FOCUS
Vol. 62, No. 7, OCTOBER, 2017

DELAWARE ASTRONOMICAL SOCIETY

Monthly Meeting – Tuesday, October 17th, 2017 at 8:00pm

Topic: "Occultation Timing for Amateurs"

Speakers: – Steve Conard, a member of the International Occultation Timing Association

At the Mt. Cuba Astronomical Observatory

FROM THE PRESIDENT--Rob Lancaster

DAS Members,

I hope you were able to attend our September meeting where members shared all of their experiences, photographs, and excitement from the eclipse. Thank you to everyone who came out and shared your stories! I think it was an excellent meeting. And a big thank you goes out to Jeff for organizing all of the talks together into a nice coherent program. We appreciate your programming efforts as always.

As we enter the fall observing season, we can delight at the wonders of the milky way in the early evening in the relative comfort of cooler weather. This stands in stark contrast to the typical hot and muggy nights of the summer, or in the case of this year, the near constant rain and clouds we had this summer. But the last couple of weeks have had fantastic weather for observing, so I hope you got a chance to observe the grandeur of the summer milky way before it recedes into the evening twilight. If not, there is still time!

I hope to see you at the October meeting, where we will have an excellent presentation about Occultation Timing from Steven Conrad from Johns Hopkins. But also remember that we have a lot more going on than just the monthly meetings. We have quite a few member star parties and outreach events. 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 of 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 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!

IN THE OCTOBER ISSUE. . .

Click Below To

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.

Cyngnus Loop-Veil Nebula -- Photo taken by Nico Carver in December, 2016

10/17/17 DAS Board Meeting Agenda

1. **Review of Minutes from Last Meeting—Bill McKibben**
2. **Treasurer's Report–Diana Metzger**
3. **Dinner Meeting Planning—Jeff and Diana**
4. **Lock for the Sawin—Jeff Lawrence**
5. **Storage Room Cleanup—Rob Lancaster**
6. **DAS Outreach—Ted Trevorrow**
7. **DAS Member Events—Greg Lee**
8. **Update on Club Equipment—Jack Goodwin**
9. **DAS Projects and Workdays Update—various members**

"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:

October 25, 2017 6:30 pm - 8:00 pm
Location:
Bellevue State Park, 800 Carr Rd, Wilmington, DE 19809, USA

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 Colimator. 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*.

Vernon Lecture Series Presents the James Webb Space Telescope

The Harcourt "Ace" Vernon lecture at the University of Delaware's Clayton Hall on October 3 featured an excellent overview of space telescopes by Dr. Jane Rigby with emphasis on the James Webb Space Telescope, its purpose and its tasks. Judy Provencal, Associate Professor of Instruction, Director of the Delaware Asteroseismic Center and Mount Cuba Astronomical Observatory's resident astronomer introduced Dr. Rigby.

