



FOCUS

DELAWARE ASTRONOMICAL SOCIETY

Vol. 61, No. 8, October, 2019

**Next Meeting: Tuesday,
October 17**

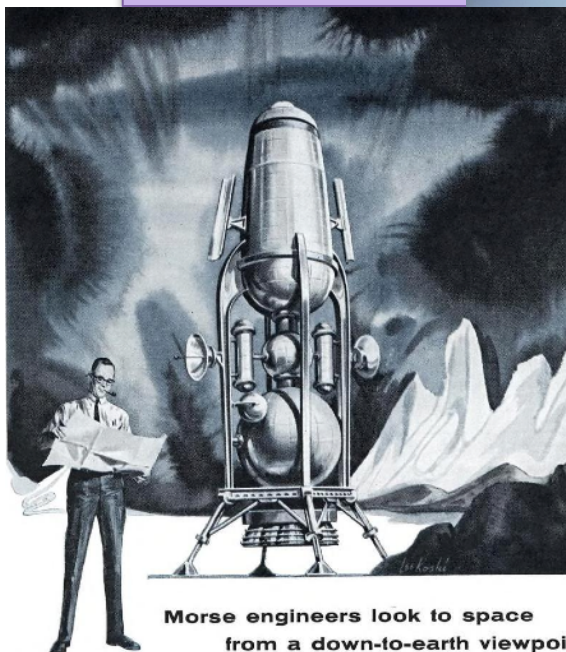
Mount Cuba Astronomical Observatory

Board meeting: 7PM

General meeting: 8PM

Meeting topic: **"Future Past - Concept
Spacecraft of the 1950s"**
Presented by Mike Turco

Review of early sci-fi spacecraft that shaped
our ideas for space travel, and actual concept
designs of the post-WWII era that predated
Apollo and the Space Shuttle.



Morse engineers look to space
from a down-to-earth viewpoi



Table of Contents

October Meeting Topic 1
From the President 2
DAS Board Meeting Agenda 3
Poetry Corner 4
DAS Astrophotography 5
October Scientist Birthday 12
<i>S. Chandrasekhar</i>
Intentionally left blank 13
AP-SIG Report 14
DAS Scientist in the News 22
Susquehannock Obs Site 23
Bellevue Park Outreach 24
Observing report, BVMO 25
In memoriam: 30
<i>Billie Westergard</i>
Camelopardalis 31
Loaner Equipment 33
Telescope Making SIG 34
lo groups membership 35
Club Membership 36
DAS Contacts 37

**FOCUS editor:
Richard G. Spencer
Publications Chair, DAS**

From the President

Rob Lancaster



Dear DAS Members,

As we advance into the autumn, the days gradually get shorter and shorter, which for most people means less time to do the outdoor activities that they enjoy. But we amateur astronomers are very lucky! The time we have to observe the night sky is getting longer and longer, and the night sky is getting more transparent as it cools off. And better yet, we can observe some of the best parts the sky, the summer Milky Way from Cygnus to Sagittarius, as well as the winter sights with Orion and Taurus at different times of the night, without freezing to death! I hope you can get outside to enjoy the lovely fall skies!

Over the past month, we have been doing loads of astronomy events. I hosted a very well attended AP Sig meeting at my house. The Astronomy Workshops and the book club meeting have been going very well too. We had several very successful outreach events, though the weather partially interfered, we held more events than we cancelled, which is a good improvement. The electrical work on the Pods is all complete, and the trench is filled in, now we are looking at getting the wiring work done inside the Sawin. We are also helping Mount Cuba to finish up the pods. They are in the process of getting weather sealed.

At our October DAS meeting, DAS member Mike Turco is going to tell us all about concept spacecraft from the 1950s. They did have a lot of interesting ideas when spaceflight was just getting off the ground, so I am very excited for the talk. This fall, our club will be doing lots of exciting activities. Jeff is working hard getting the monthly meeting talks planned out. Remember that each month we have an Astrophotography Special Interest Group meeting, a Book Club Meeting, and a full DAS meeting. Remember also that each Tuesday that is not a Monthly meeting, we will have the more informal Astronomy Workshops where you can pursue your interests in Astronomy. We also have an assortment of outreach activities planned where you can share your love of Astronomy. Please consider volunteering at or participating in some of these events. They really are a lot of fun and we really appreciate all you do for the club!

Thank you,

Rob Lancaster
DAS President



1. **Review of Minutes from Last Meeting—Bill McKibben**
2. **Treasurer's Report—Bob Trebilcock**
3. **Updates from October Meeting with Mt Cuba—Rob Lancaster**
4. **Club Loaner Equipment Discussion and Analysis**
5. **Plans for general Loaner Scopes: 3 Dobs, 1 refractor, 1 Schmidt ?**
 - a. **Which Schmidt: Old Meade, New Celestron, New Meade?**
 - b. **Which refractor? If any?**
 - c. **Plans for special “loaners” (extra training): Brandon, Lunt, Sunspotter ?**
 - d. **Equipment that should go with each loaner**
 - e. **Analysis of other equipment on the list Jeff distributed, plans for them?**

Poetry Corner

Faust has always been one of my favorite German texts. The overall theme is that of a “a Faustian bargain”, i.e. relinquishing your eternal soul for transient worldly advancement (spoiler alert: don’t do it).

I have heard this being mentioned more often lately than I can ever recall. In honor of that, this month’s Poetry Corner features a snippet from Faust. Much of this particular selection could have been written with the amateur astronomer in mind. —RGS



Johann Wolfgang von Goethe *Faust Part I*

Chorus Of Spirits



*VANISH, dark clouds on high,
Offspring of night!*

*Let a more radiant beam
Through the blue ether gleam,
Charming the sight!*

*Would the dark clouds on high
Melt into air!*

*Stars glimmer tenderly,
Planets more fair
Shed their soft light.*

*Spirits of heav'nly birth,
Fairer than sons of earth,
Quivering emotions true*



*Schwindet ihr dunkeln
Wölbungen droben!*

*Reizender schaue,
Freundlich, der blaue
Aether herein!*

*Wären die dunkeln
Wolken zerronnen!*

*Sternelein funkeln,
Mildere Sonnen
Scheinen darein.*

*Himmlicher Söhne
Geistige Schöne,
Schwankende Beugung*



*This year, the Metropolitan Opera in
NYC is presenting concert performances
of Berlioz's La Damnation de Faust*

Astrophotos by AP-SIG & DAS

Members

A Tale of 3 Witch's Brooms (the Western Veil Nebula, NGC6960)

