deserving young people who exhibit an astronomy related science fair project during the Southern Arizona Research, Science and Engineering Fair (SARSEF). This important program encourages young people to develop critical thinking skills, scientific methods, and communication skills. The members of this year's TAAA Award Committee were Molly Hancock, Mary Helen Kaser, and Brian O'Connell. Judging began at 7am and ended about 2pm after interviewing high school and middle school students.

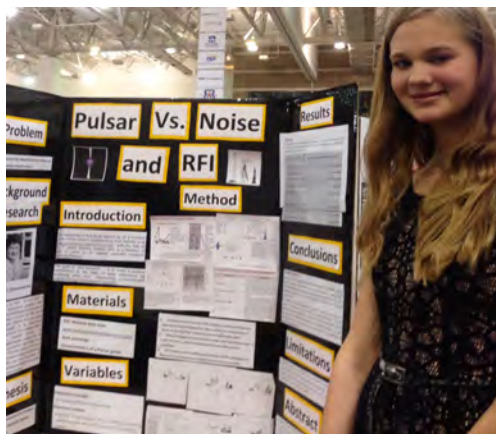
Since 1955, the SARSEF is administered by the [SciEnTek-12](#) Foundation, a local 501(c)3 non-profit organization. What began with about 100 exhibits by young people, has grown to 1800 exhibitors. SciEnTek-12 also organizes other education outreach programs like the annual Math, Science and Technology FunFest in which the TAAA has participated.



The 2014 Southern Arizona Research, Science and Engineering Fair exhibition at the Tucson Community Center. About 1800 exhibits by young people were displayed.



Third Grader Tyra from Fruchthendler Elementary asks "How BIG can Stars Like the Sun Be?" She used relationships between volume, temperature, gravity and weight to make her prediction.



Through the Pulsar Search Collaboratory, sixth grader Alyssa from Circle Cross Ranch K-8 identified a pulsar out of a dataset of 8 pulsar candidates.



Jose, a high school student at Carpe Diem Academy in Yuma, AZ reviewed implications of Stephen Hawking's conclusion that event horizons around black holes are only apparent and do not really exist.

# TAAA's 60th Anniversary Celebration!

Text contributed by Liz Kalas, lizkalas[at]cox.net  
Photos by Gary Rosenbaum



On Sunday, February 16th, eighty-one members celebrated the TAAA's 60th Anniversary with a celebration party held at the University of Arizona's Michael Drake Building. The festivities started at 2 PM with a delicious buffet provided by Blue House Catering. The speakers were excellent and held us captivated for the rest of the afternoon. On behalf of the TAAA, I would like to thank Dolores Hill, Dr. Thom Fleming, Tim Hunter and David Levy for making the celebration a very memorable occasion. We also need to thank the University of Arizona and the people at OSIRIS-REx for allowing us to use the room at the Michael Drake Building. Another highlight was the collection of club photos Susan O'Connor arranged and copied to DVD for showing on a big screen TV. It was fun to see the old and new TAAA! Thanks Susan! The proof is in those pictures that our TAAA at 60 years old is still going strong! Let's celebrate the anniversary all year long.



Dolores Hill, TAAA Member and Co-Leader of the OSIRIS-REx Target Asteroids! citizen science program, presented a lecture about OSIRIS-REx. Dolores was recently honored by the White House for her work in this project.



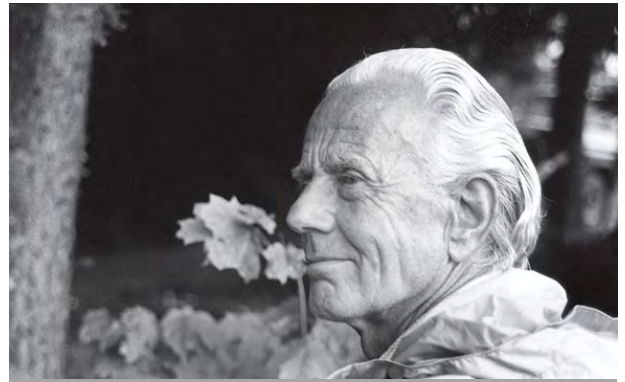
Dr Thom Fleming, astronomer from Steward Observatory, gave a lecture about the history of astronomy in Arizona including the establishment of both Lowell and Steward Observatories.



Drs David Levy (left) and Tim Hunter (right), both current TAAA members and Past Presidents, were our co-masters of ceremony for the event. Both offered their perspectives on TAAA over the years.

## *John Dobson - Amateur Telescope Maker and Observer Extraordinaire*

Text by Wayne Johnson, mrgalaxy[at]juno.com



John Dobson 1915 - 2014

The amateur astronomy community was saddened to hear that the irascible old man of amateur telescope making and popularizer of using those scopes, John Dobson, passed away January 15, 2014 at the ripe, young age of 98.

John was an engaging personality who was a favorite guest of talk show host Johnny Carson (an amateur astronomer himself). Dobson considered the Bay Area around San Francisco as his home, and it is there that he and a few friends founded the San Francisco Sidewalk Astronomers (later shortened to Sidewalk Astronomers).

John was a chemist by training and worked for the military for a short time but was disillusioned with that way of life and became a Buddhist monk for about twenty years. He came from an erudite family; his grandfather founded Peking University in China's capitol city.

I was fortunate to know John fairly well from his many trips to the Los Angeles area when I lived in southern California (as I jokingly like to say) "for twenty years too long". I would call his Los Angeles representatives to arrange for him to give talks at a few local astronomy clubs to which I belonged, including the annual RTMC (Riverside Telescope Makers Conference), which many TAAA members have attended. When the Sidewalk Astronomers attended gatherings like the RTMC and the Grand Canyon Star Party, which was founded by our own Dean Ketelsen they would bring their huge telescopes, some big enough to sleep in!

It was fun watching John in action, always high energy when observing. It was especially instructive watching his telescope making classes/expositions where he would make an entire, functional telescope, optics and mount, in one day! His style was low-tech, mostly by necessity, which made his telescope mounting accessible to amateurs of all economic levels. The Dobsonian mount's azimuth axis rotates on a used 33rpm record (remember those?!). His telescope mounts were altitude-azimuth in operation, based, ironically, upon the gun mounts that he saw on battleships.

John would always come with a small entourage who transported him and handed out material for him. He was very simple in his almost non-existent demands as a

speaker. He wouldn't accept any honorarium and usually refused being taken out to dinner since his typical diet consisted of a hard-boiled egg and yogurt.

John's usual topic was on the "Apparitional Universe", discussing how appearances (real or imagined) affect our view of the Universe. Who knows, he could have been on the right track: some theoreticians currently suggest that our Universe is a hologram, which I certainly hope is not right!

*When you lay down on the ground, and think about it as looking up into the sky, instead, think about it as looking down into the sky.*

*- John Dobson*

He had an interesting presentation style. He would typically begin his talk with: "Any questions?". Of course, no one knew what to ask so he just started with his spiel. At some point during his talk he (or his helpers) would throw flyers out into the audience which advertised his series of talks being given at the Vedanta Society where he stayed when in LA.

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John Dobson, pictured here with TAAA member Carter Smith, taken at the home of David and Wendee Levy.

*Editor's Note: for Dean Ketelsen's tribute to John Dobson check out The Ketelsen's Blog for January 15th, 2014, <http://theketelsens.blogspot.com/> (search for John Dobson)*

## Programs

# Astronomy Fundamentals Special Interest Group Observing Clubs

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

**Lunar Observing Club** meets sporadically depending on schedule compatibility and the lunar 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](mailto: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](mailto: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](mailto: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](mailto:watson1987[at]cox.net).

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The last time I saw John was about eight years ago when I made it a point (along with many other amateurs) to attend his 90th birthday celebration in San Francisco. One of the most interesting perspective-changing statements I recall of his was: rather than, when you lay down on the ground, and thinking about it as looking up into the sky, instead, think about it as looking down into the sky.

If you want to know more about John Dobson, there is a biography by former Sky and Telescope magazine editor, Norm Sperling, that, appropriately enough, has 1/4-inch plywood front and back covers.

The Dobsonian Telescope revolutionized amateur astronomy. The design was inherently stable and easy to construct using simple tools. Owning large aperture, portable telescopes became possible without the need to invest thousands of dollars.



## Programs

### *Recent Improvements at Chiricahua Astronomy Complex*

Text and Photos by John Kalas

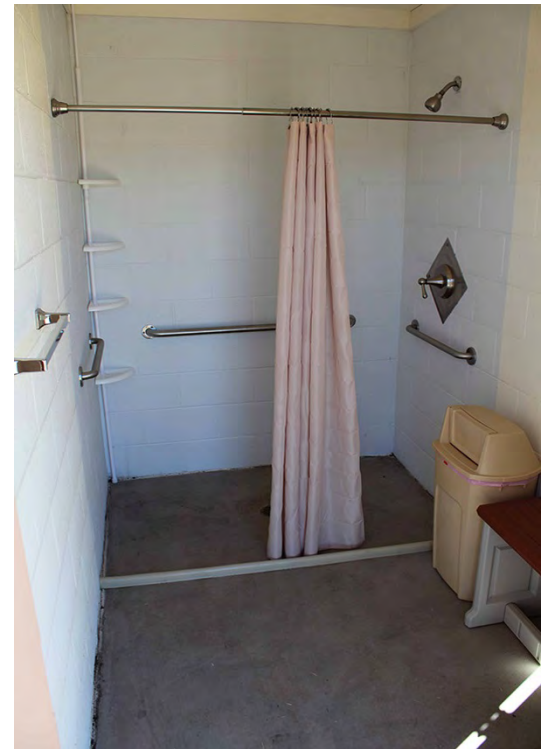


It has been a while since my last update. We've had quite a year at the Chiricahua Astronomy Complex (CAC). Several improvements have been accomplished and the next phases of development are underway.

This past year, the weed issues at the site were severe. The weeds got way ahead of us and it took several months to clear the site, particularly the graveled areas; entry road, parking lot and the RV Area. We had to bring a landscaper in to mow the grassy areas on several occasions. We now have our own mowing capability. In June we will be contracting the landscaper to apply pre-emergent chemicals to prevent the explosive seed growth that we experienced this year.

The recent improvements include the completion of the shower room in the bathroom facility. Numerous small improvements have been made to the Roll-off Roof Observatory to develop it into a really nice facility. The latest improvement is the addition of a custom-made dust cover/bag for the C-14 telescope. My wife, Liz, constructed the bag which includes the club logo. It replaces the old, clear plastic bag in which the scope was originally packaged. Mike Magras proposed the idea of, and has assumed the responsibility for, a training program for TAAA Members in the use of the RoR Observatory and telescope.

Bill Lofquist continues to coordinate the Engraved Brick Program. We currently have enough funds to pursue the construction of the engraved



**The recently completed Shower Room at the TAAA Chiricahua Astronomy Complex.**



**Liz Kalas crafted a cover for the TAAA Celestron C-14 at the Chiricahua Astronomy Complex, complete with the TAAA logo.**

brick patio along with the adjacent concrete slab for the future ramada. When completed, this facility will give the club a great place for outdoor education, picnicking and general socializing. It will be a much-needed improvement to the complex. The initial building permit application has been submitted and our contractor is updating his quotes. As soon as these tasks are completed, we will construct the engraved brick patio. Additional funds are required to erect the steel ramada, so if you haven't purchased a brick yet, now is a great time to do it. We really need your help.

Preparations for the development of the Member Pads Area are being finalized. About ten members have already placed down payments on member pads. As soon as the final quotes are received, the total cost for each pad will be established. Once interested members submit their payments, the construction of

*(Continued on page 11)*

(Continued from page 10)

this new phase will commence. The Member Pad Area, which has the capacity of 45 pads, will be expanded in sections as more members become interested in having their own telescope pad.

Another project in the works is the Large Roll-off Roof Observatory. This facility will be a bigger version of our current 12'x14' RoR Observatory and may be as large as 16'x32' with a warm room at one end of the building and room for four telescope piers. TAAA Member, Wally Rogers, has generously committed \$10,000 as a challenge grant for this structure. In order to fully benefit from this grant, members need to contribute enough funds to match Wally's offer. If you are interested in supporting this facility, please consider making a contribution to the project.



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## Classifieds

**For Sale: Celestron NexStar 8 telescope** in good condition. Not used in last four years. Features GoTo mount. Can look up planets and deep sky objects using the key pad and it tells you what you are looking at. Runs on both 12 volts or 110 VAC house current. Two eyepieces: 40mm Celestron Plossl (model 93346) and Vixen 31.7mm (model 3865). Tripod has aluminum legs. Purchased new in 2001 for \$1500; asking price \$400 or best offer. Contact John at 520-722-4199 or jesdgs[at]gmail.com.

**For Sale: Stellarvue 102D (4") Refractor**, excellent glass, comes with a custom case, retailed originally for over \$900, will sell for \$360 or best offer. Contact Allen Klus tel. 520-360-4760.

**For Sale: Meade 8" Schmidt-Cassegrain (Model 2080)** includes Model 39 Dec Motor, A/C converter, 2" diagonal, SLR camera attachment, Meade Super Plossl 26mm eye piece and original storage "trunk"; \$800 or best offer. Contact Joe Grisillo at 2sonjoe[at]att.net or 863-414-4301.

**For Sale: Observing chair**, white with adjustable height seat, collapses for easy transport. Asking \$60 Contact John at 520-722-4199 or jesdgs[at]gmail.com.

**For Sale: Astro Physics 155 EDF** Includes: AP Case, 4" Focuser and Extender Tube, 4" Field Flatteners, 2" TeleVue Everbright Diagonal, Early Kendrick Dew Zapper System - Controller, 2", 3" and 6" Heater Bands, AP 80mm F1 900mm Guide Scope, Mounting Rings for both Scope and Piggybacked Guide Scope, Vernonscope 2" 2.4X Barlow. Photos available. Asking \$10,000. Located in Pearce, AZ; will not ship. Contact Ed Erbeck Jr. at Ed@CrazyEdOptical.com or 520-826-1464.

**For Sale: Three Mike Spooner Primary Mirrors** ① Astrosital 8" F-6 for \$525, slight "scratch" that will be shadowed by the secondary); ② Pyrex 8" F-7 for \$500, scratch which Mike stated didn't effect Star Test. The Tube has a Secondary mounted to a Circle Spider with Diagonal Mirror already mounted and has a hole for a 2" Focuser; ③ Pyrex 10" F-5.45 for \$750. Mike's comment written on back of Mirror states "Superb Star test ~ 1/12 lambda." All The Mirrors are Mounted on Spooner made Push / Pull Cells. All of these come with a 5' Aluminum Tube (ok, section of irrigation pipe) 12" dia. for the 10 and 10" dia. for the 8's, AstroSystems Spider to fit the Tube, 1.25" Crayford style focuser (Astrosystems type 1 style, but not from AstroSystems), ~12" X 1" strip of Teflon you can use for Bearings if you want to build a Dob. If I have the size you need, a Diagonal Holder from AstroSystems. And if you want it a signed copy of Don Machholz's "Messier Marathon Observer's Guide Handbook And Atlas. Located in Pearce, AZ; will not ship. Contact Ed Erbeck Jr. at Ed@CrazyEdOptical.com or 520-826-1464.

**For Sale: Complete Mike Spooner Scope**, It Is a 10" F-6, has a Spooner Circle Spider with mounted Secondary, Spooner made 2"/1.25" Crayford Focuser and Spooner Mirror Cell. Ok it ain't pretty but is sure provides nice views. Asking \$875. Located in Pearce, AZ; will not ship. Contact Ed Erbeck Jr. at Ed@CrazyEdOptical.com or 520-826-1464.

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# Observing and Imaging

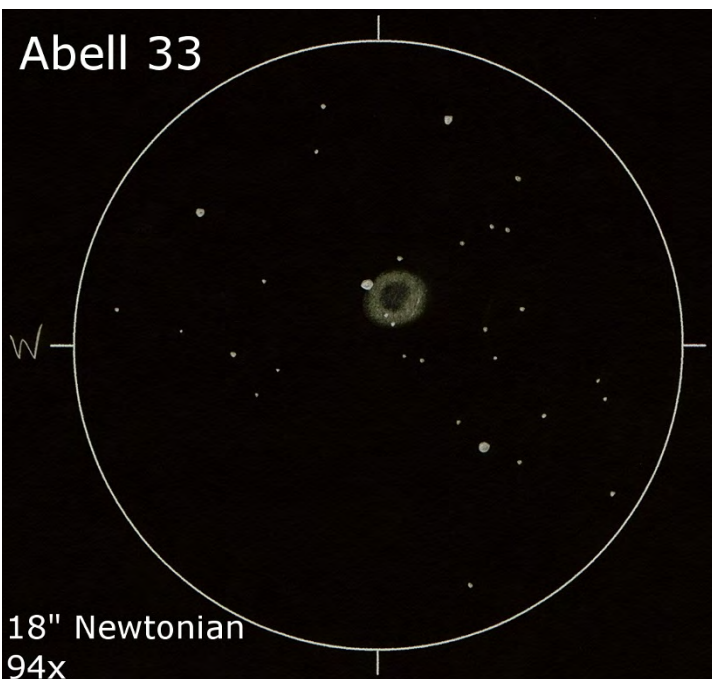
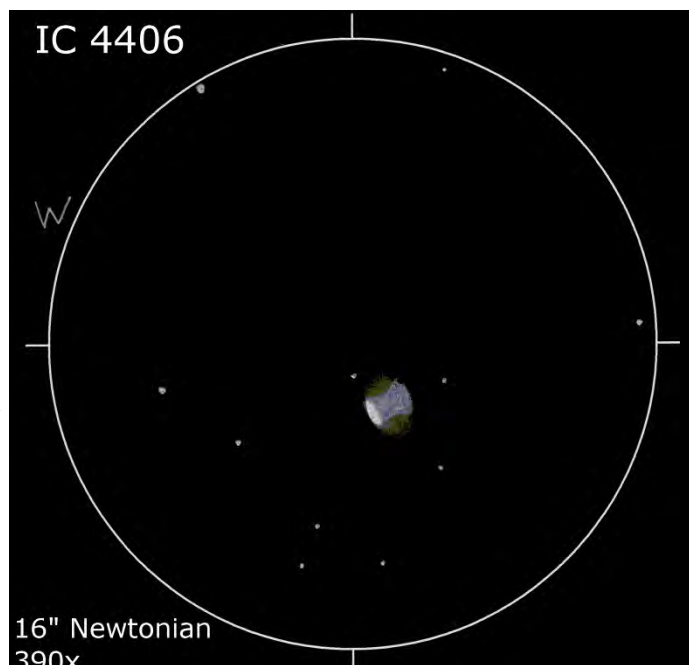
## Planetary nebulae of the quarter – Winter 2013

By Christian Weis, [weis\[at\]astroweis.de](mailto:weis[at]astroweis.de)

Planetary nebulae (PN) are fascinating objects which come in numerous forms or 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 4406 is quite a bright planetary nebula situated in the southern constellation Lupus (the wolf). This object was discovered in 1901 by the American astronomer Williamina Fleming – the first woman to be elected honorary member of the Royal Astronomical Society. IC 4406 is also called the retina nebula and has a somewhat rectangular shape. I observed this nice nebula in May 2012 from Kitt Peak with a 16" Dobsonian telescope. It was quite windy so I only used moderate magnification (390x) and noted: Quite bright, elongated from east to west but brightest parts are in the north and south. It reminds me of the Dumbbell Nebula. The northern part appear brighter with an [OIII]-filter; no central star seen, 390x, fst 6m6 (Vir).

**IC 4406**  
RA: 14h 22.4min  
Dec: -44° 9'  
Constellation: Lupus  
Brightness: 11m  
Central star: 17m0  
Size: 46x30 arcsec  
Distance: 4,900 ly



Abell 33 (PK 238+34.1) was discovered by George Abell who published a list of 86 planetary nebulae in 1966. He described it as a homogeneous disk with marked deviation from perfect regularity or symmetry. Interestingly, that description is kind of misleading as the nebula shows a nice ring structure in a bigger telescope. I observed Abell 33 in February 2011 with my 18" Dobsonian from a mountain in the Austrian Alps having nearly perfect conditions. This planetary nebula reminds me a lot of NGC 2438, the PN in the open cluster M 46. I noted: Kind of big but easily visible using a UHC or even better with an [OIII]-filter. Round shape, ring structure with averted vision, in the east the ring protrudes a little into the center which is brighter than the background, no central star; wonderful object! 94x, fst 7m2 (UMa)



**PK 238+34.1**  
RA: 9h 39.1min  
Dec: -2° 48'  
Constellation: Hydra  
Brightness: 13m4  
Central star: 14m7  
Size: 4.5 arcmin  
Distance: 2,000 ly

# Observing and Imaging

## Constellation of the Season: Virgo - The Maiden

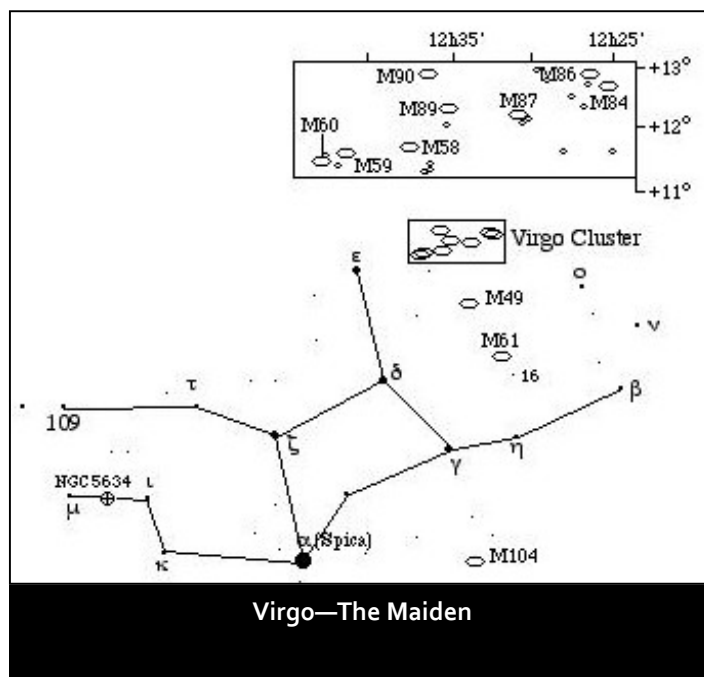
By Chris Lancaster

Throughout the millennia, Virgo has been seen as a female representing many different goddesses in various ancient cultures. Among them are Ishtar, the goddess of fertility in ancient Babylonia; Isis, goddess of nature for the Egyptians; Astraea, Roman goddess of justice; the terrible Gorgon Medusa; an Anatolian goddess of the Earth called Cybele; and various Greek goddesses such as Artemis, the Moon goddess; Athena, goddess of wisdom and war; Demeter, Greek goddess of agriculture; and her daughter Persephone. The brightest star of Virgo, the hot blue star Spica of spectral type B1, is traditionally depicted as the stalk (or "spike") of wheat the maiden is holding in her left hand.

Virgo is synonymous with galaxies, but before we delve into these, let's start with NGC5634, a magnitude 9.6 globular cluster sitting midway and slightly below a line connecting Iota and Mu Virginis (RA 14h 29.6m Dec -5d 59'). This is a fairly bright globular visible even through Tucson's light polluted skies, but rather small at 4.9' across. Through most amateur telescopes it appears as a soft glow sitting within a triangle of dim stars.

Now then, beginning our tour of galaxies we can start with M104, a wonderful edge-on spiral popularly called the Sombrero Galaxy. It is in a fairly empty part of the sky on the boundary between Virgo and Corvus. You can sweep 11.1 degrees west of Spica to find it or center your scope on RA 12h 40m Dec -11d 37.3'. A well-defined dark lane around its large central bulge pierces its ghostly 8.3 magnitude glow. Any telescope will provide a breathtaking view of this galaxy.

Moving north we will see M61. It's perhaps not quite as striking as M104, but still spectacular nonetheless. Start at Eta Virginis, move north 4



degrees to the 5th magnitude star 16 Virginis, and then 1.2 degrees NNE to M61 (RA 12h 21.9m Dec +4d 28.3'). What you will find in M61 is a magnitude 10.1 face-on galaxy with a compact, almost stellar nucleus, with spiral arms forming a broad patch of light measuring 6.5'x 5.8'.

Those of you with large apertures may see a curious feature about

(Continued on page 14)

### Summary of Virgo's Messier galaxies

M86: This is a bright elliptical at RA 12h 26.2m Dec +12d 56.8', shining at magnitude 9.8.

M84: 17 arc minutes southwest of M86 at RA 12h 25.1m Dec +12d 53.3'. A similar elliptical of magnitude 10.

NGC4388 is a magnitude 11.9 edge-on spiral to the south forming an equilateral triangle with M86 and M84.

M87: Another elliptical, magnitude 9.6, at RA 12h 30.8m Dec +12d 23.4'. Two very small galaxies to the southwest can be seen in the same field.

M90: RA 12h 36.8m Dec +13d 9.8', magnitude 9.5. An elongated spiral with dusty mottling.

M89: RA 12h 35.7m Dec +12d 33', magnitude 9.8 elliptical.

M58: RA 12h 37.7m Dec +11d 49.2', magnitude 10.6. A spiral not quite turned face-on to us.

M59: RA 12h 42.1m Dec +11d 38.8', magnitude 10.6. An elliptical galaxy elongated north-south.

M60: RA 12h 43.7' Dec +11d 33'. Bright elliptical of magnitude 9.6. A 12th magnitude spiral, NGC4647, borders M60 3' to the northwest.

(Continued from page 13)

M61's arms. Instead of following graceful curves, they show sharp corners like the bend of an elbow and produce a distorted diamond shape for the galaxy.

As we get closer to the core of the Virgo galaxy cluster we see M49 4 degrees NNE of M61. Here is a bright (mag 9.1) elliptical system. Its center fades to its edges forming an oval measuring 10.3'x 8.4' at RA 12h 29.8' Dec +7d 59.96'.

The best sights in Virgo await us in the galaxy cluster, which spills into the neighboring constellation of Coma Berenices to the north. There are actually some members of the cluster that extend as far north as Canes Venatici and south into Corvus. The most concentrated section of the cluster, which also contains the largest, brightest galaxies, is about 9 degrees west of Vindemiatrix, Epsilon Virginis. For casual observing, it's not even necessary to know which galaxy is which (because that can even be quite a challenge!). Simply sweep your telescope through the cluster and admire galaxy after galaxy that come into view.

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## In Memoriam



It is with great sadness that we announce the death of two long time TAAA members: Lee Paulsel and Robert Callanan.

Lee Paulsel (left), passed away on February 20th. He died of cancer. He was a member for about 8 years and was active in Project ASTRO for 5 years. He was also a Kitt Peak docent and had attended the UA Astronomy Camp. A memorial service will be held at St Andrews Presbyterian Church on April 5th at 1 p.m.

Robert Callanan passed away on March 15th. After retiring, Robert and his wife Barbara lived in Saddlebrook. Robert served as a Member at Large on the TAAA Board of Directors for a few years. Robert was also involved with the Vatican Observatory Foundation and the International Dark-Sky Association. More recently, he and Barbara had moved back to Shaumburg, Ill but still maintained their TAAA membership and visited the Tucson area often. Services are planned in Illinois, but Barbara is planning a Tucson memorial service probably in May

## A History Lesson

The TAAA's 16-inch telescope was under construction in the 1970s, with plans to mount it on a large German Equatorial mount. It appeared in the August '76 issue of *Sky & Telescope* with then TAAA Vice President Tom Caudell (later President) and member John Figoski after they mounted it temporarily in a Dobson style mount. Later it was placed at Vega-Bray Observatory in Benson, AZ on a German Equatorial mount. There it was dedicated as the Van Biesbroeck Telescope in honor of the famous UA LPL astronomer who used the optics (which are still owned by the UofA). Following Dr Vega's untimely death, it was removed from the Vega-Bray Observatory and now sits in storage at TIMPA.



Work on the German Equatorial Mount  
(l to r) Duane Niehaus, Scott Henning, Gary Rosenbaum  
(in tube), and Paul Lorenz



Van Biesbroeck Telescope Dedication  
(l to r) Dr Ray White (with hat), Dr Tom Gehrels, Dr Tim  
Hunter, Dr David Levy

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### Publishing Guidelines

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