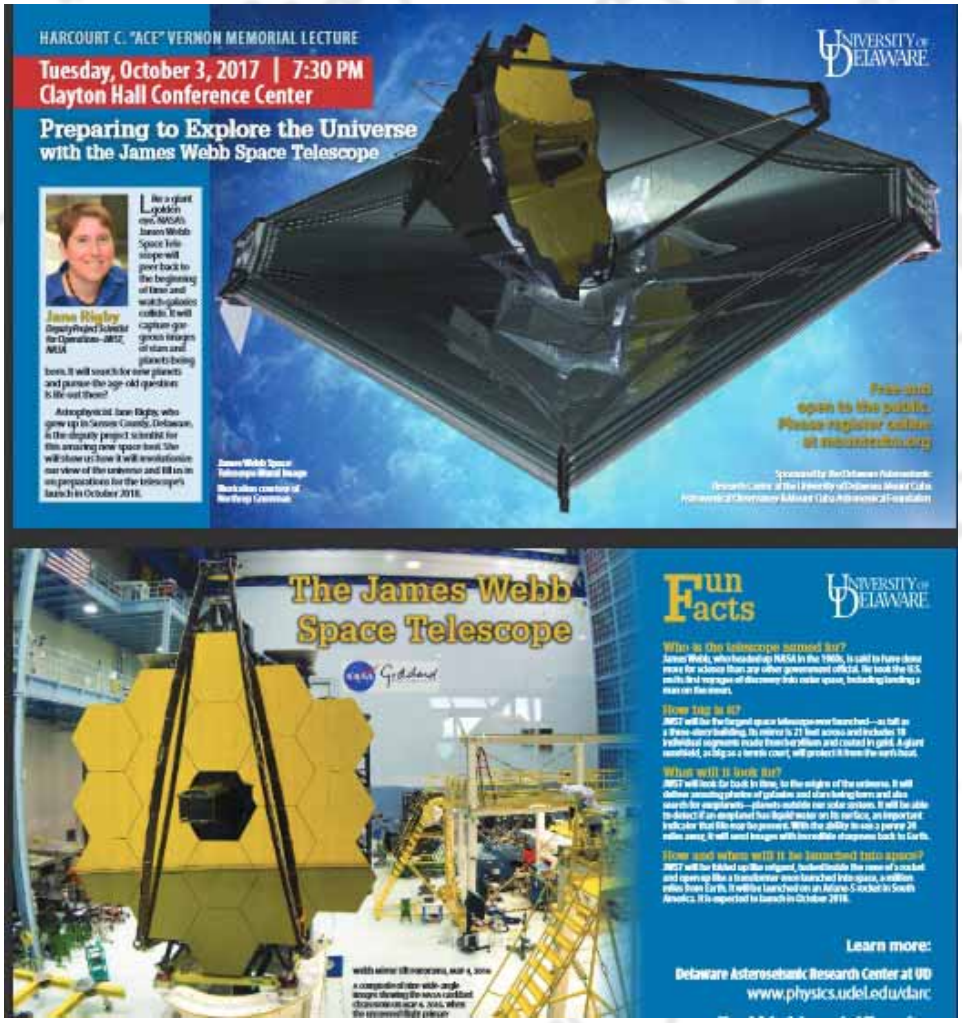
Doctor Rigby, who readily admits to being "a native to lower/slower Delaware," is an astrophysicist at the NASA Goddard Space Flight Center. She quickly took the topic to lofty heights, kicking off with distance comparisons of our Solar System's planets, the Milky Way's deep sky objects, the Andromeda Galaxy and the thousands of galaxies captured in the images of the Hubble Deep Field. From there it was one fascinating fact or a profound unanswered question after another as she laid out the drivers behind the purposes of the Hubble, the Spitzer and the Chandra Space Telescope missions. She sprinkled the technical jargon with an air of light-heartedness that agreeably complemented her explanation of the dynamics of the James Webb Space Telescope. She outlined the engineering challenges to overcome after the James Webb is positioned one million miles from Earth, where no repair mission can be planned, before it can realize its intended scientific discoveries. A lively Q&A followed the near one hour lecture with questions intelligently provided by inquisitive listeners.

THIS MONTH'S MEETING SPEAKER...will describe opportunities for amateur astronomers to contribute scientifically by timing occultations. Occultations of stars by the moon are a very regular occurrence, and about 1 in 100 video-timed occultations result in a previously unknown double star's discovery. Asteroid occultations, while somewhat rarer, can result in generating a silhouette of the asteroid--giving important size and shape information that is not otherwise easily obtained. These asteroid observations have also produced occasional discoveries of asteroid satellites, rings, and double stars.

Bio: Steve Conard is an optical systems engineer for the Johns Hopkins University Applied Physics Laboratory in Laurel, Maryland. He has developed hardware for space missions for 35 years. His enjoyment for telescope making as a teenager led him to a career in optics.