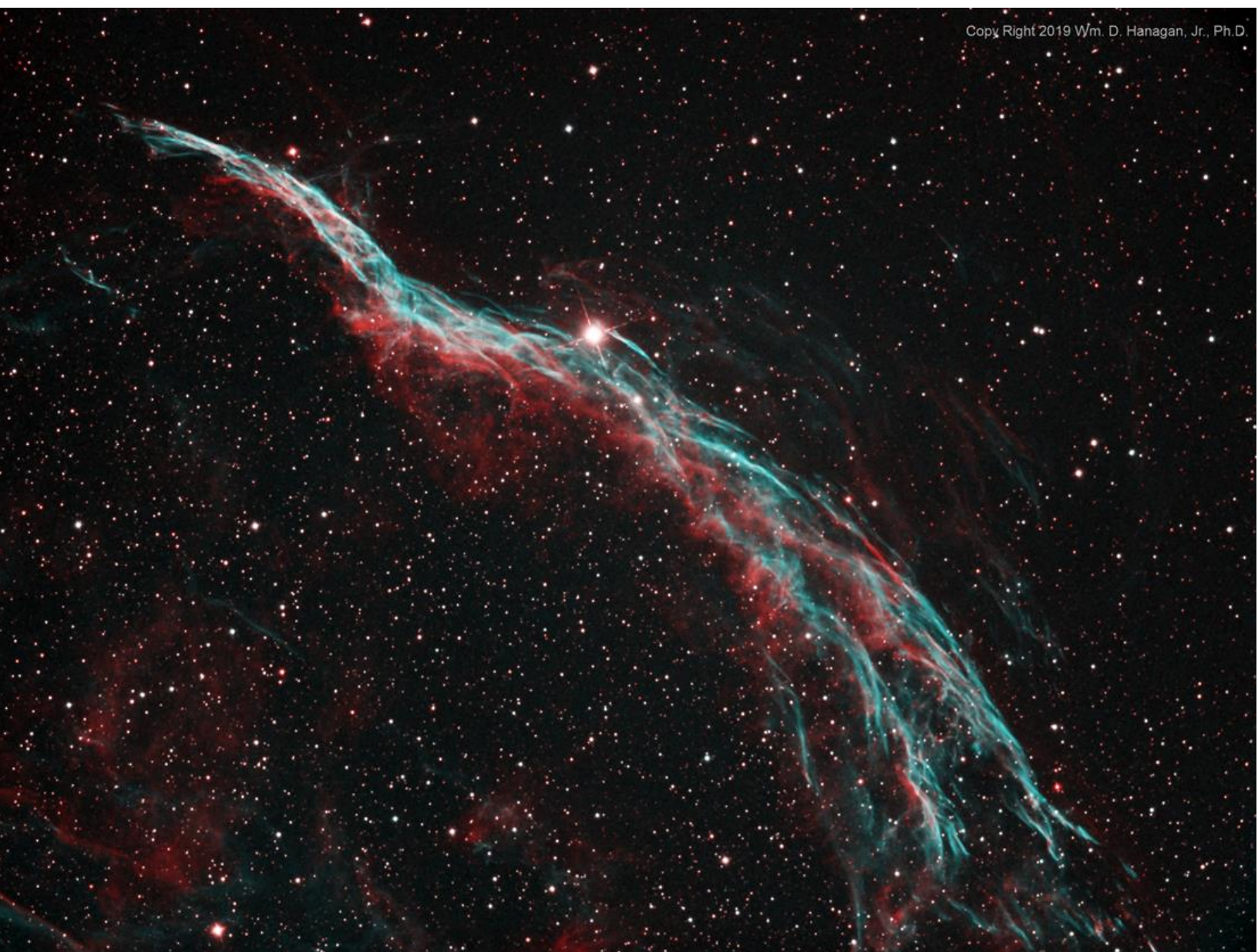
by Bill Hanagan

The following 3 images of the Witch's Broom were produced from data acquired jointly with Rick Spencer. It's very difficult at times to decide how much to stretch the tonal values in an image. Too little and the image may appear dull and lifeless. Too much and faint details can disappear. So, for this image, I thought I'd show you



three different stretches of the same image and see what you like the best! There are a lot of variables here that are not under my control, including the brightness, color calibration, and contrast of your computer monitor, the color response of your eyes, your viewing conditions, and even how the software used to assemble the FOCUS treats photographs. As a result, I can't be quite sure when I stretch an image what it will look like on your computer.

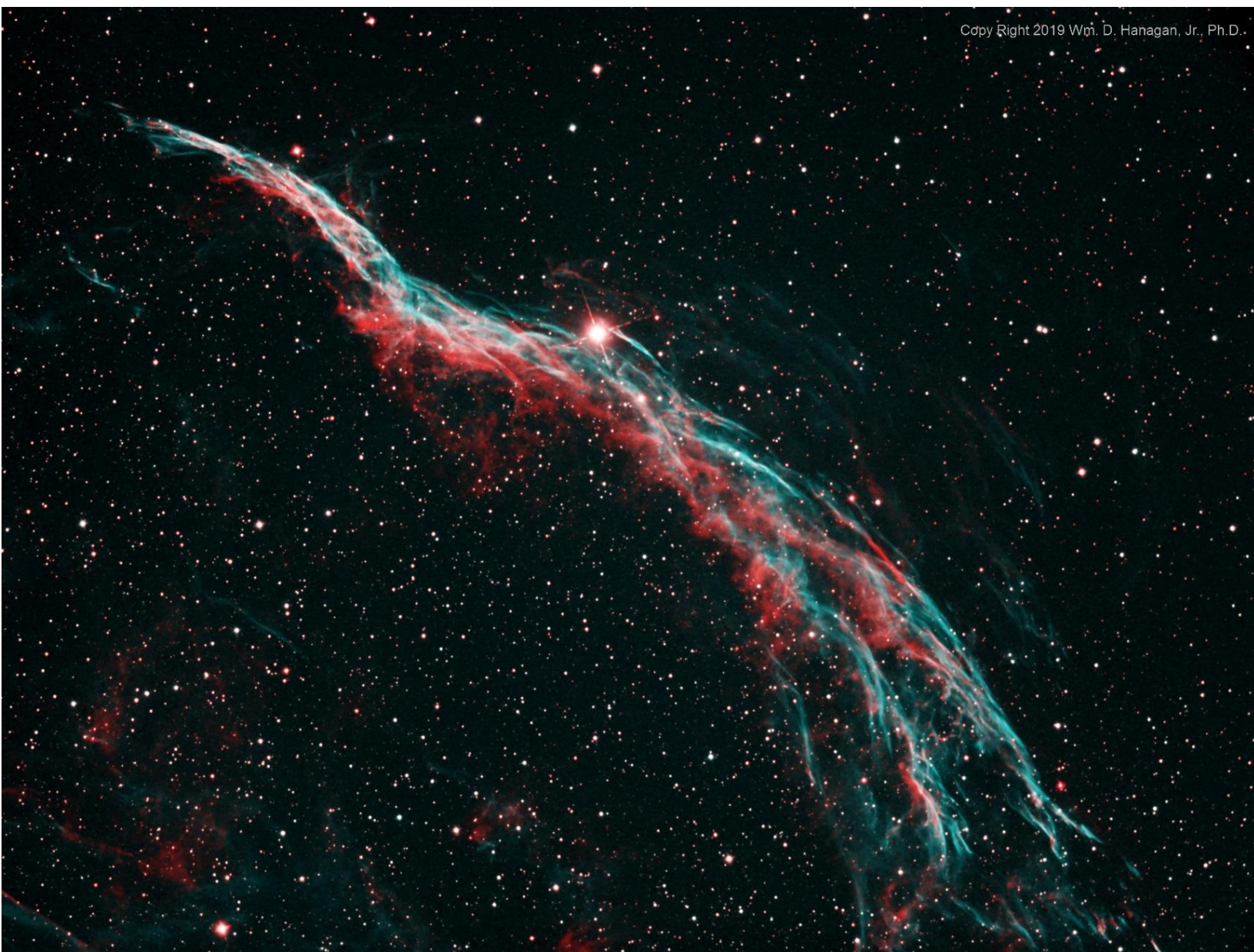
The first version, on the previous page, was stretched the least. The brightest areas of the filamentary nebula that makes up the main parts of the Witch's Broom appear to me to be relatively dull in the first image, but the details in the very faint areas of the nebula in the lower left corner and in the center immediately above the bright



filaments remain readily visible, at least on my monitor, even though they are fairly dark features. And, if you look carefully, you may notice more than a few faint wisps of teal or red scattered around.

In the second image, above, a slightly more aggressive stretch has made the main body of the witch's broom and its colors more pronounced while diminishing the darker parts of the nebula.

Finally, the strongest stretch of the three was applied to the image below. It makes the brightest parts of the nebula even more visible, but has made the darker features even less visible.



Be sure to let me know which version (1, 2, or 3) you like the most!

How the Witch's Broom Image Was Produced

In general, images were obtained using two different narrowband emission filters in the usual way, one H-alpha (656.3 nm, red) and the other OIII (500.7 nm, blue-green). These two "channels" were then mapped into a common 3-channel RGB image. The brightness of the master H-alpha image determined the brightness of the red channel of the RGB image, while the brightness of the master OIII image determined the brightness of both the blue and green channels of the RGB image. This approach is commonly referred to as "HOO" mapping for short (H→R, O→G, and O→B).

It should be noted that all of the data for this image was obtained on a night when the moon was 95% illuminated! This image is another demonstration of the fact that, with narrowband imaging, you don't have to wait for a moonless night to do astrophotography!

Data Acquisition Details for the Witch's Broom

- Total exposure time: 1 hour 40 minutes; 40 minutes for H-alpha (3 nm bandpass) and 60 minutes for OIII (3 nm bandpass)
- Sub-exposures: 10 minutes each, dithered, with H-alpha acquired first to minimize the effect that moonlight would have on the OIII data.
- Date and Site: Rick Spencer's back yard, 8/12/2019
- Sky conditions: clear.
- Optics: 10" Takahashi CCA-250 with an 0.72 focal reducer, operating at 890 mm and f/3.6 (f/4.4 based on the amount of light blocked by the central obstruction)
- Telescope mount: Astro-Physics AP1100GTO with CP4
- Imaging Camera: QSI-683wsg8, with off-axis guider (OAG), operated at -10C
- Guiding camera: Starlight Xpress Ultrastar, mounted in the OAG
- Software: Windows 10, ASCOM, Astro-Physics Command Center (APCC), Cartes du Ciel (SkyChart), Nebulosity4, and PHD2

Image Processing Details for the Witch's Broom

I did all of the image processing in PixInsight 1.8. The most important processing steps are described sequentially below. Combined words like “ImageCalibration” and “StarAlignment” are not typos—they denote specific PixInsight Processes and Scripts that were used to transform the raw data into the intermediate “master” images and eventually into the final image.

- All sub-exposures were calibrated against a single master dark frame made using 24 x 10 minute dark frames.
- The sub-exposures were examined using Blink and none were rejected.
- StarAlignment and ImageIntegration were employed as usual to produce separate Ha and OIII master light frames.
- CosmeticCorrection was used to remove the remaining hot pixels and faint cosmic ray trails.
- The maximum shift of any image for each of the 4 edges was determined using Blink. DynamicCrop was used to remove the affected pixels from both master light frames.
- DynamicBackgroundExtraction was used separately on both the H-alpha and OIII masters.
- MultiscaleLinearTransform was applied separately to both masters to reduce background noise.
- Both the H-alpha and OIII masters were given a preliminary stretch with HistogramTransformation before being mapped into the RGB image.
- The H-alpha and OIII masters were combined using PixelMath according the HOO mapping scheme to produce the final RBG image.
- The three different FINAL stretches were performed using CurvesTransformation.

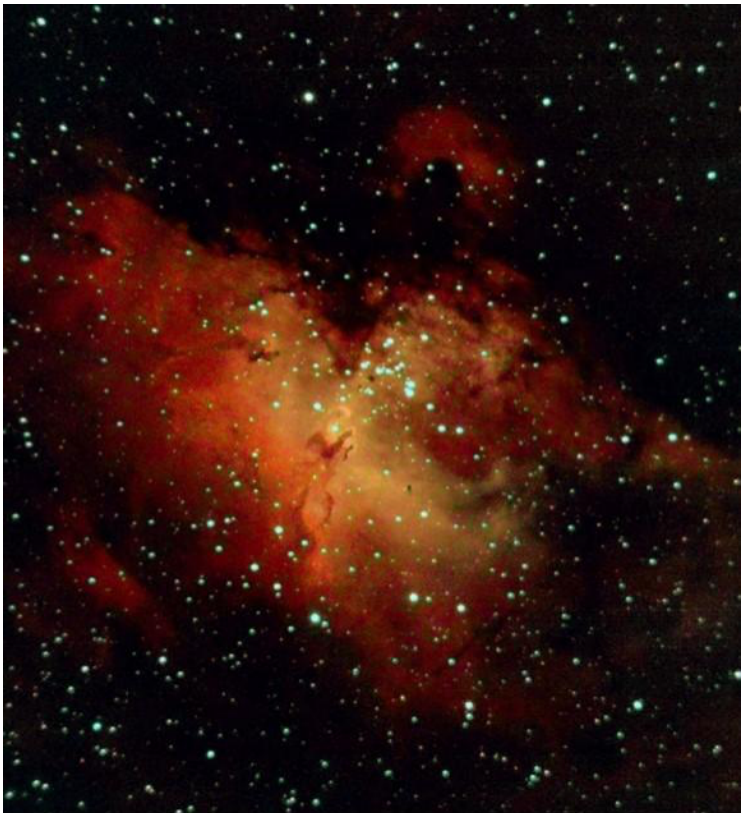
--Bill Hanagan

From the camera of Ron Worden



M16(NGC 6611) The Eagle Nebula, also known as the Pillars of Creation, Star Queen Nebula and the Spire, is an open cluster of stars in the constellation Serpens.

**M16(NGC 6611)
Constellation: Serpens**



Date: 08/29/2019

Location: Snobie Observatory/Lincoln Control Center.

Bear, Delaware W75° 40' 43.04" N39° 34' 39.7"

Telescope: ED102CF Refractor + .8x Focal Reducer F/5.6 , FL 571mm, Guide Scope 60mm Prime Luci Labs

Mount: Losmandy G11 Guided with Dithering
Cameras: SBIG ST2000XM + ZWO174 autoguider(+/-1 arcsec)
Temperature: ~60°F cooled to -5°C
Filters: Sii,Ha,Oiii,Hb
Exposure: 23LFs-300sec subs(1.92hrs) (5Sii,6Ha, 6Oiii,6Hb)Combined Sii & Ha and put in the Red channel Oiii in Green channel, Hb in Blue channel
Software: PixInsight
Frame: 54.4 x 71.2 arcmin
Calibration with: Master Dark from 10 dark frames
Observer: Ron Worden

Contribution from Mark Mitchell

“Form and Function”



3 hour exposure of the Hercules Globular Cluster (M13) that I made with my 5 inch refractor on 9-20-19.

The galaxy at the upper right is NGC 6207. There is another galaxy visible between the cluster and NGC 6207 - it's IC 4617.

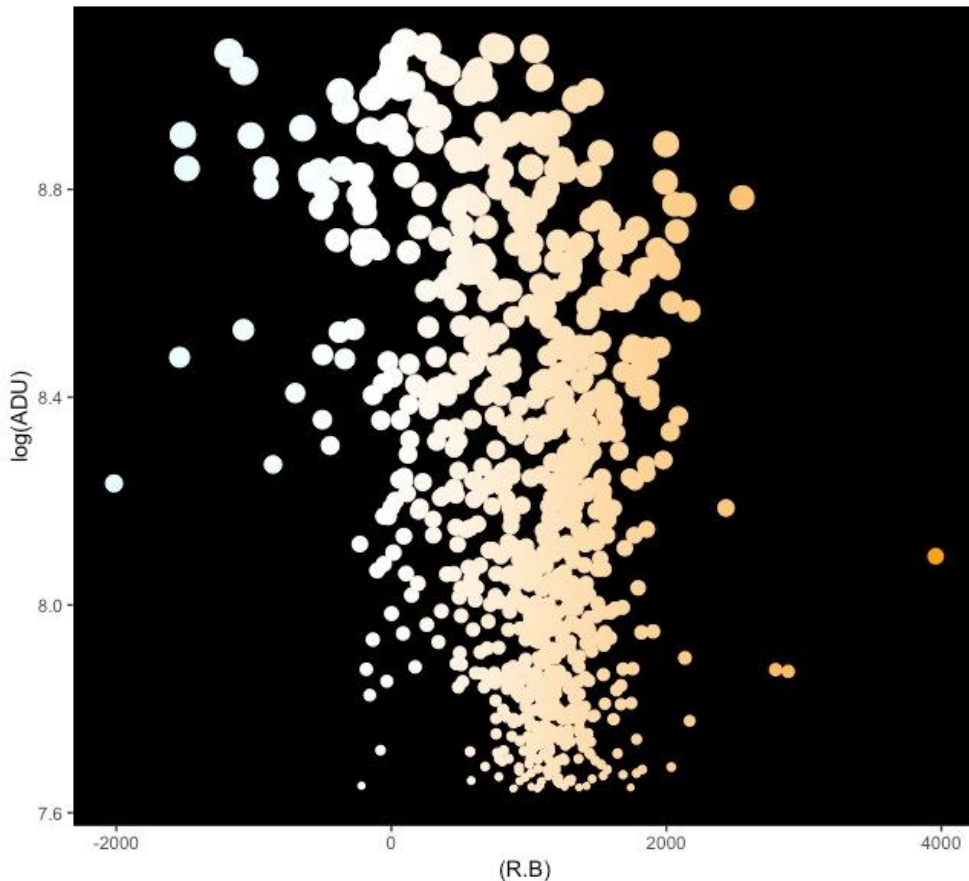
In the central part of the cluster there are about 100 stars in a three cubic light year area. If there were a planet with intelligent life on it (or even ignorant life) in the central cluster, the sky would never appear very dark because of the hundreds of brilliant stars in the sky.

The second image is an H-R diagram made from data from 809 of the stars in the cluster.

Notice these stars are so ancient that only the middle part of the main sequence is present in the diagram.

The data points are scaled so that as the stars age and run out of hydrogen they ascend on the chart and get bigger.

H-R diagram. M13. $\log(\text{ADU})$ vs $\text{ADU(R)} - \text{ADU(B)}$. $n = 809$



Milky Way-Scapes

Ryan Gilbert



Roadside scene in Lancaster County, PA. The road was isolated enough to let me get a faint view of the Milky Way between cars, and their headlights gave a warm glow to the foreground, contrasting the cool tones of the sky beyond.



Starscape of a coastal scene at Port Mahon, Delaware. This was in September, and Jupiter is visible as the brightest point in the sky. The fisherman at the end of the pier didn't know his lantern (and its long reflection) provided a nice focal point to mark the end of the pier, but the visual weight it provides made a satisfying counterpoint to the stars in the background.

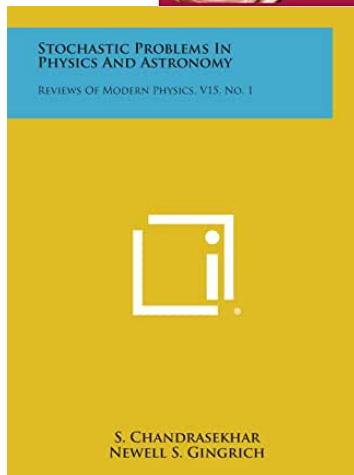
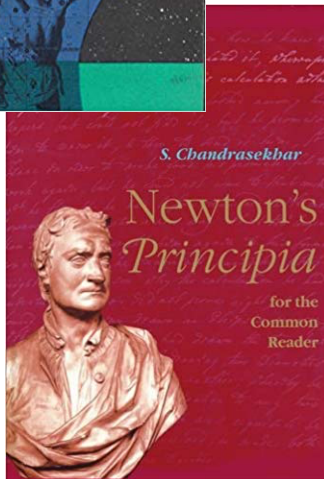
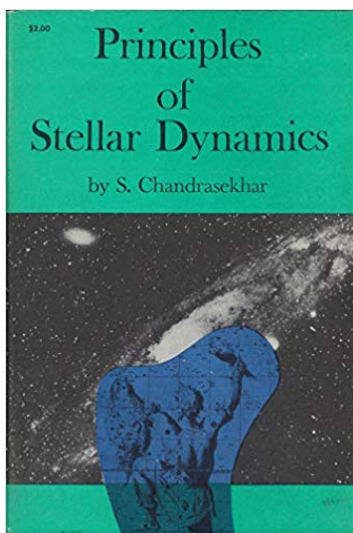
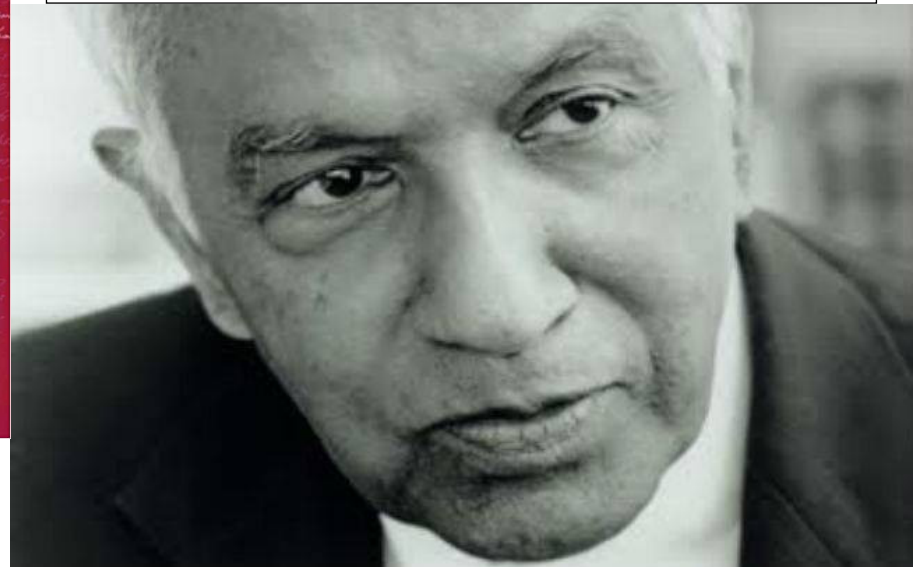
Both images: 24mm lens, f/2.8, 15 seconds, ISO 2200, 35mm-size digital sensor, 10 exposures stacked for noise reduction with the sky and foreground stacked separately in Sequator to compensate for Earth's movement, and recombined. Post processing done in Lightroom.

October Scientist Birthday

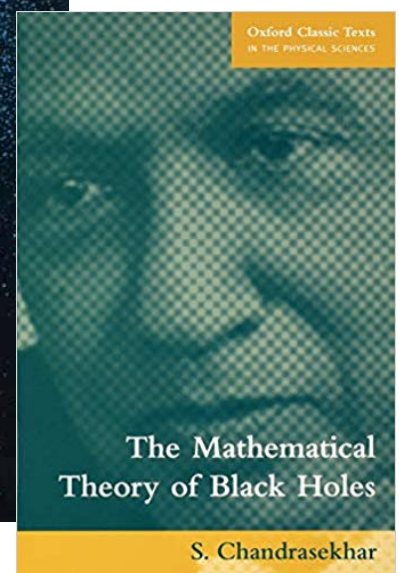
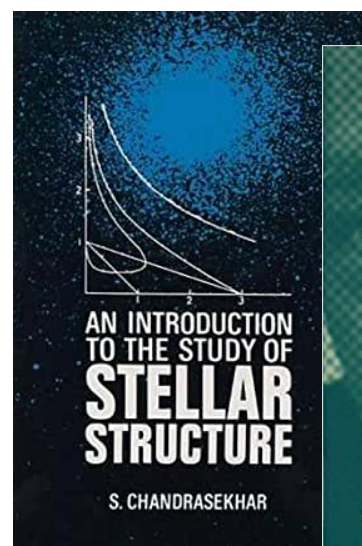
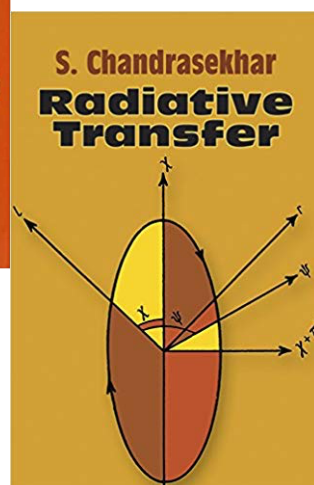
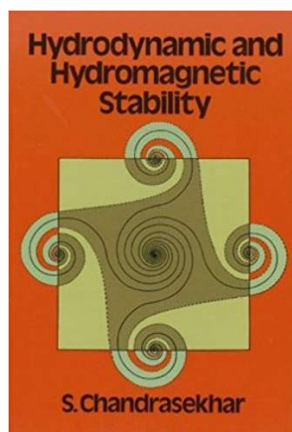
Subrahmanyan Chandrasekhar

19 October 1910 - 21 August 1995

Nobel Prize, 1983: "for his theoretical studies of the physical processes of importance to the structure and evolution of the stars"



By analyzing the competing forces of gravitation (acting to potentiate stellar collapse) and the quantum mechanical exclusion principle (opposing collapse) within a stellar remnant, Chandrasekhar found that a dying star with a mass greater than 1.4 solar masses cannot become a white dwarf; the gravitational force towards collapse is too great. This value of 1.4 solar masses is now known as the "Chandrasekhar Limit".

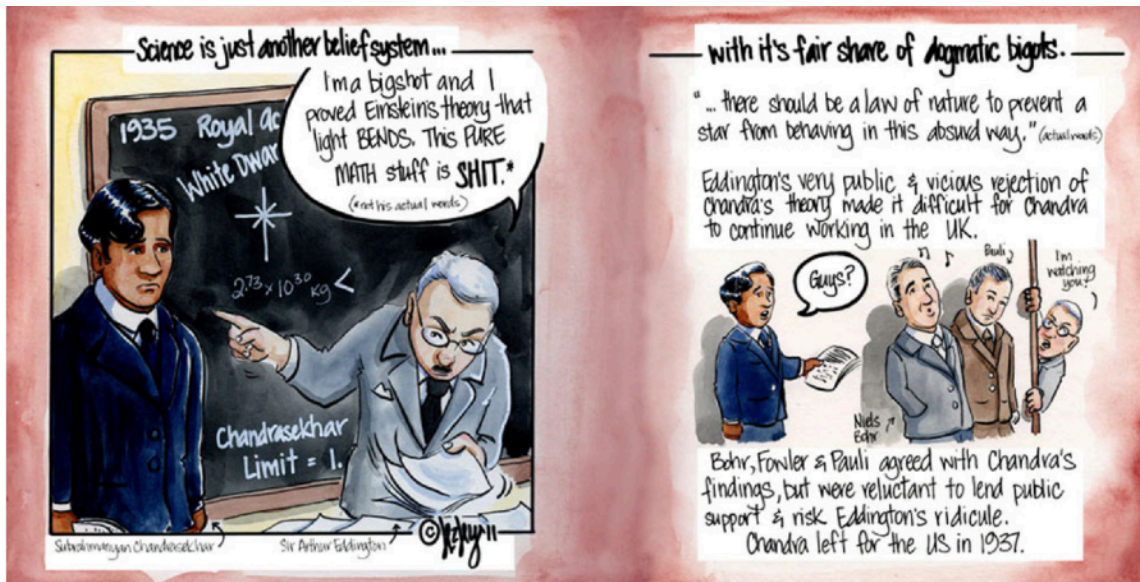


A favorite Chandrasekhar anecdote, for those of you who might not already know this. And, it's not really an "anecdote".

At the tender age of 19 (nineteen), Chandrasekhar famously derived the famous white dwarf mass "limit" of 1.4 solar masses while on a transatlantic cruise. (Rumor is that the work was done while standing in dinner buffet lines). His result indicated the creation of some new form of matter (we now know these forms as either a neutron star or a black hole) for stellar remnants heavier than that limit.

Sir Arthur Eddington, the pre-eminent astrophysicist at the time, mocked the young student, saying: "I think there should be a law of Nature to prevent a star from behaving in this absurd way."

Of course, Chandrasekhar was right, and Eddington was wrong.



Subrahmanyan Chandrasekhar (left), Gerard Kuiper, and Otto Struve chat on the grounds of Yerkes Observatory around 1950. Credit: AIP Emilio Segrè Visual Archives <https://physicstoday.scitation.org/doi/10.1063/PT.6.4.20180706a/full/>

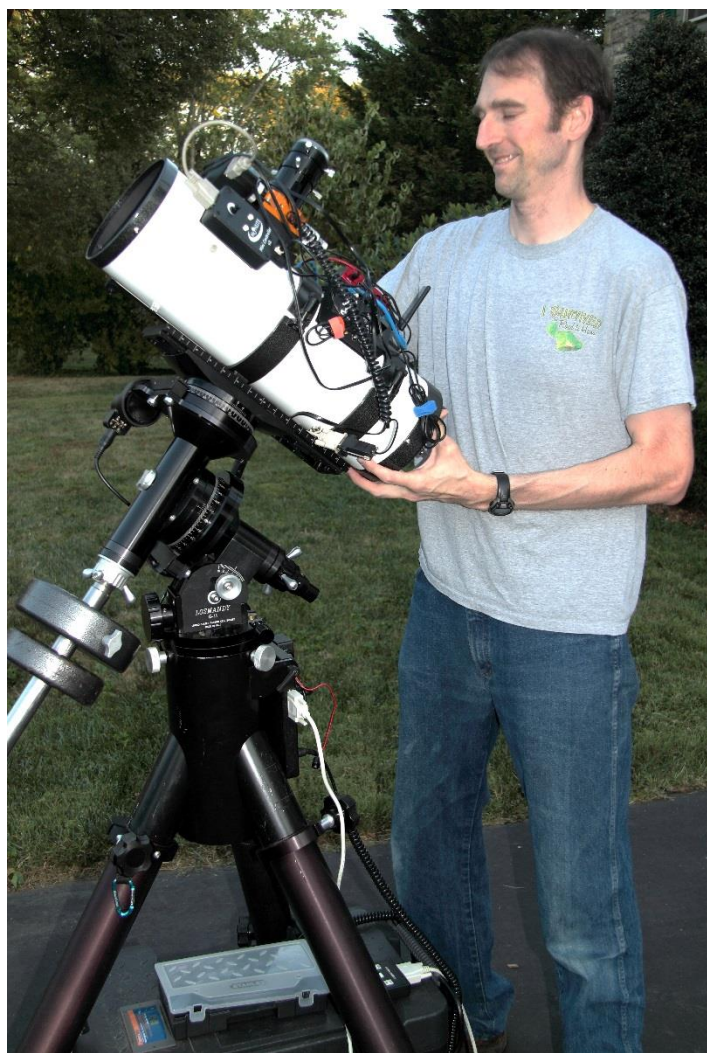
This page intentionally left blank because I can't think of anything or anyone that can follow Chandrasekhar. Well, Fermi could, but he was last month.

The September AP-SIG Meeting Report and the Upcoming October AP-SIG Meeting Reported by Bill Hanagan, AP-SIG Founder

Elephant Trunk detail by
Mark Mitchell

September 2019 AP-SIG Meeting Report by Bill Hanagan

The September 21 AP-SIG meeting was held at Rob Lancaster's home in north Wilmington. We started out in Rob's driveway in the early evening while it was still light enough to see one of Rob's "transportable" imaging rigs, which appears in the photo below.



This rig is based on a Losmandy G-11 mount with a Gemini-1 level 4 GOTO controller and a TPO 6" f/4 Newtonian OTA (made by Guan Shen Optical). Rob reports that this particular OTA shows obvious astigmatism on either side of focus. Like all optical aberrations except for distortion, astigmatism causes the in-focus image to be blurrier than it might otherwise be.

Like many low cost Imaging Newtonians, the focuser on this one was problematic so Rob replaced it with a motorized MoonLite Crayford focuser.

Rob uses this scope with a Paracorr coma corrector, giving it an effective focal length of about 700 mm at f/4.6. With his SBIG ST8300 monochrome CCD camera, this optical arrangement has a pixel scale of 1.59 arc-seconds / pixel, which makes the images slightly

"under-sampled" on nights of average or better seeing. On the plus side, the short focal length of this scope increases the field of view.

Rob's ST8300 is equipped with a filter wheel sporting an LRGB filter set as well as H-alpha and OIII narrowband filters. Rob regularly uses his narrowband filters to photograph emission nebulae from his light-polluted neighborhood in north Wilmington.



Above, the on-time arrivals pose for a quick group shot before heading inside. From left to right are Tom Fielding, Bob Trebilcock, Rob Lancaster (our host), Dana Wright, Ron Worden, and Bill Hanagan. Jarrod Bieber, Sidney Ocampo, Erin Farmer, her daughter Emma, and Mark Phillips arrived a little later. A total of 11 AP-SIG members and guests attended the meeting.

Once indoors, Ron treated us to a dinner of Capriotti's sandwiches and assorted soft drinks as well as a variety of deserts, as seen in the photo on the next page. Erin Farmer also brought out a desert for us, though I didn't get to try it myself (thanks Erin!).



Afterward, we took a tour of Rob's basement workshop where he showed us his woodworking tools. Rob has equipped his shop with several self-made conveniences including a heavy duty "butcher block" workbench that he made himself, along with a dust collection system.

After seeing Rob's workshop, we headed back to the family room to review everyone's recent astrophotos on Rob's wide-screen TV, some of which appear elsewhere in this issue of the FOCUS. Sidney Ocampo (below left) also brought along a miniature low power display that he has recently been working to connect to his own electronics.



Next, Rob gave us a demonstration of some of his Ekos routines as well as his imaging rig. Over the years, Rob has helped to analyze and debug many problems with this program and helped other AP-SIG members to get it working on their own imaging rigs. He has also contributed major sections of code to the program.

Rob uses a Raspberry Pi mounted on his telescope to handle equipment control and data acquisition, but it has no monitor, keyboard, or mouse, so it doesn't eliminate the need to use a computer while imaging. However, it does allow Rob to take his laptop with him into the house while his images are being acquired. Unfortunately, the Raspberry Pi doesn't run the vast majority of astronomy software available under Windows, nor does it run the Windows ASCOM drivers, the



only software support provided by the manufacturers of many computer controllable astronomy products.

Once everything is up and running, Rob controls his imaging rigs remotely using his Apple laptop. During the meeting, Rob demonstrated his system, but either the Raspberry Pi or the Wi-Fi connection locked up several times. Rob reports that it all became stable once more after everyone left for the evening, so he went on to do some imaging.

If a scope mounted processor appeals to you, and you're not willing to give up the software available under Windows or ASCOM drivers, there are many surprisingly capable small form factor mini-PCs about the size of a book that are great choices for controlling your imaging rig. For example, several different versions of the Intel NUC (next unit of computing) and the Intel "ComputeStick" have been used for controlling deep-sky imaging rigs. PrimaLuceLabs, an Italian vendor of astronomy gear, sells several different mini-PCs running Windows (<https://primalucelabusa.com/eagle.html>) which are specifically designed for astro-imaging. If you're worried about the temperature extremes in your area, several models from "FitPC" <https://fitpc.com/> can be configured to run Windows applications in temperatures ranging from -40F to 158F (-40C to +70C), including the Fitlet2 and FitletT.

Whatever the source, Windows based mini-PCs are easily controlled remotely using free "remote desktop" programs like TeamViewer, RealVNC, and TinyVNC over a LAN or Internet. Microsoft's own Remote Desktop, included in the Pro versions of Windows 7 and Windows 10, is another option that astro-imagers have used.

While there are a multitude of mini-PCs that can be mounted on your scope to act as intermediate controllers, most astro-photographers still just use an off-the-shelf Windows laptop or a Windows desktop close to the telescope because they need the keyboard, monitor, and mouse at their imaging rig anyway and they don't have to learn a new operating system to use one.

Frank Colosimo, who operates two observatories which host remotely controlled telescopes, uses dedicated Windows PCs for each telescope in his two observatories. He reports that desktop PCs are extremely reliable, even in the wintertime, as long as you avoid hard drives in the multi-Terabyte range. Other experienced AP-SIG members, including Dave Hockenberry and Joe Morris, also report that the Windows laptops that they have used have worked reliably in the cold and damp conditions of their observatories for years.

If you think your particular computer might be more sensitive to dew than most, or you would simply like to be cautious, there are many ways to fashion a dew shield for your laptop. Ron Keating of DewBuster fame has instructions at the link below for creating a folding laptop dew shield.

<http://www.dewbuster.com/dewshield-laptop.html>

Also, a large plastic storage bin turned on its side makes a convenient dew shield for a computer. Lowe's has a very large bin (at the link below) for a mere \$11 that's even large enough for my 17.3" laptop and will work very well for a 15" laptop.

<https://tinyurl.com/y3ytxhkv>

The nice thing about this approach, which was first brought to my attention by Rob Lancaster, is that the plastic storage bin can be used to carry or store gear before and after you use it as a dew shield.

There are many smaller bins that work equally well for smaller laptops that are easy to find, so I won't bother including links for them.

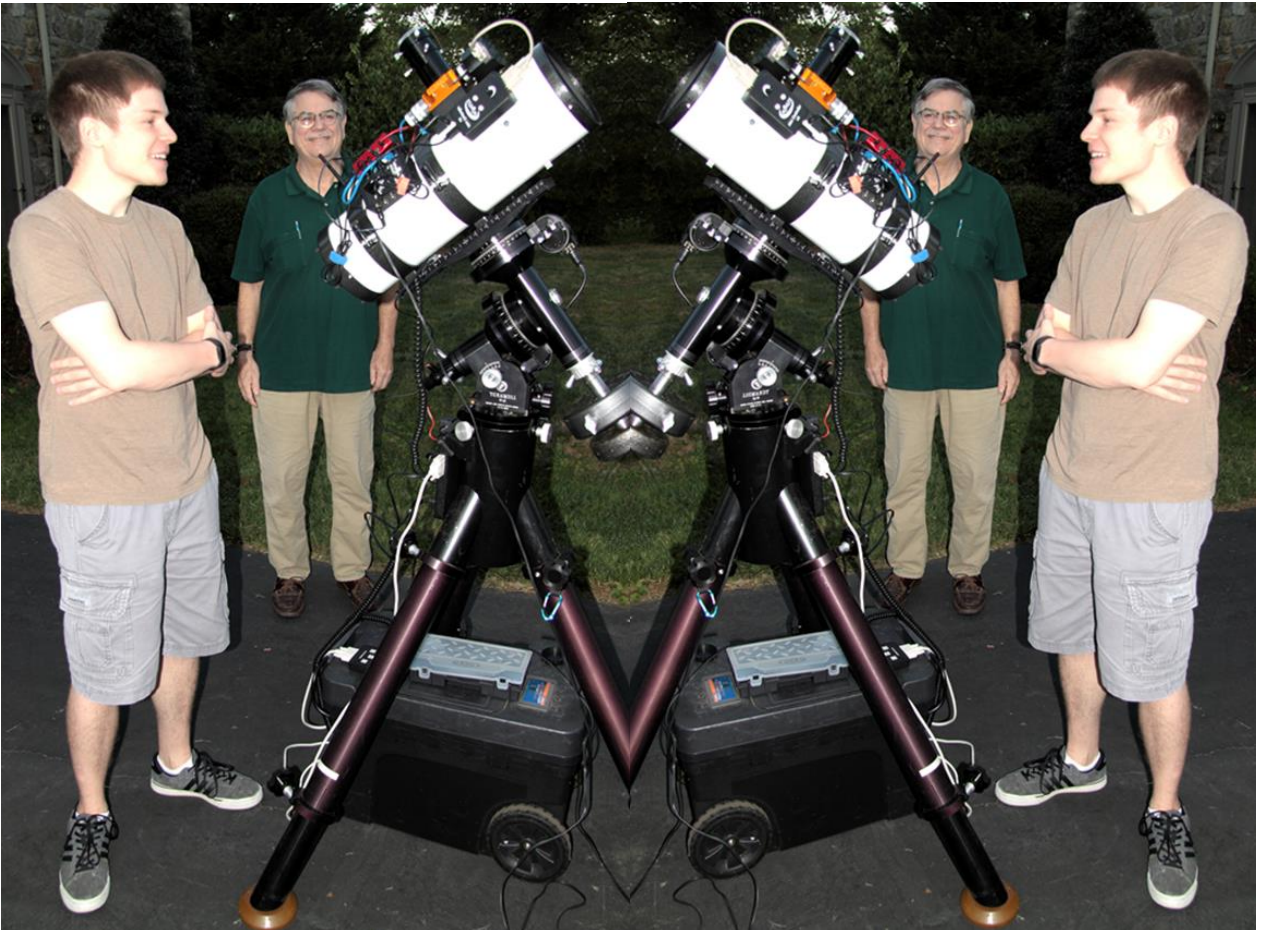
When operating in an open field on an exceptionally dewy night, I sometimes use a hood or plastic bin like those described above to protect my own laptop, but I usually don't bother with one on most nights because the computer acts as its own dew heater—there's enough heat coming out of my computer and its flat panel display to prevent significant dewing unless the computer is turned off.

If you're still worried about using a stock PC for telescope control and you feel compelled to get something with extreme environmental ratings, there are NEMA4 rated all-in-one industrial PCs that are completely sealed against dust as well as water intrusion. The Vartech models at the link below are a good example, but there are many experienced imagers who will tell you that this is unnecessary overkill.

<http://www.vartechsystems.com/products/panelpc/default.asp>

Finally, if want to control your imaging rig using a remote computer without placing a computer close to the telescope, one very reliable way to do it is with the Icron Ranger 2304, which extends 4 USB 2.0 ports over a CAT5e (Ethernet) cable up to 330 feet long. The downside here is that the computer won't be close to the imaging rig for the inevitable problem solving that you'll have to go through to get everything up and running. Here's the link. <https://tinyurl.com/y5j49dvk>.

Below right, Tom Fielding and Jarrod Bieber can be seen discussing Rob's portable imaging rig.



Plans for the October 25 / 26 AP-SIG Meeting by Bill Hanagan

The October meeting will be held on site at Rick Spencer's home west of Fairhill, MD. The exact date and time of the meeting depends on the weather and will be announced via DAS@groups.io email and by direct email to the AP-SIG members.

Among other things, we'll talk about Rick's plans for his observatory, for which concrete will soon be poured. As usual, we'll 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 with you to promote the discussion of image acquisition and processing techniques. 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 Scientist in the News!!!*

Our own Richard Spencer (your newsletter editor) presented the University of Delaware Department of Physics Colloquium on September 25, 2019, entitled:

Magnetic Resonance Relaxometry and Macromolecular Mapping: An Inverse Problem Framework, with Applications to Alzheimer's Disease and Osteoarthritis

Since many** of you have expressed interest, here is the abstract of the talk:

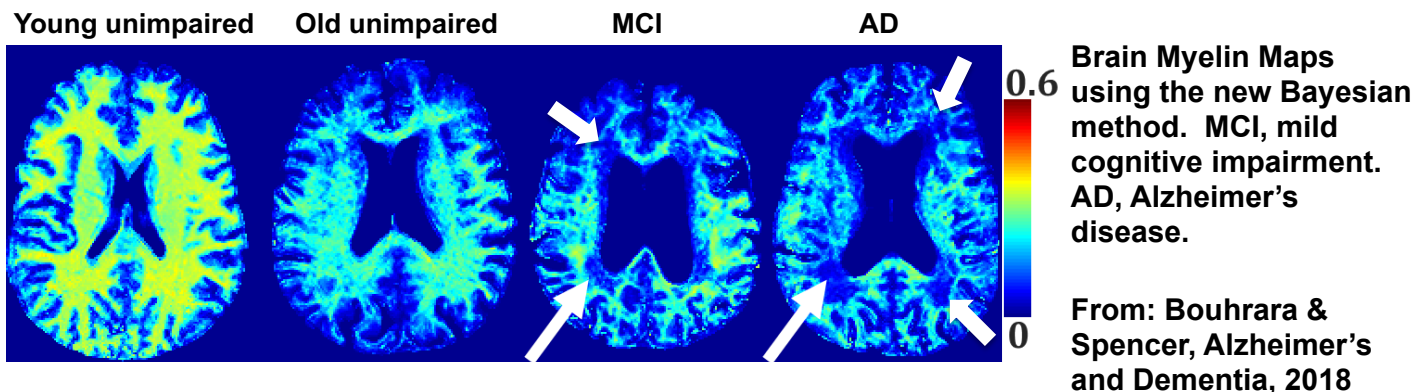
Quantification of changes in the macromolecular constituents of tissue is a major theme in biomedical magnetic resonance (MR). In many cases, constituents can only be distinguished through their differing water transverse relaxation times, instead of by frequency differences as is more familiar in MR spectroscopy. However, this requires implementation of multiexponential transverse relaxation analysis (METRA), a special case of the inverse Laplace transform, a notoriously ill-posed and unstable inverse problem. Our work in this area combines basic science studies with methodologies that carry immediate translational potential. We will discuss METRA as a means to quantify the myelin water fraction (MWF) of total brain water as a marker for myelin, a critical element of signal transmission within the central nervous system, in the mathematical setting of a linear inverse problem. In addition, we have stabilized MWF estimates using a rapid steady-state MR pulse sequence through Bayesian analysis of the corresponding non-linear inverse problem. With this, we provide the first report of myelination deficits using direct MWF measurements in subjects with mild cognitive impairment and Alzheimer's disease. We have implemented similar methods to map cartilage proteoglycan, the macromolecule most vulnerable to loss in osteoarthritis, obtaining results indicating the potential for improved detection of this condition. Finally, we describe extensions of METRA to higher dimensional experiments, with two or more independent time variables. We discuss the stability of parameter estimates from these experiments, as well as correlation experiments providing insight into chemical exchange between macromolecular constituents. All of these studies are directed toward the clinical goal of improving the ability of MR to diagnose pathology and monitor disease progression, and to define therapeutic targets for treatment.

One faculty member commented "I thought the talk was fine until you got to the filtering part."***

*This is a gross exaggeration.

**Thanks Mark M.!

***This is true.



SUSQUEHANNOCK NIGHTS

Mark Jacobini

Would you be interested in an additional dark site that is within a 1.5 hour drive of the Wilmington area?

Would you be interested in attending a star party next year that was within a two hour drive?

If you answered “Yes” to either of those questions, read on.

I recently came across the article below on Cloudy Nights and its title piqued my interest. After reading it, I was excited that there is another potential site that may be available to us that is reasonably close to DAS members in SE PA and Northern DE. Please follow the link below and read the review to see if Susquehannock (PA) State Park (SSP) appeals to your inner astronomer.

<https://www.cloudynights.com/articles/cat/articles/york-county-star-party-r3206>

When you read Glen Ward’s writeup you may be just as excited as I was. Susquehannock is located in Drumore PA adjacent to the Excelon’s Muddy Run Observatory. The proximity to Muddy Run would indicate that the sky is darker than is usually found in Southeast PA. Lightpollutionmap.info shows the park as a Bortle 4, and the SQM rating is 20.93. Zenith visual magnitude is in the 4.5 – 5.0 range. Susquehannock isn’t quite as dark as BMVO, but the compromise is its relative proximity to most of our members.

I contacted Phil De Rosa, who is the organizer of the York County Star Party (formerly Mason-Dixon Star Party) to chat with him about whether he thought the management at SSP would be amenable to DAS and other clubs to take advantage of the park for club dark sky observation sessions. He was able to meet with the new manager of SSP and it seems that Phil’s contact was in favor of extending park facilities to astronomy clubs. This local manager said that he has to run Phil’s request up to the boss. More to follow...

The second item that Phil and I discussed was the York County Star Party. This event was the evolution of the former Mason Dixon Star Party. Mason-Dixon’s home was at the Shreveport Airport, not far from Dillsburg PA. The airport was sold, Phil was successful in negotiating with SSP to host the current YCSP. As the CN article states, this year’s inaugural Star Party was an event to remember. Phil is beginning the legwork for YCSP 2020 and is getting the word out to astro clubs in the area. He is also looking at moving the date from August to September. I plan to canvas the group at our monthly meeting as to the interest level regarding both the YCSP and the availability of SSP. I am also interested in members’ feedback whether August or September would be a better choice.

I will keep DAS in the loop on developments at Susquehannock.

Report from Sidney Ocampo

Bellevue parkway Outreach

Oct. 2, 2019

Led by Greg Lee



Attendance was great! But the sky was not. It was cloudy most of the time except for the quick emergence of Alkaid, Mizar, and Alioth. Just enough for the guests to view them.

Observing Report

By: Fred De Lucia

“There is No Such Uncertainty as a Sure Thing”

The above quote of Robert Burns, national poet of Scotland, seemed apropos considering how promising observing forecasts have been. Some readers might recall my West Virginia excursions (see FOCUS Nov ‘12 p 10, Oct. ‘14 p 8 and Oct ‘16 p 4). If you can appreciate the excitement of observing on what is likely the darkest site on the East Coast then you’ll understand how disappointing it was to give up on such a trip. West Virginia in late September is always a dice throw when it comes to observing on the mountain top that is Spruce Knob at 4,864’ altitude. Experience from prior years’ trips has shown that despite the forecasts for lower lying surrounding areas “the Knob” can be completely at odds with weather websites. On one trip to the Knob it was balmy at 45°F but when coming down the mountain there was frost and it was 32°F. Another trip it was almost intolerably windy but the next 2 outings were calm with spectacular observing. Another excursion had 4" of unexpected snow upon waking in the morning. Spruce Knob itself seems to have a climate of its own. It can be clear or cloudy, calm or windy, dry or dewy, have very comfortable temps or be quite cold... and that’s just in late September. But when it’s GOOD, it’s TOTALLY AWESOME. Such as one trip when we had 4 straight nights of clear, pristine skies. Like an observing buddy of mine says, “If you wanna know, then you gotta go.”

Well, we didn’t go. West Virginia was canceled due to my usually intrepid traveling companions having little faith in the weather forecasts. So, I decided to take advantage of a developing high pressure system moving in to the more northerly Blue Mountains in Pennsylvania and it looked like a “sure thing” for Frank Colisimo’s Blue Mountain Vista Observatory (BMVO) field (for more information on the BMVO see the Dec. ‘18 FOCUS pp 7-10 for Bill Hanagan’s article *A Visit to Frank Colosimo’s Observatories*). Many DASers know that I often have at least one trip every dark window to the BMVO, but this September I had 2 trips, with the first extending into 2 nights. Generally, after observing I opt for the near 2 hour drive home, but sometimes I’ll catch a power nap in my car before disembarking. Camping on the field is permitted and the DVAA club has had several overnight star parties there. There are several hotels and motels within a short drive from the field. For this trip, I stayed in Pottsville at a Ramada Inn that’s under renovation.



Restaurants are pretty good in the area. Frank and I went to the 419 Café in Orwigsburg where we had a wonderful lunch of mushroom soup and ½ sandwiches that had more lunchmeat in them than what's usually found in 2 full-sized sandwiches elsewhere. The only problem with the 419 Café is that it closes at 2PM!!

Igor Peshenko and his Orion 8" astrograph/Atlas mount, John Homka with his recently finished DIY 24" f/3.0 Dob and Al Lamperti (see his article "A Full Deck of Kings" in the Nov. '19 Sky & Telescope) with his 22" f/4.2 UL Obsession joined me with my 18" f/4.0 StarStructure on the first night at the BMVO,



Wednesday, September 25. It was among the best nights I've had there. Clouds hugged the low northern horizon but weren't bothersome and my Unihedron Sky Quality Meter showed the zenith measured 6.1 Naked Eye Limiting Magnitude (NELM) by 10:30PM. The Summer Milky Way was still very apparent and the customary showpieces of the Messier and NGC catalogs showed very well in our eyepieces. I saw about a half-dozen or more meteors, some of which were quite bright and two left trails that lasted several seconds.

Two comets graced our eyepiece views, C/2018 W2 Africano and C/2018 N2 ASASSN. Africano was the brighter of the two solar system visitors but ASASSN was observed with galaxy NGC 777 in the same field of view. What a hoot it is to see such a transient pairing!

Because this 2 night session was as a result of the aborted West Virginia trip, naturally, I pulled up my observing list in Skytools3 Pro for Galaxy Trios and Galaxy Groups. The highlights were NGC 383, aka the Pisces Cloud. At 230-250 million light years distant I was able to pick out several galaxies in a 10mm Ethos eyepiece. Also, I saw the 5 galaxies in Stephan's Quintet, although it took some effort. My favorite galaxy group at this time of year is NGC 1275, the Perseus Radio Source in the large Perseus Galaxy Cluster. However, none of these views could be mistaken for the skies of West Virginia but nonetheless it was loads of fun using different eyepieces to absorb the various fields of view, changing magnifications to reveal discrete details and sharing observations through others' scopes.

The next night, Igor and Al didn't join us and John and I were expecting this "sure thing" to continue but we were plagued with dew that actually got so bad our primary mirrors dewed over. My mirror's dew-over was resolved in about 20 minutes after I rolled up the shroud on my 18" and John's 24" cleared in about 15 minutes after turning on his mirror box fan. Our secondaries remained clear. Despite the moist conditions we continued observing many deep sky objects until..., well, until we were done.

The following week as the dark window was ending the forecasts were once again inviting observers and imagers to the Blue Mountain Vista. The seeing conditions were expected to be poor but the transparency was supposed to be above average. Notably, a cold front was also moving in with low temps likely at near freezing.

On Friday October 4, in addition to Igor Peshenko and John Homka, Jack Goodwin joined us with his Tele Vue 101s refractor, along with Josh Wright, President of Chesmont with his 25" F/4 Obsession, Bob Jorgenson with his 20" f/4.5 Obsession, Don

Frampton who borrowed Jack's 14" f/6 Orion Intelliscope and Lionel Sandell with his 16" f/4.2 Teeter Telescope.



For this session temperatures steadily dropped as expected to near freezing and was a reminder that our Summer observing was officially over. Also, it had very poor seeing. Everything was swimming in wavy images over 300x. The best NELM reading was 5.9. That near quarter magnitude difference from the prior week was sorely missed and was probably due to high lying thin clouds that the weather satellites don't pick up. So we resolved ourselves to the usual eye candy at low to medium power. Jack's Tele Vue 101s held an engaging view of the Pleiades, M45, in a super wide field eyepiece. In my 18" M57, the Ring Nebula, was bright with its typical smoke ring appearance. M13, the Keystone Cluster and the globular cluster M92 both looked brilliant in my 13mm, 10mm and 8mm eyepieces at 162x, 210x and 263x, respectively. Otherwise, it was difficult to push any sort of higher power on objects that customarily held up well to high magnification. For example, the Blue Snowball, NGC 7662, was best at about 91x. Just for grins I pressed my 18" to 1137x, which with good seeing in the past easily revealed shell layering around the central star but it was an exercise in futility. There

wasn't even a fleeting few seconds of crispness to the view as often happens in even less than ideal conditions. Similarly, before closing down for the night at 3AM, I targeted the Eskimo Nebula, NGC 2392, a bright 8.6 magnitude favorite of many of us, and again, no joy pushing the power. What was seemingly a sure thing for an observing session resolved into uncertainty. But that's astronomy under the Northeast's Jet Stream, so I was content with the excellent observations of the previous week and the opportunity to spend time under an appreciably darker sky than what's available locally with good company.

Wishing clear, dark and steady skies to all,

Fred De Lucia



Plan "B" for a cloudy night

In Memoriam

Billie Westergard

October 7, 1939—October 4, 2019, