



FOCUS

Vol. 62, No. 7, SEPTEMBER, 2017

DELAWARE ASTRONOMICAL SOCIETY

Monthly Meeting – Tuesday, September 19th, 2017 at 8:00pm

Topic: “Eclipses”

Speakers: – DAS Members: If you have some eclipse infos - general info, past cool eclipse trips, or a cool trip from the August eclipse, consider sharing your story with the club at the June meeting.

At the Mt. Cuba Astronomical Observatory

FROM THE PRESIDENT--Rob Lancaster

Welcome back from an exciting summer with the Great American Solar Eclipse of 2017! We had DAS club members spread all across the country in the path of totality including the states of Idaho, Wyoming, Missouri, Illinois, Tennessee, North Carolina, and South Carolina. Many of our club members joined up with families and friends, particularly those who live close to the eclipse path, with some of them extending their eclipse vacations to include botanical gardens, museums, national parks, and other exciting sights. Nearly all who went came back raving about how awesome it was, particularly the beauty of the prominences and corona that were visible to the naked eye! A large number also came back with excellent photographs to remember the event for years. Here in Delaware, a partial eclipse was still visible and several of our members brought out solar telescopes and assisted with local events, including one at Brandywine Creek State Park where around 1,500 people were in attendance! Some of our members encountered bad weather, but as far as I can tell, most of us lucked out on Eclipse Day. I hope everyone enjoyed it!

At our September meeting this year, we will be focusing on club members' stories from Eclipse Day. Due to the fact that a very large number of DAS members enjoyed the event and have great stories to tell, we will forego the What's up and Beginners Corner segments to allow more time for eclipse stories. Also to expedite and facilitate the process, we are going to try to collect a few photos and/or videos from each person who saw the eclipse and put them all in one big presentation. We would also like to prepare a map with pins on it showing where our members were set up for the eclipse. Please email your photos/videos to Jeff Lawrence along with your location information for inclusion in the presentation. Also, please be sure to include interesting photos of your surroundings, equipment, and yourself observing if possible, along with a few of your best shots of the eclipse.

We have an exciting year planned. Jeff, our Vice President, has already scheduled a number of exciting speakers for the next several months. We are also planning on having quite a few member star parties and outreach events. As usual, every Tuesday at 7 pm we have the informal "Astronomy Workshop" gatherings at Mount Cuba where you can pursue your interests in astronomy. To find out more about all the exciting events we have planned, please check out the DAS Calendar on the website (<http://delastro.org/events/calendar>). To volunteer at any of our events, please (continued on Page 2)

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Each issue of FOCUS is full of useful hyperlinks. Just click on any graphic or telltale blue web address and your browser should take you to additional linked web resources.

Observing with the Delaware Astronomical Society

From the President (continued from Page 1)

send a reply when that event's coordinator sends a request for help to the DAS Yahoo Group. If you would like to get involved, host an event, build your own telescope, or volunteer in any way, please feel free to contact one of your board members. Also feel free to come to one of our board meetings, which are typically held one hour before our regular monthly meetings. All members are welcome!

Let's have a great year!



09/19/17 DAS Board Meeting Agenda

1. Review of Minutes from Last Meeting—Bill McKibben
2. Treasurer's Report—Diana Metzger
3. Budget for 2017-2018 Fiscal Year—Diana Metzger
4. Lock for the Sawin—Jeff Lawrence
5. Update about the new scope focuser—Bill Hanagan
6. Update on 17.5" shed —Bill McKibben
7. Update on Club Equipment—Jack Goodwin
8. Update on Sawin Improvements—Dave Groski
9. Update on Pods, Decks, and Workdays—Jeff Lawrence and Dave Groski

"PUBLIC NIGHTS" at the Mt. CUBA OBSERVATORY...

MCAO PUBLIC NIGHTS *Greg Weaver*



The Mt. Cuba Observatory Public Nights continue year round! In addition to learning about many aspects of the heavens, you'll have a chance to visit and view our all-digital full-dome planetarium. You can pick up a schedule when you next come to a meeting or get the latest updated version off the website at: <http://MountCuba.org>. Programs are presented on Monday nights at 8pm. Please check the website for full details and

updates on programs planned. Interested individuals or groups can apply by letter or call 654-6407 (preferably between the hours of 9 and 11 am, Monday through Friday) to the Observatory to obtain reservations for these "Public Nights".

Public Nights schedule for 2017:

Date	Speaker	Topic
25 Sept (8:00pm)	Sheila Vincent	Tales of the Night Sky
9 Oct (8:00pm)	Carolyn Stankiewicz	Differences and Similarities Between Astronomy and Astrology
23 Oct (8:00pm)	Bill Hanagan	How to Choose Your First Telescope
6 Nov (8:00)	Stan Owocki	"Ask an astrophysicist absolutely anything about astronomy and astrophysics"

Upcoming Events and Activities Extended

Check out the website at <http://www.delastro.org/> for ALL of the upcoming events and activities. There's PLENTY going on, so be sure you're informed and don't miss something that would interest you and your relation to the Heavens above!

SAWIN OBSERVATORY REMINDER AND DAS LOANER TELESCOPES AND EQUIPMENT *Bill Hanagan*

The DAS owns and maintains The Sawin Observatory on the grounds of the Mt. Cuba Astronomical Observatory. The Sawin Observatory houses the club's equatorially mounted 12.5" reflecting telescope. The Sawin is also currently home base for our 17.5" split-tube Dobsonian telescope.

DAS members can obtain a key for access to the Sawin Observatory by being checked out on these telescopes and the use of the observatory. Naturally, all DAS members are invited to look through these telescopes during our Member Star Parties (MSPs) at the Sawin. DAS members who are interested in becoming key holders of the Sawin Observatory should contact Greg Lee to receive training in the use of the facility and the telescopes. See more information on Page 24.

LOANER TELESCOPES and EQUIPMENT

80 mm Celestron Refractor (on loan from Bill McKibben)

The club currently has on loan from our Secretary, Bill McKibben, an 80 mm Celestron Refractor with a Nextar GOTO mount. Contact Bill McKibben if you would like to give this scope a try.

6" Orion Dobsonian Telescope

We have a 6" Orion Sky-Quest XT6 Dobsonian reflector, complete with eyepiece set, available for loan to members. You can keep the telescope out on loan for a month or more. However, we use this telescope heavily for outreach star parties at the Woodside Farm Creamery, so if you have it on loan from April through October you may be asked to bring it out to one or more of these events.

Meade 8" LX-10 Telescope

We also have an 8" Meade LX-10 Schmidt Cassegrain Telescope (SCT) available for loan. This telescope is equipped with an equatorial wedge and is driven in Right-Ascension only. If you have any thoughts about buying a telescope, especially an SCT, you are strongly advised to take this one out on loan so you can learn the advantages and disadvantages of this design.

Barlowed Laser Collimator Toolset

Also available for loan to DAS members is Howie Glatter's version of the Barlowed Laser Collimator. This is actually made up of a set of three very nice tools: 1) a 1.25" Glatter laser collimator (which is useful on its own for collimating the secondary mirror); 2) a 1.25" "TuBlug", which converts the straight beam laser collimator into a "Barlowed" laser collimator, complete with a target screen that's visible from the back end of your Newtonian telescope; and 3) an Orion 2" to 1.25" centering adapter for use with 2" focusers.

Along with the center donut or triangle on your Newtonian primary mirror, a Barlowed laser collimator is a very accurate and incredibly easy way to collimate your Newtonian or Dobsonian telescope. It may sound complicated, but using the Barlowed laser collimator is incredibly quick and easy compared to earlier generations of collimation tools. As one person noted "It's one of the handiest and most useful tools the club has ever offered for loan to the membership!" Obviously, no one DAS member can keep these collimation tools out on loan forever, but borrowing this set of tools is a great way to become familiar with the new "Barlowed Laser Collimator" approach to collimation without having to buy the tool set sight unseen.

If you're interested in borrowing any of the club's loaner telescopes or other items, please contact Bill Hanagan, Jeff Lawrence, or Greg Lee at one of our monthly meetings.

DAS FORUM / E-MAIL SITE ON YAHOO

This is a restricted e-mail service for use by DAS members for DAS purposes. To use this site, go to <http://groups.yahoo.com>; search for Delaware Astronomical Society; and click on the link that comes up. To join, you must have a Yahoo ID and password; if you don't, you can register at this time by following Yahoo's instructions. You will then be allowed to "Join the group" upon clicking in that box. You must then register for the DAS group and add your profile by clicking on "add new profile" and completing the form

When adding or editing your profile, you will need to enter your actual name in the "Real Name" box so you can be identified as a DAS member so Don Shedrick can approve your application to join the DAS group, and everyone will know to whom they are communicating.

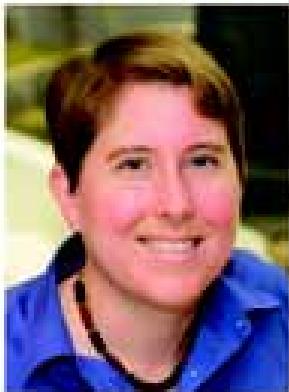
Finally, specify your desired email address for delivery of messages. Note: You may choose to not have your name and email address displayed to any-one other than DAS members who are members of the Yahoo DAS email group.

For more detailed instructions, go to the DAS website under *DAS Resource Links*.

HARCOURT C. "ACE" VERNON MEMORIAL LECTURE

Tuesday, October 3, 2017 | 7:30 PM
Clayton Hall Conference Center

Preparing to Explore the Universe with the James Webb Space Telescope

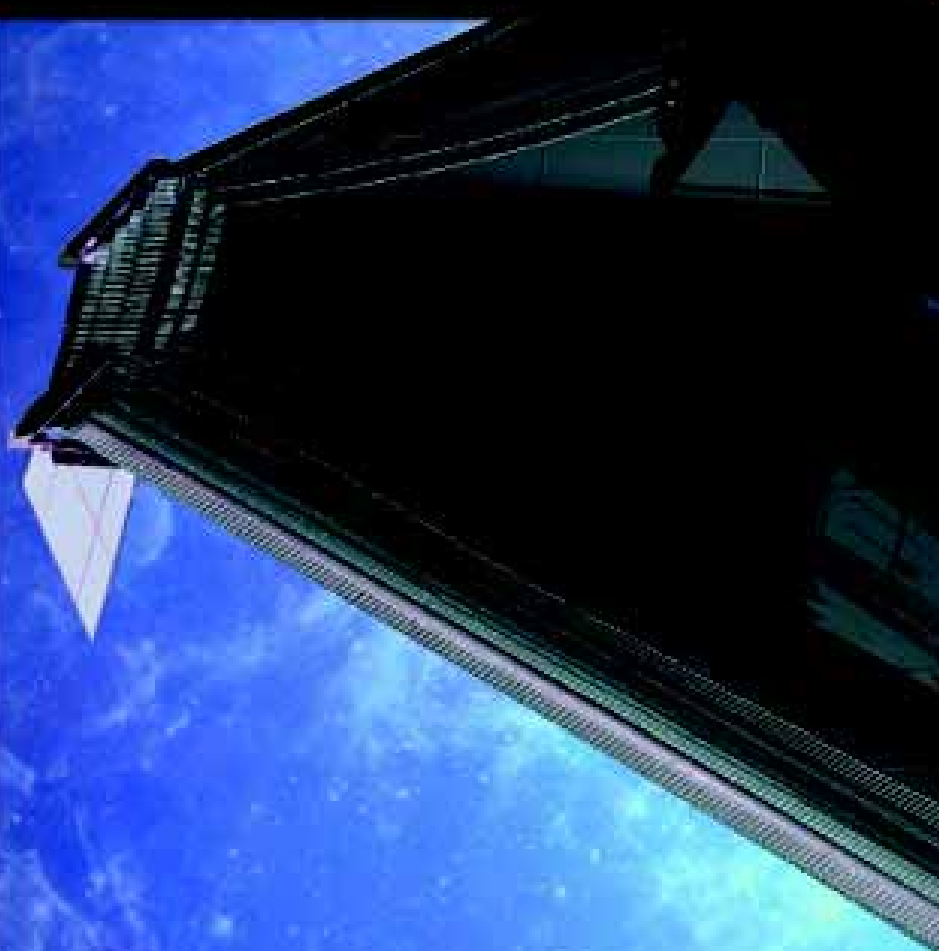


Jane Rigby
*Deputy Project Scientist
for Operations-JWST,
NASA*

Like a giant golden eye, NASA's James Webb Space Telescope will peer back to the beginning of time and watch galaxies collide. It will capture gorgeous images of stars and planets being

born. It will search for new planets and pursue the age-old question: Is life out there?

Astrophysicist Jane Rigby, who grew up in Sussex County, Delaware, is the deputy project scientist for this amazing new space tool. She will show us how it will revolutionize our view of the universe and fill us in on preparations for the telescope's launch in October 2018.



James Webb Space
Telescope Mural Image

Illustration courtesy of
Northrop Grumman

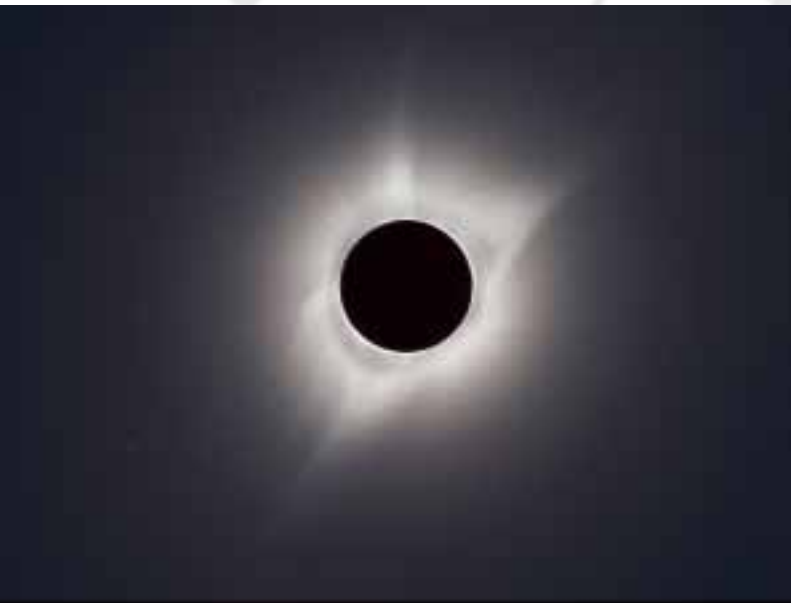


UNIVERSITY OF
DELAWARE.

**Free and
open to the public.
Please register online
at mountcuba.org**

Sponsored by the Delaware Asteroseismic
Research Center at the University of Delaware, Mount Cuba
Astronomical Observatory & Mount Cuba Astronomical Foundation

Eclipse Photos by DAS Member Don Shedrick
2017 Total Solar Eclipse from Jackson WY





Lost & Found at Woodside Creamery *Fred De Lucia*

Last night at the DAS Woodside Creamery outreach event amidst finely crafted ice cream, overcast skies, slim turnout and a very interesting and educational conversation with Woodside's owner about bovine care and ice cream, the owner brought to our (Jeff Lawrence, Jack G, Otto and I with my wife) attention a found red eyepiece cap. It looks like that it might belong to a classic ocular. I'll bring it to Tuesday Night's Workshop Session at MCAO if any one cares to claim it.

StarFest 2017 is on September 16 from 5:30PM to 11PM

The ChesMont Astronomical Society and Hopewell Furnace National Historic Site in Elverson, PA will host StarFest 2017 on Saturday September 16 from 5:30PM to 11:00PM and it's FREE!!! (Cloud/rain date is Sunday, September 17, 2017)

StarFest 2017 features astronomy presentations, activities for kids and public viewing of the wonders of the Milky Way through various types of telescopes under the dark skies of the Hopewell Big Woods, the largest contiguous forest in southeast Pennsylvania, spanning 73,000 acres.

Everyone, if they wish, is welcome to bring their telescope to set up on the field across from 10 Object Row where 10 telescopes will each be trained on a deep sky object for public viewing. DAS' own Pete Huesmann will be showcasing M15 with his 9.25" SCT on 10 Object Row. I'll be helping out at the tables.

Share your time with hundreds of fellow enthusiasts, the young and the not so young and experience the joys of astronomy.

StarFest 2017 Schedule:

5:30 p.m. Telescope set-up and solar observing.

6 – 7 p.m. Kids Corner educational activities.

7 p.m. Opening Remarks: CAS President, Josh Wright, talks about the evening's events and some history of CAS and StarFest.

7:15 p.m: Special Guest – Peter Detterline – shares his experience of The Great American Eclipse of 2017. Don't miss it!!

8:00 p.m. Keynote Speaker/Topic – Stephen Leete, Mission Systems Engineer from NASA's Goddard Space Flight Center, will talk about Gravitational Waves which are the ripples in the fabric of space-time caused by some of the most violent and energetic processes in the Universe.

9:15 PM. Drawing of the Grand Door Prize followed by public stargazing through amateur telescopes until 11PM.

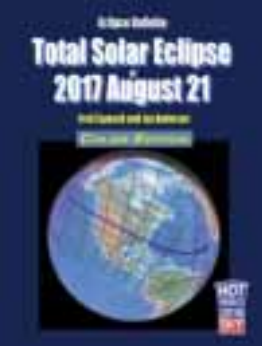
Door Prizes Sponsored by Celestron, Sky & Telescope and the members of ChesMont.

Grand Prize from Explore Scientific is a 102mm Doublet Refractor with a backpack, 8x50 binoculars, 2 EP's and a Alt/Az mount.

Free parking.

If there are any questions, please, email me off-line at fredworld@verizon.net.

Clear, dark and steady skies to all.



Eclipse Book for Library?

I have an extra copy of the Eclipse Bulletin by Fred Espenak and Jay Anderson, which I'm willing to donate. Would the MCAO library be interested in having it -- perhaps for historical interest?
Matt

**WELCOME New Members
to the DAS!**
**We're GLAD to have
You on Board!**

**Gregory Cain
Jia-Shyong Lin
Eric Czerwinski
Henry Sundermeyer,
Brice Haywood,
Slawomir Bucki.**

We now have 100 members!

Eclipse Photo by DAS Member Mark Mitchell



Here are two of my eclipse images. Both are high dynamic range images made from several merged photos of the corona in totality. The unusual looking one with the central black disc is made using a modification of a technique published by Gerald Pellett in the January Sky and Telescope of 1998.

Technical information

Target: Solar eclipse. About 250,000 miles and 9 light minutes away.

Date: 8-21-17

Location: Moss-Wright Park. Goodlettsville, TN

Telescope: None.

Mount: Astrotrac

Camera: Canon 7D Mark II. 200 mm Canon f2.8 L II lens

Temperature: 93° F

Filter: None during totality

Exposure: Series of shutter speeds at f8.0, ISO 200.

Software: Eclipse Maestro. EasyHDR. Photoshop CC 2017.

Observer: Mark L. Mitchell. markm2315@comcast.net

Eclipse update for some....

Fred De Lucia

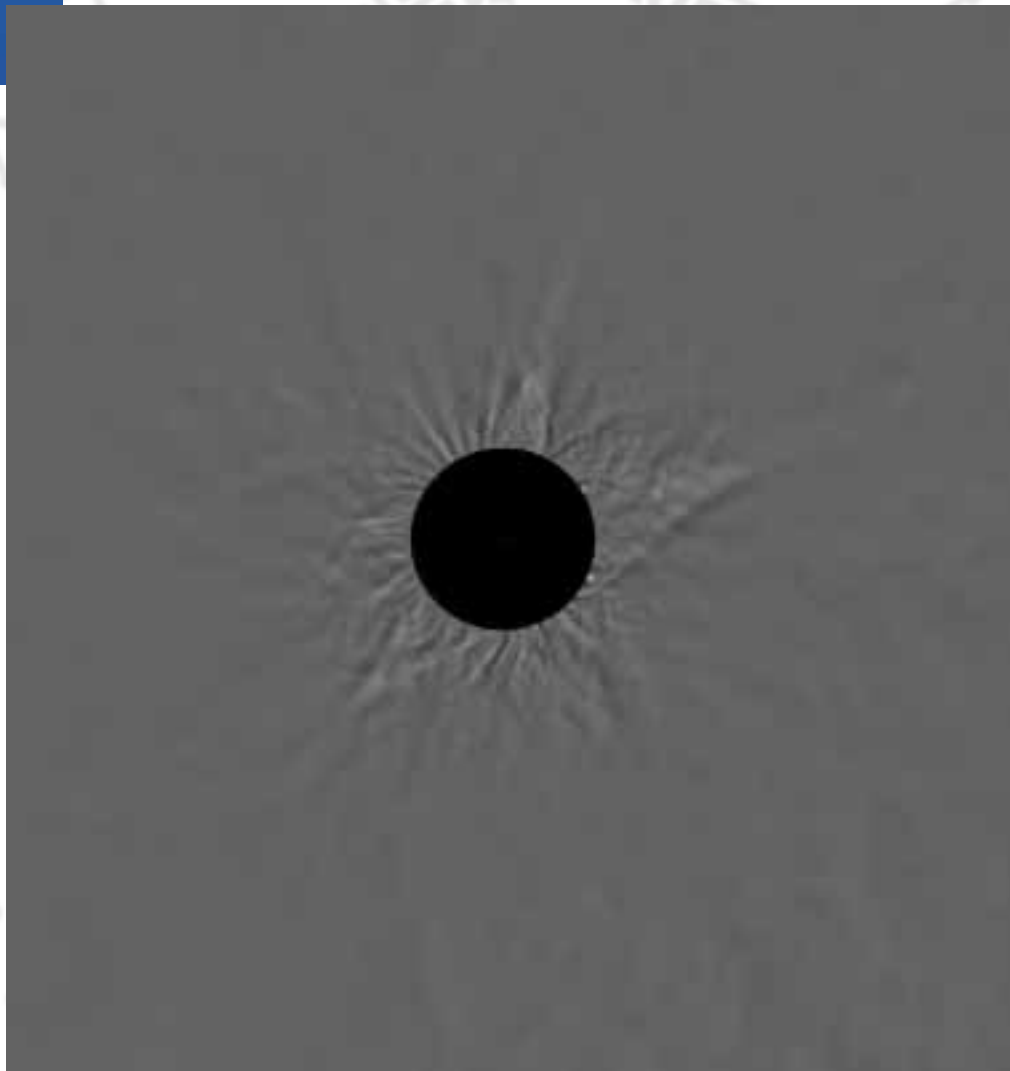
Josh, CAS' pres, texted me on his way to Hastings, NE saying, "So, they brought in a special forces portable air traffic control tower to Alliance Nebraska. They're going to be landing 130 Learjets there on Monday. Rich people coming in to watch the Eclipse. Kurt Russell is one of the people coming in. "

The 1%ers seem to have a plan. If it's going to be cloudy, they just take off and go where it's clear.

Eclipse at Brandywine

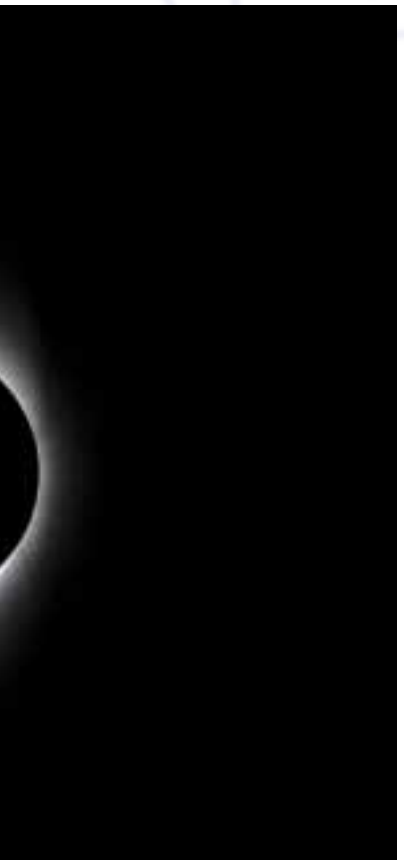
Creek State Park Lynn King

Just received final count from BCSP -- "1500" enjoyed the eclipse. Will have pictures at the Sept. meeting.



Eclipse Photos by DAS Member Willis Greiner
Observed in Alliance, NE



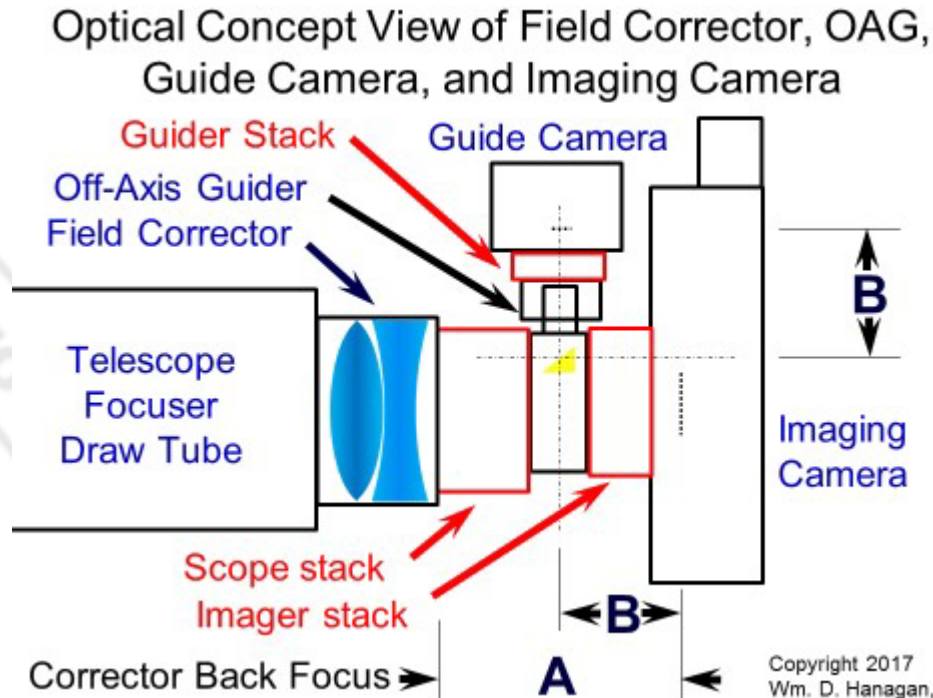


June 24 AP SIG Meeting at Mt. Cuba:

In addition to our usual review of member photos and Q&A, Nico Carver gave a PowerPoint presentation on the use of “Dithering and Drizzle Integration” for doubling a camera’s effective resolution on under-sampled deep-sky images.

I also gave a PowerPoint presentation on “Spacing Your Field Corrector, Off-Axis Guider, Imaging Camera, and Guide Camera” (for guiding during deep-sky imaging).

The overall situation when using an off-axis guider (OAG) is illustrated below.



Field Correctors (coma correctors, field flatteners, focal reducers, etc.) typically have back focus distances ranging from 55mm (very limiting) to 105mm (relatively accommodating). For use with an OAG, it’s usually necessary to find a corrector with a back focus of 70mm, but a larger back focus is definitely an advantage because it allows the use of a wider range of OAGs. Many of the older, larger OAGs also had larger pick off prisms whose wider angle of illumination supports a guide camera with a larger sensor.

Distance A in the diagram must typically match the stated back focus of the corrector to within 1 mm or less, otherwise the stars and other features away from the center of the image can be blurred. Some coma correctors are sensitive to position errors as small as 0.1 mm.

The Scope Stack, Imager Stack, and Guider Stack will often include one or more thread converters and one or more extension tubes to make the stack the required length. Choose the connectors and extension tubes carefully to produce the necessary thread conversions and to achieve the required spacing between components. To minimize vignetting of the camera sensors, it’s advantageous to keep the imager and guider stacks short and to formulate the scope stack to take up any remaining space. As shown in the diagram, the optical path distances from the reflective surface of the off-axis pick-off prism to the focal planes of the guide camera and imaging camera (B) must be equal so that both cameras can be in focus at the same time. Just about every OAG allows the guide camera to slide in and out 1-2 mm even after the pick-off prism is properly positioned. That’s not a lot of travel, but it’s more than enough if the Guider and Imager Stack lengths are well chosen. When calculating the length of the guider stack, position the pick-off prism first and assume that the guide camera will be near the top end of its adjustment range. Be careful here! Many OAGs will allow the guide camera sensor to run into the mounting stalk if the pick off prism is positioned far enough out! You may need to put a tape stop or other mechanical restriction on the guide camera mounting stalk to prevent this.

Fortunately, there are a number of thin off-axis guiders, thread adapters, and extension tubes that make it possible to set up an off-axis guider on many imaging scopes. By far the largest collection of these is sold by the German company [Teleskop-Service](#), but other vendors like Lumicon, Orion, and Celestron have off-axis guider kits that include many of the necessary connectors. Astro-camera makers including SBIG, Atik, Moravian, QSI, and QHY offer built in or add-on OAG’s that are unique to their specific cameras. Some of these are very nice and take up minimal additional space, but it’s still up to the individual imager to insure that their choice of corrector, astro-camera, and OAG will all work together.

Some correctors have a back-focus of exactly 55mm, which is just right for connection to the standard T-ring of a DSLR, since 55mm is the standard distance from the front of a T-ring to the focal plane of the matching DSLR. Unfortunately, a 55mm back-focus usually leaves no space at all in which to fit an off-axis guider (OAG). But there are two especially thin OAG’s made by Teleskop Service (TSOAG9EOS) and Orion (TOAG) that have special bayonet mounting rings for Canon EOS cameras which allow the guiders to fit into the same space taken up by the standard EOS T-ring. *(Continued on Following Page)*

OAG's offer valuable advantages over the use of separate guide scopes, including immunity to many sources of flexure and much greater guiding sensitivity. While formulating a good OAG system can sometimes be a challenge, you generally only need to do it once for any combination of camera and telescope.

July 22 AP-SIG Meeting at Mt. Cuba

During the July 22 meeting at Mt. Cuba, in addition to our usual review of member photos and Q&A, I reviewed "Collimation Techniques and Tools," including how to collimate Newtonians, SCTs, and refractors using sight tubes, Cheshires, lasers, and Barlowed lasers.

Nico Carver discussed the "use of the club's Brandon 94mm triplet APO refractor," which he used to produce the spectacular narrow-band image of the Crescent Nebula (NGC6888) which appears below.



The Crescent Nebula is often imaged using only a Hydrogen alpha narrow band filter. Nico also acquired OIII data for his image, producing a striking difference in the appearance of the Crescent. Near the bottom of the image and a little to the right, appearing as a faint purple bubble, is the very faint [Soap Bubble Planetary Nebula \(PN G75.5+1.7\)](#) discovered by amateur astronomer Dave Jurasevich using an AP refractor and SBIG CCD camera equipped with a Hydrogen-alpha narrowband filter. You may need to enlarge the image quite a bit in order to see this.

Nico used his own focal reducer / field flattener, mount, guide camera, computer, ASI1600mm astro-imaging camera, narrow band filters, and other equipment to obtain the data. His imaging rig is seen in the next photo with the baby blue Brandon 94mm on the right. The Brandon performed well in combination with Nico's focal reducer / field flattener and produced stars in the corners of the field as round and sharp as those at the center.



August 11 AP-SIG Meeting at Mt. Cuba

During the August AP-SIG meeting, in addition to our usual review of photos and Q&A session, "we discussed how to automate the acquisition of images during the upcoming total solar eclipse." I reviewed the PC based programs "SETnC" and Eclipse Orchestrator and Nico Carver demonstrated the use of Eclipse Maestro for MAC users.

Refreshments for the summer meetings were provided by Rick Davis, Bob Trebilcock and myself.

Imaging and Observing During the August 21 Total Solar Eclipse

Bill Hanagan

Although we'll see a brief review of several members' eclipse activities at the September DAS meeting, I thought I would include some photos from my own eclipse trip in the FOCUS for those who may not be able to make it to the meeting and to chronicle the eclipse activity in a more permanent form for future eclipse chasers.

My overall plan for the eclipse was to enjoy it along with family and friends at a site near Carbondale Illinois a couple of hours south of where I grew up. The cloud cover was a serious concern up until 2 minutes before totality, at which point a very large cloud that seemed to have us skunked shifted to the north and disappeared. Eclipse watchers at the 15,000 seat Salukis stadium 3 miles away were clouded out during totality, but from the video I've seen they seemed to enjoy the eclipse anyway.

My imaging and observing plan was to arrange for my telescope and camera to take pictures under computer control with a minimum of assistance from me while I observed the eclipse naked eye and with binoculars.

A thorough discussion of the preparations for eclipse imaging would not likely be of interest until the next eclipse, but it's important to note that I did a full practice run 3 days ahead, setting up and using all of the equipment just as I planned to do during the eclipse. I also did full length tests of the power requirements of the computers I had available to determine with certainty which computers I could rely on to go the distance. All of the practice and preparation revealed several potential snags, allowing me to streamline the process before show time. Without this preparation, I might have had to interactively solve problems during the eclipse, which would have been a chaotic distraction from what is otherwise one of nature's most amazing and short-lived performances.

The SETnC eclipse exposure control software that I used with my PC worked very well once I got enough experience with it to learn how it worked. The most serious problem I encountered (other than the potential cloud out) was that I was so awed by the spectacle of totality that I didn't get around to removing the filter from the scope until several seconds after second contact! I would have taken even longer if Mary Ann hadn't shouted "Filters OFF!" Visiting with some other imagers later in the day, I discovered that a couple of people forgot to remove their filters entirely!

Binoculars were a fantastic choice for observing the eclipse, but in retrospect, I wish I'd managed to squeeze a 6" Dob into my vehicle to go along with the binoculars.

The first photo (below) shows our intrepid group of eclipse chasers at the SIU Dark Site south of Carbondale, IL. From left to right are my brother Michael J. Hanagan who drove with me out to Illinois, my wife Mary Ann Hanagan (who flew in from D.C. that morning after receiving an ACS "Heroes of Chemistry" Award the night before), Michael's Wife Randi Brown (a retired school teacher), fellow AP-SIG member Rick Spencer (who drove in from Kansas City because the weather there was poor), and yours truly, Bill Hanagan.



The next photo shows a tight framing of the sun about 18 minutes after first contact, but with the major sunspot groups still visible. I used the Baader ND 5.0 Astrosolar safety film both before and after totality. Combined with the UV absorbing glass of my telescope, camera, and binoculars, I had no concerns about the filter material being safe. For direct visual observing, we all used the printed paper glasses made by Rainbow Symphony.



To the far right, numerous images of the partially eclipsed sun can be seen projected on the pavement, courtesy of my friend Craig Hillemann, who observed the eclipse from a park in Perryville Missouri a few miles to the west. Craig reported that while Perryville hotel rooms were booked up months ahead of the eclipse, the town itself and the observing sites like the park were not crowded.

Below is a photo of my imaging rig and the encampment. As is often the case in southern Illinois during August, the weather was hot and extremely humid. Thanks to Bill McKibben, we had a canopy for shade, which we placed to the north just beyond the arc of the telescope.

At our site, shadow bands had low contrast but were easily spotted once you realized they moved continuously at about 1 foot per second.



The next two photos were taken about 1 second or less apart and show a commercial airliner flying into and out of the eclipse shadow.



(Continued on Following Page)

The next photo is my single best exposure of the prominences on the western side of the sun just before the end of totality, the point at which those prominences were almost completely exposed to view as the moon slid eastward past the sun. These prominences were all dramatically brighter than any of the white streams of the solar corona that are seen in much longer exposures. Eventually, I plan to combine both long and short exposures into a "High Dynamic Range" or HDR image that keeps these prominences looking as bright and glorious as possible while just bringing the faint coronal streamers up enough to be visible, as should be done given that these prominences are by far the brighter features.



In closing, I would say that I'm very glad that I took the time to photograph the 2017 total solar eclipse even though it was my first eclipse, but I can say this in part because I did the prep work necessary to make the camera equipment run automatically while I enjoyed the eclipse.

The most important point I can make about the whole eclipse experience is that there is something very awe-inspiring and majestic about a total solar eclipse and no one I know has been disappointed that they went to the trouble to see this one.

*Photo by DAS
Member S. Bucki
From Garfield Park
Library in
New Castle, DE*



8" Celestron For Sale by Bill Westerguard-- Contact Bill directly at 302-827-8099



FOR SALE: 8" CELESTRON TELESCOPE WITH CARRYING CASE, WEDGE, & TRIPOD. THE TELESCOPE WAS MODIFIED FOR EASY POLAR ALIGNMENT AND ADJUSTMENTS FOR LEVELING.

ALSO INCLUDED ARE THE FOLLOWING ITEMS:

EYE PIECES, ALL 1 1/4" EXCEPT AS NOTED : 2" PLOSSL 55 mm, ORTHO 25,18, 12.5, & 6 mm. TELE VUE PLOSSL 26, 17, 10, & 7.4 mm. MEAD SUPER 20mm MULTI COATED PLOSSL. MEADE 2X-3X VARIABLE TELENEGATIVE MULTI COATED. UNIVERSITY KONIG 32 mm MULTI COATED. CELESTRON KELLNER 40 & 25 mm. TELE VUE 12 mm NAGLER TYPE 2. MEADE SUPER PLOSSL 32 & 6.4 mm MULTI COATED. MEADE 2X TELENEGATIVE AMPLIFIER AIR SPACED TRIPLET MULTI COATED MODEL 140. CELESTRON STAR DIAGONAL, CELESTRON 90 DEG. ADAPTER. ROUND CRAFTSMAN

LEVEL. 2" ADAPTER FILTER. SET OF FIVE THREAD-IN FILTERS.

ALL OF THE ABOVE 18 EYE PIECES AND EQUIPMENT COME IN TWO CARRYING CASES. IF INTERESTED, ALL ITEMS AND TELESCOPE LISTED ABOVE ARE CONSIDERED ONE ITEM AND WILL NOT BE SOLD SEPARATELY.

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Photo by DAS Member Tom Lapp
Center City Philly outreach



Sometimes, Patience Favors the Foolish Fred De Lucia

I had an excellent session at the Blue Mountain Vista Observing Field (BMVO) on June 25, except for the one-hour cloud out around midnight that interrupted what began as a great session. Several members of Chesmont (CAS) and the Delaware Valley Amateur Astronomers (DVAA) were there, also. Waiting out the overcast sky was the right call, especially after a 2 hour drive. I had my 18" StarStructure truss tube Dobsonain and my Oberwerk BT45-70 binocs that I bought at NEAF in April.

It was one of those BMVO nights of almost non-existent dew, even at 4AM when Lionel of CAS and I were last men leaving. The Milky Way was as stunning as it can get without going out on a longer drive. The Great Rift was, of course, dark, cleanly expanded through the Summer Triangle and contrasted very well against the brilliant star fields of the Milky Way. Other observers commented that the Milky Way was the most intense seen this year.

The transparency supported very good views of many deep sky objects. I had one of the best BMVO views ever of M57 (Ring Nebula) and spiral galaxy M101. The slender edge-on galaxy NGC 4565 had a prominent, thin dust lane. Both the East and West portions of the supernova remnant Veil Nebula through a Lumicon OIII filter in a wide field eyepiece looked delicate, yet, brightly displayed detailed filamentary structure. The dimmer but just as beautiful Crescent nebula, NGC 6888, was an exciting bonus. Even the bridge connecting The Whirlpool Galaxy, M51, to its smaller companion was visible. I used my Oberwerk BT45-70 binocs for some alternate views of Sagittarius' dense star fields around the Lagoon Nebula (M8).

Companions on the field shared their views with me through a 16" Teeter dob and a 22" Obsession UC of a few planetary nebula such as M57 (always nice to compare views through different scopes) where the central star was "in and out" at 561x. The Little Gem, NGC 6818 in Sagittarius was very bright with a faint outer shell at 561x. Back at my scope I pecked down on my Skytools3 Pro observing list until it was time to pack it in at 4AM. After one last long scrutinizing look at that sprawling Milky Way I drove off the field for home.

Poor sky conditions kept me from getting out again until August 26 when Jack Goodwin and I shared the BMVO field with Josh and Robert W of CAS and Igor of the Bucksmont Astronomy Association (BMAA). Upon arrival at 7:30PM the clear forecasts were proved wrong as a total cloud cover threatened to destroy the session but we waited it out with great results by 11:15PM. Patience favors the foolish... sometimes, and this was one of them. Jack and I were last to leave the field at about 5:30AM. But that night wasn't as transparent, nor as dry, as it was on June 25.

Clear, dark and steady steady skies to all.

Comments? Feel free to send your thoughts to delawareastronomicalsociety@yahoo.com, I'll be sure to see them for a reply.



Report on Summer Events...

Weather this past Summer has had its toll on some of our events. On July 14, Friday Night Lights, the annual music and stargazing event hosted by the Natural Lands Trust (NLT) at the ChesLen Preserve in Chester County, PA, was not only a complete cloud-out but innovative astronomers had to hustle a makeshift shelter for a sudden rain shower. Huddling the nearest SUVs and rigging plastic tarps with bungee cords had members of several astronomy clubs sharing the sometimes leaky refuge. The NLT plans to organize another one next year, hopefully with better weather.

At the September 1 Woodside Creamery Telescope Night there was a light turnout under overcast skies but Jack, Otto, Jeff, my wife Pat, new member Jia-Shyong Lin and his spouse and me spent the evening amidst finely crafted ice cream, overcast skies, slim turnout and a very interesting educational conversation with Woodside's owner about bovine care and ice cream. Let's hope that the next Woodside Telescope Night on September 29 has better skies.



**DAS Now has a Discount Subscription Rate for
Amateur Astronomy Magazine**

Amateur Astronomy Magazine: DAS members must print, fill out and mail the form found in the "Files" section of our Yahoo email list website.
The magazine is issued quarterly. <http://www.amateurastronomy.com/index.htm>.

September 23 AP-SIG Meeting to be Held On-Site at Rick Spencer's *Bill Hanagan*

The start time for the September AP-SIG meeting depends on the weather and will be announced to AP-SIG members along with driving directions two days in advance of the meeting.

Indoors, we'll review members' photos and talk about eclipse image processing, which for a lot of people is an ongoing effort. We'll also have our usual Q&A on astro-imaging techniques. If the weather is good, we'll defer some of this discussion to the October meeting to save time for the outdoor content.

Outdoors. If the weather looks good enough for imaging, Rick will demonstrate his new Astro-Physics 1100GTO German equatorial mount, including the Right Angle Polar Alignment Scope (RAPAS). Since I also have an AP-1100GTO I'll be helping Rick with this demonstration. If the forecast is for clear skies, AP-SIG members with mobile imaging rigs will be invited to bring them out to do some imaging. The sky over Rick's home west of Fair Hill is significantly darker than that over New Castle County.

Anyone interested in astrophotography, from curious beginner to expert, is welcome to attend! But, if you're a visual observer, please note that while you're always welcome to come out to AP-SIG meetings to learn about imaging, the lighting conditions at our meetings are sometimes less than ideal for simultaneous visual observing because of the computers and cameras in use.

The AP-SIG is very good at helping beginners improve their images, so don't be shy about bringing imperfect images along to get some advice on how to take even better images. If you are not an AP-SIG member you can always come to the meeting to see what goes on and sign up later.

We always have a Q&A period in which we present and discuss all types of imaging gear including telescopes, auto guiders, CCD cameras, DSLRs, camera lenses, etc. We also take a look at everyone's most recent photos. When you come, be sure to bring a USB memory stick with your astrophotos and any related project materials that you would like to show the group. Even if some of your photos have imperfections, it's a good idea to bring them along to promote the discussion of image acquisition and processing techniques.



DAS AMATEUR TELESCOPE MAKING SPECIAL INTEREST GROUP *Bill Hanagan*

The DAS Amateur Telescope Making (ATM) Special Interest Group (SIG) is made up of DAS members who get together to work on their own as well as club related telescope making projects. The ATM SIG meets at times and locations appropriate for whatever projects are currently underway.

The general range of activities of the ATM SIG includes all manner of telescope making including Newtonian mirror making, the testing of complete telescopes as well as individual optics, and the making of telescope accessories. In the past, we've made several Newtonian telescope mirrors from scratch and completed some that members brought in as works in progress, including one that was started in the mid-60's! We've also made new telescope tubes, made secondary mirror holders, tested numerous telescope objectives, manufactured spiders, and made many solar filters for telescopes and binoculars. We recently completed the refiguring of the DAS 17.5" Newtonian mirror.

Anyone interested in joining the ATM SIG should email their name, address, and phone number to me at hanaganw@verizon.net.



FOCUS uses plenty of photos
in banners & elsewhere each issue, and
we want to use YOURS...not Hubble's!!

Photos need NOT be current.

**So how about you?? HAVE ANY
OLD or NEW ASTROPHOTOS??**

PLEASE email to FOCUS editor

(or tell us where they can be found on the web if your photos reside there!)

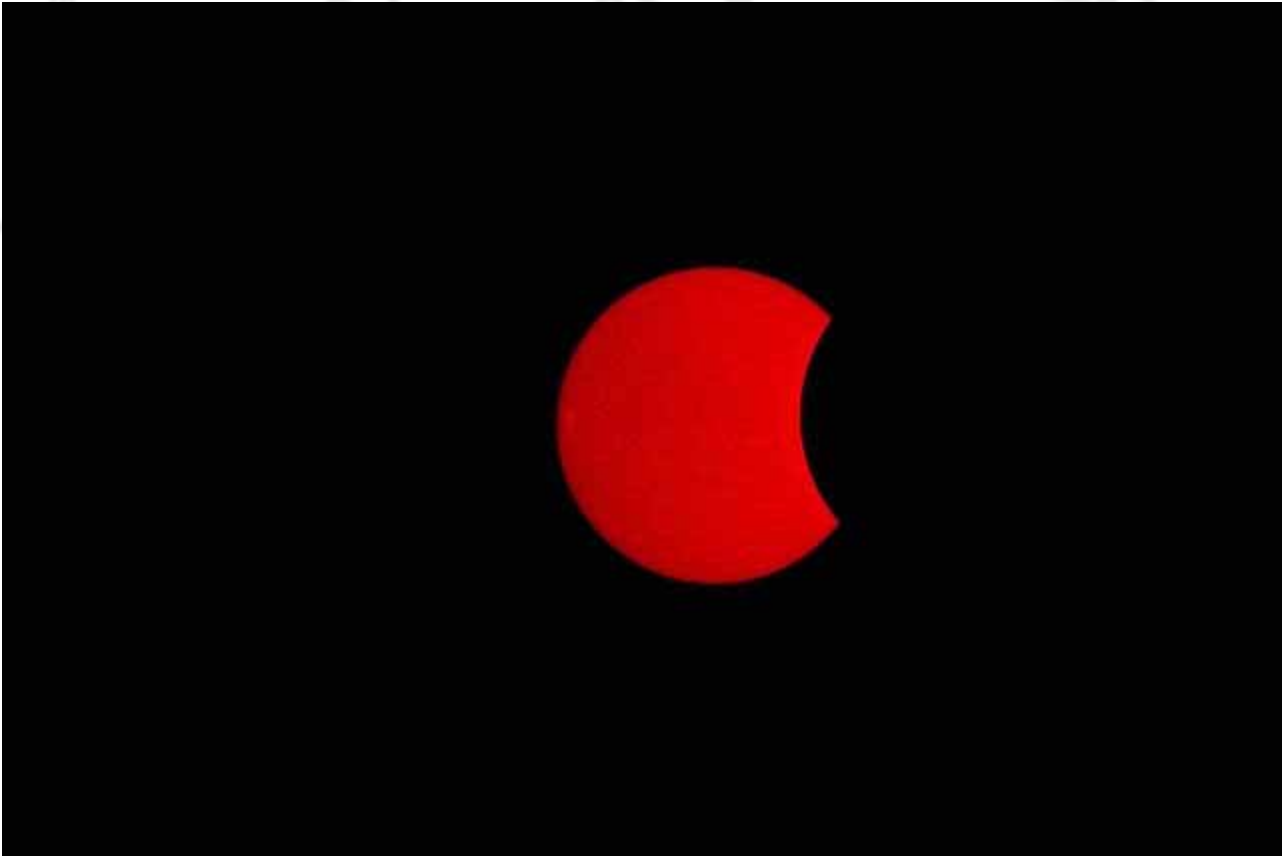
Astronomical League

For those who like the challenges of observing and learning more about the night sky, there is an observing program for you. Dues to AL are only \$7.50. If you have any questions, please contact me at klynking@verizon.net.
Lynn King

Eclipse photo collage *Jane Snyder*

Photos taken in my driveway in Chadds Ford. Had so much fun.
Photos were taken with a Canon Mark II 5 D attached to a Coronado Solarmax 60 II. Would have loved to have seen totality!
I will miss the next meeting as we are leaving for Cherry Springs Black Forest Star Party on the 17th.

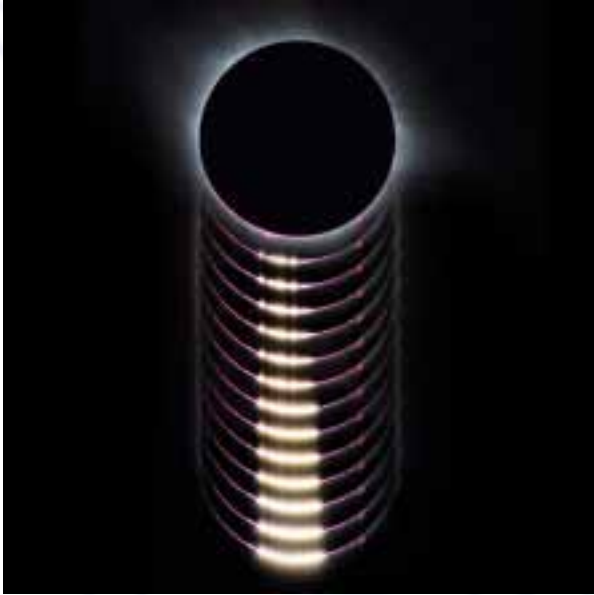




Photos by DAS Member Nico Carver

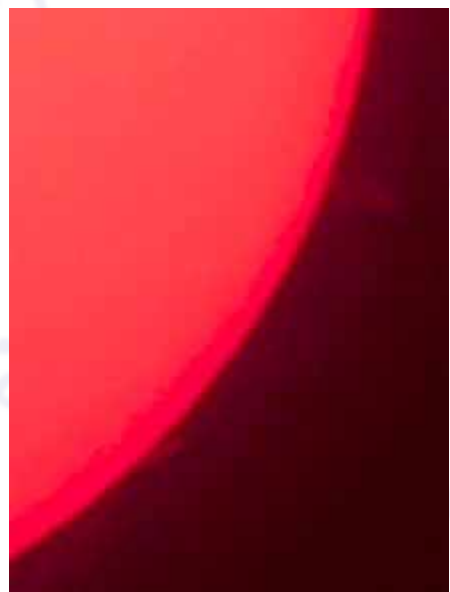
I have 3 eclipse photos to share from Nashville, TN. I had clouds that cleared shortly after second contact. Photos are: 2nd contact- Diamond Ring with clouds, Max Eclipse HDR of 6 shots ranging from 1/100s to 2s showing a little earthshine and the inner/middle/outer corona, and a composite of 12 shots at 2nd contact showing the progression from corona to bailey's beads to diamond ring events (top to bottom).

I also have 2 astrophotos to share from this summer both taken with my ZWO ASI1600MM-Cool CMOS mono camera attached to my Canon 200mm lens with narrowband filters (photo attached). The first photo taken with this setup in May/June is of the North America and Pelican Nebulae in Cygnus. It is comprised of 6 hours integration through Ha, OIII, and SII filters (2 hours each filter). The second photo was taken from dark camping sites (Spruce Knob Lake, WV; Daniel Boone Natl. Forest, KY; Cherry Springs, PA) along my road trip to see the eclipse in August. It is of the Flying Bat and Squid Nebulae in Cepheus. It is the most challenging photo I've ever taken. Despite being huge in angular diameter, the Squid was only discovered in 2011 by a French amateur astrophotographer due to how incredibly faint it is. My photo of these objects is comprised of 10 hours integration (3 hours Ha (red), and 7 hours OIII (green/blue)).



Picnic ... and the sun *Rob Lancaster*

Thanks to everybody who came out!! It was an excellent picnic! And the sun was fantastic in the solar scope. I tried to get some photos with my cellphone through the club's new Lunt, see what you think:



Photos by DAS Member Rob Lancaster

We saw the Great American Total Solar Eclipse of August 2017 from Trail of Tears State Park in Southeast Missouri. These are my photos from the event.



Sawin Certification Program

The Sawin is the major centerpiece of DAS. In the past it was in use much more often and by a number of members on every clear Friday night. It has been largely underutilized for a number of reasons. One reason, I believe, is that newer members or members who do not own a telescope might feel intimidated by the equipment and the observatory's layout. We hope to address this by instituting the Sawin Certification Program. With the new upgrades installed, its use will be more inviting and user friendly to both new and experienced members. Certified Key Holders of the Sawin have access to its use at any time without supervision



The Program will consist of a minimum of 2 sessions, scheduled at the Sawin, to obtain the necessary knowledge and experience in using the Sawin equipment. These sessions will be supervised by a current Sawin Key Holder.

The first session, likely set for a weekend in the daylight (even if it's cloudy), will familiarize learners with the layout of the Sawin and overall operation, including opening the roof, uncovering and covering the telescopes, handling eyepieces and pointing the telescopes, etc.

If the supervising Sawin Key Holder determines that progression during the first session is acceptable, then the second session will be scheduled for a clear sky night session to address night time use of the equipment.

The Sawin Certification Program is for DAS members only who are in good standing and 16 years of age or older. Participants in the program who are under 18 years of age must be accompanied by a parent or guardian.

For information or sign-up, please contact Rob Lancaster, DAS President at RLancaste@gmail.com.

ASTRONOMICAL LEAGUE MEMBERSHIP

- The DAS offers an optional membership in the Astronomical League (AL) at a discounted rate.
- AL membership dues are \$7.50 per year and are due on June 1 for all members.
- Prorated discounts for new memberships starting mid-year are as follows:

April 16 - July 15: \$7.50 per member

July 16 - Oct 15: \$5.62 per member

Oct 16 - Jan 15: \$3.75 per member

Jan 16 - April 15: \$1.87 per member

For questions regarding Astronomical League, its observing programs and to sign off on completed observing programs before being submitted to the Astronomical League, contact Lynn King at klynking@verizon.net.

Members should make their check out to DAS and mail it to the Treasurer whose information is below:

Diana Metzger, Treasurer, 604 Baldwin Lane, Wilmington, DE 19803

Call for DAS AstroImages for Display in Mt. Cuba Lobby

MCAO is asking for any DAS members to submit their astroimages for display in the Observatory. It would like to display the club member's talents and update some of the images currently on display in the lobby of the Observatory.

Images will be displayed for up to a year and replaced as new images are submitted. Full credits to the imager will be included. Please include all technical information with the image (date, telescope and camera used, exposure time, image processing software, etc.). You may email digital images to the Mt. Cuba website. Photos may be sent to the Observatory or brought to a DAS meeting.

The Observatory looks forward to displaying your beautiful images! Contact Greg at mtcuba@physics.udel.edu.



INFORMATION ON DAS MEMBERSHIPS AND MAGAZINE SUBSCRIPTIONS

DAS MEMBERSHIP

- DAS membership dues are \$30.00 per year and due on November 1 for all members.
- There is no need to renew membership until the treasurer contacts you during the membership renewal drive starting in mid-October.
- New members joining at various times of the year may be eligible for a prorated dues amount.
 - \$20 when joining March-May
 - \$10 when joining June-August
 - \$30 for joining September-October through November 1 of the following year.

SKY & TELESCOPE MAGAZINE

- The DAS offers subscriptions to *Sky & Telescope* at a discounted rate of \$32.95 per year.
- Call S&T magazine at 800-253-0245 and mention the club's name to receive the discount

ASTRONOMY MAGAZINE

- The DAS offers subscriptions to Astronomy magazine at a discounted rate of \$34.00 per year.
- Subscriptions to Astronomy will be processed by the club for the first subscription year only.
- Your subscription expiration date should be displayed on the mailing label on your magazine.
- Renewals can be handled by all club members on the Astronomy.com website using the following steps:
 - a. go to www.astronomy.com
 - b. select the 'customer service' link in the upper right corner
 - c. select the 'renew your subscriptions' link
 - d. enter your customer number (found on the mailing label), postal code, and the renewal code of 'RCLUB040' and click 'continue'
 - e. follow the remaining steps from there.

NEW MEMBERSHIP FORM

- Please review the membership and magazine information above carefully.
- PLEASE fill out the membership form below completely.

NEW MEMBERSHIP FORM

Please be sure to review the **Membership** and **Magazine** information above **carefully**.

Please make checks payable to DAS and forward to:

Diana Metzger, Treasurer, 604 Baldwin Lane, Wilmington, DE 19803



Membership	\$30.00/20.00/10.00	<input type="text"/>
Astronomy Magazine	\$34.00	<input type="text"/>
Total:		<input type="text"/>

Name _____ Email Address _____

Street Address _____ Phone Number _____

City _____ State _____ Zip _____

Notes _____

For questions or concerns, contact Diana Metzger, DAS Treasurer at (302) 290-2108 dmetzgermd@gmail.com

DAS CONTACTS Please Call Any of Us With Your Concerns or Problems

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Vice-President: Jeff Lawrence -- Jeff@DelAstro.org -- (302) 668-8277 -- also, Program Chair

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Amateur Telescope Making Special Interest Group (ATM SIG)

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Standing Chairs:

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Observatory: Jack Goodwin -- (610) 457-2945 -- Jack_Goodwin@yahoo.com

Education: Ted Trevarrow -- (302) 593-7949 -- edt750@verizon.net

Library: Maria Lavalley and Sue Bebon Astronomical League Coordinator--K Lynn King -- klynking@verizon.net

Observing Chair: Greg Lee Nominations Chair: Amy Hornberger -- aehornberger@gmail.com

Elections Chair: Nico Carver -- (302)353-2448 -- nicocarver@gmail.com



See Preceding Page for New Membership Form

If you have any questions call any of the member representatives listed. Otherwise, just check the appropriate boxes and complete the form on the preceding page. Print it or cut it off and send it with your check to Diana Metzger at her address on the form. The magazine prices are group rates to DAS members.

If you're just joining us for the first time, THANK YOU VERY MUCH, and WELCOME to the DAS! It's GREAT to have you with us!

It's ALL about the Solar Eclipse of 2017

The Last
Word. . .



**FOCUS Editor
Joe Neuberger**

In this issue of the *FOCUS*. There's OUTSTANDING Photos of the Phenomena by member after member, many who traveled across the country to be in the right Spot! Enjoy them & don't miss Tuesday's meeting to hear their stories!

They are little more than FANTASTIC!!