Further, here is the program layout for the entire season as of now:

September 19 2017
IKWYDLS: Eclipse stories
October 17 2017
Steve Conard – "Occultation Timing for Amateurs"
November 21 2017
John Conrad – "The Cassini-Huygens Mission of Saturn and Titan"
December 19 2017
Holiday celebration
January 16 2018
Jim O'Leary – "Astronomy at the Top of the World"
February 20 2018
Paul Halpern – "Feynman"
March 20 2018
Preston Smith – "Traveling With Your Scope"
April 17 2018
Member mini-talks
May 15 2018 - Dinner Meeting - TBD
June 19 2018 - TBD



Report on the September AP-SIG Meeting by Bill Hanagan

The Astro-Photography Special Interest Group (AP-SIG) met on September 23 at Rick Spencer's home about 5 miles northwest of the Fairhill Natural Resources Area. Rick provided an excellent dinner of Indian takeout food and I provided the beverages. Thanks for hosting Rick, and for the great Indian food!

After dinner, we reviewed some new deep sky images by Nico Carver and Dana Wright on Rick's flat panel TV, as well as Total Solar Eclipse photos by several members including Nico Carver, Rob Lancaster, Ron Worden, and myself, most of which appeared in last month's issue of the FOCUS.

The solar corona is a particularly challenging object to represent in a photo since the brightness of the coronal features changes very rapidly with distance from the sun. While the area of the corona close to the sun is quite bright and easily seen naked eye without dark adaptation, the full extent of the coronal details can only be revealed by combining exposures taken over an 11-12 stop range, a much wider exposure range than normally handled by "High Dynamic Range" (HDR) processing techniques. Ongoing work on the image processing may lead to even better images.

Rob and I discussed and demonstrated techniques for processing eclipse images and Nico talked about blending narrow band data to achieve a balanced result.

Outdoor Activities at the September AP-SIG Meeting

Following the indoor part of the October AP-SIG meeting, we moved outdoors to do some imaging and demonstrate some of Rick's equipment. In particular, we demonstrated the Astro-Physics Right Angle Polar Alignment Scope (RAPAS) which is discussed separately.

At dusk, the group posed for a group shot in front of the DAS Astro-Physics 6" f/8 Refractor, seen above. From left to right are Nico Carver, Rick Davis, Rob Lancaster, Ron Worden, Bill Hanagan, Bob Trebilcock, Bob Jensen, Rob Greybill, and Dana Wright. Photo by Nico Carver.

At dusk, the group posed for a group shot in front of the DAS Astro-Physics 6" f/8 Refractor, seen above. From left to right are Nico Carver, Rick Davis, Rob Lancaster, Ron Worden, Bill Hanagan, Bob Trebilcock, Bob Jensen, Rob Greybill, and Dana Wright. Photo by Nico Carver.

Imaging M31 with the DAS Astro-Physics 6" f/8 Triplet APO

Rick Spencer and I set up the club's vintage Astro-Physics 6" f/8 Apochromatic triplet refractor on his AP1100GTO mount to demonstrate the RAPAS polar finder scope and to image M31 with the club's refractor. The photo at the beginning of this story (thanks to Nico Carver) shows us getting set up ahead of the meeting.

Our image of M31 appears below. The image covers 1.13 x 1.69 degrees and includes M31 (center), M32 (left), and M110 (lower right). The dust lanes in the outer areas of M31 have a brownish red appearance because of Hydrogen-alpha emission in those areas. There is also a very faint bluish area around the periphery, seen most prominently at the lower left tip of M31, where NGC 206 is located, though this may be too faint to appear readily in the FOCUS unless you magnify the image.

This image was produced from a mere 27 minutes of exposure time, broken up into nine 3 minute sub-exposures. Ideally, we should acquire more and longer sub-exposures to reveal even more detail around the edge of the galaxy.

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This image was a joint effort between Rick Spencer and myself. We used Rick's Orion thin off-axis guider (TOAG) and ZWO ASI120MC planetary camera for guiding. We used my Canon EOS6D DSLR and Windows 7 laptop for obtaining the images and controlling the guide camera. The pixel scale was 1.11 arc-seconds / pixel, nearly ideal for deep sky imaging on nights with typical seeing conditions.

Guiding with the Orion thin off-axis guider (TOAG) and PHD2 worked beautifully in combination with the Astro-Physics 1100GTO mount, despite using the ASI120MC for guiding, which has much smaller pixels than desired for guiding and suffers about a 3x loss of sensitivity due to the Bayer color matrix. All 9 of the 3-minute images were good, with no evidence of any star trailing due to tracking errors.

I used Pixinsight for all of the image processing. At the following link, there is an excellent prescription for processing DSLR galaxy images in Pixinsight using M31 as an example. I followed that prescription for the most part, but fine-tuned the noise reduction and color enhancement steps to match our data.

http://www.lightvortexastronomy.com/tutorial-example-m31-andromeda-galaxy—dslr.html

Like most images of M31, the color you see here is greatly enhanced. The color in M31 is not at all pronounced and if you don't enhance it, a normal full-color image of M31 looks like a B&W image once the light pollution color cast is removed.

Although several of the stars in the image were saturated, you will notice that there is still a decided lack of significant color fringes around the stars, even with magnification and color enhancement. Of course, you can aim this scope at a brilliant star like Vega or Sirius, take an exposure that saturates those stars a million times over, and then point to the color fringes. But, in the absence of spectacularly bright stars this OTA still has great potential for imaging.

Even more detailed images could be produced using this OTA by equipping it with a better focuser and a field-flattener / focal reducer combination. Ideally, this scope should be kept in an observatory, but for the foreseeable future there is no DAS observatory space for it and the new SkyShed POD is not large enough for it to be mounted at a height that is also conducive to visual observing.

(Imaging the "Heart" and "Soul" Nebulas Using Narrowband Filters (photo by Nico Carver with text summary by Bill Hanagan)

Also taken was a 3.8 x 5.0 degree wide-field narrowband image of the Heart and the Soul nebulas (Sharpless2-190, IC1805; and Sharpless2-199). The "Soul" is on the lower left and the "Heart" is on the upper right. In all, 2.5 hours each of OIII and Hydrogen-alpha data were obtained through multiple 5 minute sub-exposures, then aligned and stacked as usual to produce the result. But something is corrupting the data of this image and it is not able to be illustrated here.

This image was made using a Canon EF200 f/2.8 LII lens and a monochrome cooled astronomical imaging camera (ZWO1600mm) mounted on an EQ6 equivalent mount equipped with an auto-guider. Despite this being a very wide-field image with a relatively forgiving image scale of 3.92 arc-sec per pixel, auto-guiding still proved to be essential and it took some time to get the guiding to work correctly.

The image was pre-processed in Pixinsight. Post-processing enhancement was done in Photoshop using tone mapping for color balance between the nebula features, similar to the Flying Bat and Squid that Nico showed at the September AP-SIG meeting.

Imaging the Mexico Nebula (aka the "Mexican Space Dragon")

Rob Lancaster imaged the Mexico part of the North American nebula (NGC7000) using his ST8300 cooled astronomical CCD camera equipped with a Hydrogen-alpha narrow-band filter. As it happened, Rob's image came up on his computer screen with the southern part of the Mexico section to the left, making it look reminiscent of a bearded Chinese dragon. We dubbed the result the "Mexican Space Dragon" and all had a good laugh! But again, the file was corrupted and unable to be used here.

Observers' Handbooks for 2018. . .

Reminder: I have ordered 10 Observer's Handbooks. 5 are spoken for. Discounted price is $27. Please let me know klynnking@verizon.net if you would like one.

The Astro-Physics Right Angle Polar Alignment Scope (RAPAS) by Bill Hanag

Following the indoor part of the September AP-SIG meeting, we moved outdoors to do some imaging and for a demonstration of the Astro-Physics (AP) Right-Angle Polar Alignment Scope (RAPAS) on Rick Spencer's AP 1100GTO mount. A polar alignment scope is not necessary for telescopes that are permanently set up in an observatory, as many a But, for roll-out or portable imaging rigs, they can greatly speed up the process of polar alignment.

The RAPAS has two major advantages over the straight-through polar alignment scopes which came before it. Fi the built in 90 degree bend in the optical path of the RAPAS saves you from craning your neck at a difficult angle as you often must with a straight-through polar finder. This also makes it practical to have your mount as close to the ground as your scope will allow, thus minimizing the effects of wind and vibration on long exposures.

Second, the alignment system, the reticle, and the optics used by the RAPAS enables you to achieve a more accurate polar alignment in less time using only the brightest star within two degrees of the visible pole—Polaris in the Northern hemisphere and Sigma Octans in the Southern hemisphere.

With the RAPAS, you don't need to rotate the reticle to line up dimmer stars in the area at the same time you lin up Polaris, as previous polar alignment scopes required you to do. Instead, your time and location are used to calculate t current hour angle for the pole star. You then simply move the image of that star to the corresponding position on the reti in the RAPAS using the mount's altitude and azimuth adjustments.

If you don't want to take a cell phone, tablet, or lap into the field, you can calculate the correct hour ar your alignment star on-site by simply subtracting t hour angle for your pole star from the local siderea (LST) provided by the mount's hand paddle. The c radial distance of your pole star from the celestial can be considered constant over a period of week you can find this distance using one of the free pro before travelling to your imaging site.

While the RAPAS comes pre-aligned and works w out of the box, you can re-align the RAPAS if nece To do this, you need to first align your mount using another high accuracy polar alignment technique, as the **GTO Quick Star Drift Method of Polar Al ment**, *or the PEMPRO Pole Align Wizard (softwar included with many AP mounts and some CCD ca Then, the mounting adapter push-pull screws and RAPAS reticle set screw can be used to fine tune*

We will host this outreach event at Fair Hill Park.

The schedule is as follows:

6:00pm: Campfire talk at McCloskey Campground
7:00pm: Begin observing
9:00pm: Outreach event over. DAS members welcome to remain in park for further observing

The observing site is here:

https://www.google.com/maps/dir//39.7219832,-75.8306043/@39.7191421,-75.8288245,16.75z

Keep an eye on the Yahoo group for further information
- Greg

Lost and Found: Dark Sites by Fred DeLucia

There's nothing wrong with any size telescope that a good dark sky doesn't fix. That's been my mantra ever since my first visit to Cherry Springs State Park with my 8" SCT. A week prior to that a seasoned friend took me for my first dark site visit into Berks County, PA and I got hooked on the dark. I discovered that there are many more celestial objects available than can be seen in my locale. Consider that taking my 8" scope out of my neighborhood, which typically has 4.5 Naked Eye Limiting Magnitude (NELM), to a reasonably dark site of 6.0 NELM effectively triples the number of Messier objects that are easily seen, not to mention how bright and detailed the brighter ones become. The tripling of easier to see objects expands to even greater numbers of DSOs as aperture increases. That Berks County site is now restricted for post-dusk users by the PA DCNR as have other PA State Game Land parking lots for reasons that seem entirely due to a change in state administrative personnel. Similarly, in the last year, the State of NJ closed sites for after-dark use. Coyle Field in the Pine Barrens closed because of lack of licensing compliance by the Coyle Field Astronomers. But there's some hope for Coyle Field as another astronomy club sluggishly courts the State of NJ for re-admittance.

Although I haven't been to Cherry Springs in 5 years I've heard reports from long-time frequent goers that light intrusion from fracking wells' operations and unsupervised encroachment of observing space from non-telescope users are impeding quality dark time at the park. Disturbingly, reports of over-zealous, unofficial enforcers of the park's light-usage rules were at the point where some who were well within conformity considered it harassment.

PA and NJ dark sites aren't the only casualties. The Tuckahoe Equestrian Center "Stargaze" site was abandoned by the Delmarva Stargazers due to prohibitive costs and an expanding Baltimore light dome in lieu of the more affable and affordable accommodations of Trap Pond State Park. Near the Equestrian Center is the Ballfield used for Summer observing. It's flat, has a nice dark sky and there's no need to dance around the ubiquitous equine droppings as at the Equestrian Center. I think the Ballfield is still usable during the Summer if you're a member of the Delmarva Stargazers and permission is obtained from the park ranger office. Trap Pond is a 2 hour drive for me and not as dark as the Blue Mountain Vista Observatory Field near New Ringgold, PA which is actually a little closer since I live in SE PA.

Several of us pursue our New Moon/dark window/deep sky observing fixes by frequenting nearer properties like ChesLen Preserve in Chester County or Fair Hill NRMA in MD. Both of these sites are less than a half hour drive from Mount Cuba and require permission to access (details can be obtained from any DAS Board member at the monthly DAS meeting). They both yield 5.5 to 5.6 NELM skies, not super dark but quite serviceable. The still reliable DAS Sawin Observatory, although not as dark as any of the aforementioned, affords large aperture equipment on site, privacy, much camaraderie AND it's almost always available. No need to lug your equipment to the Sawin because DAS members trained to do so have use of the club's equipment, a fair compromise for the 5.0 NELM sky there.

Almost any good night at the Blue Mountain Vista Observatory Field or the Tuckahoe Ballfield will have a 6.0-6.1 or better NELM sky with a nice Milky Way. But getting darker than that can add hours to a drive for New Castle County or SE PA denizens. With accessibility to darker sites becoming more limited my proclivities now lean towards seeking overnight accommodations notwithstanding longer drives and longer observing sessions. I doubt such a practice will become de rigueur; however it is becoming a more frequent consideration as the battle for the dark wages on.

Which brings me to my most recent observing run.

As the tail end of the dark window approached the last weekend of September I drove 3 hours to a site that I had not previously visited. Praises from observing buddies claimed it to be an excellent alternative to Cherry Springs due to the shorter drive and its really dark sky. It's High Knob Overlook, located north of Rickets Glen and southwest of World's End State Park in PA and 2 hours closer than Cherry Springs. Its elevation is 2008', just a few hundred feet lower than Cherry Springs, and

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although there's a western light dome from Williamsport, the sky is DARK. Describing High Knob Overlook as having a bright granular Milky Way with a well-defined rift, discernible dark lane composition, plenty of stars and an easy naked eye Andromeda Galaxy (M31) is almost an understatement. I measured 6.39 NELM at zenith with my Unihedron SQM-L Sky Quality Meter.

Aside from being on the lookout for porcupines that enjoy chewing brake lines, the only distraction was upon arrival. There were a few Overlook visitors who were admiring and imaging the gorgeous sunset, feebly captured by my smartphone in a picture accompanying this article. With my 18" f/4.3 and my buds' 25" f/4, 22" f/3.6 and 16" f/4.5 Dobsonians, we gave these unsuspecting souls thrills of a lifetime with a surprise star party of the brighter Messiers and NGCs. The visitors were gone by 11:00PM, and then we had the Overlook entirely to ourselves all night… for two nights.

I did an interesting comparison between my 18" and the 25" for a short bit. Near the Ring Nebula (M57), there's IC 1256, an elliptical galaxy about 4' to the northwest with a foreground 14th magnitude star superimposed. The galaxy was a noticeable small gray smudge around that star in the 25" looking smaller than its 1' x 36" dimensions. M57 was quite the blue ring sitting in a rich field of stars and the central star was seen with direct vision. My 18" showed the Ring as bluish gray, the central star was there with averted vision and "blinked" in and out when using direct vision. The star field was not as rich and IC 1296 looked like a very dim largish star. If one didn't know better it easily could be mistaken for such rather than a galaxy and missed altogether which is apparently what I'd been doing for years until seeing it in the 25".

Most of my time was dedicated at my scope, as did the others to theirs. Often one would shout out an object that seemed impressive through the eyepiece in play and we'd all amble over to take a look. And so it went for two nights. Exploring the galaxies in Pegasus, ticking off objects from our respective observing lists, like the Horsehead or delving into the ARP and Hickson catalogs not struggling with too much difficulty to see ever dimmer galaxy groups, counting the galaxies in the groups we found and taking the occasional breather with a bright globular cluster.

An easy find, with the help of my NexusDSC, was the newest comet, C/2017 O1, then in Taurus, large with a very diffuse body surrounding a dim core and no tail. I did finally see Pease 1, the 3" planetary nebula near the middle of M15. Working up to 611x using a 3.7mm Ethos eyepiece and blinking a Lumicon OIII filter in and out with my filter slide I was able to catch it with averted vision and hold it. It wasn't "easy peasey" but pretty exciting seeing the circular, bluish, tiny delicate soap bubble. I tried getting my buds over to my scope to confirm it but they declined declaring that it was too headache inducing when they saw it in their scopes years ago.

As dawn approached I realized I was feeling the inevitable fatigue of long hours at the eyepiece. I sauntered to the edge of the Overlook and below I saw a large dense fog, more like a sleeping cloud (see picture), resting peacefully among the trees, and spread throughout the valley. It was there both mornings, greeting the end of each observing session with its somnolent bearing, reminding me that all night observing sessions under cloudless, very dark skies tend to work on the appetite. It was time for a hot breakfast and then the merited comfort of deep slumber.

I wish clear, dark and steady skies to all.

(Interested in joining an observing run to a dark site? Email me at: fredworld@verizon.net and I'll drop you a note when planning starts, or just email me if you have questions.)

WELCOME New Members to the DAS!

Bill Berry and Ian Berry

We're GLAD to Have YOU on Board!

The Next AP-SIG Meeting is Scheduled for Friday, October 13 at 7:30 PM at Bob Trebilcock's Home by Bill Hanagan

Bob will give us a review of his astro imaging equipment and practice and I'll be giving the first part of a multi-part series on astro-imaging cameras. To start off, I'll examine the key characteristics of the most popular imaging sensors that are currently available and how those affect the performance of the cameras that use them. As usual, the specific details of the meeting, including directions, will be announced via DAS YAHOO GROUP EMAIL as well as by direct email to AP-SIG members, two days in advance of the meeting.

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.

Anyone interested in doing 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. Further, some telescopes may be configured for imaging during the meeting and it may not be convenient to reconfigure them for visual use until after the meeting.

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.

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.

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***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 therei)

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 klynnking@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**.

Click Below To

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	
Astronomy Magazine	$34.00	
	Total:	

Name_____Email Adress_____

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**

Board Members

Officers:

President: Rob Lancaster -- RLancaste@gmail.com -- also Webmaster

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

Secretary: Bill McKibben -- BillMcK21921@comcast.net

Treasurer: Diana Metzger -- (302) 290-2108 -- DMetzgerMD@gmail.com

Board Members at Large:

Bill Hanagan -- (302) 239-0949 -- hanaganw@verizon.net -- Astro-Photography Special Interest Group (AP SIG) -- Amateur Telescope Making Special Interest Group (ATM SIG)

Amy Hornberger

Dave Groski

Standing Chairs:

Publications: Joe Neuberger -- JRNeuberger@gmail.com --(302) 723-2734 -- also *FOCUS* Newsletter, articles & Photo Contributions & Submissions

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

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

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

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

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

See Preceeding 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 preceeding 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!

The Last Word. . .

***FOCUS* Editor**
Joe Neuberger

I've been pushing through some medical issues of late, which is why this issue is a bit abbreviated. But all is coming along nicely and I'm on the mend at present.

So I hope you enjoy this issue of the *FOCUS.*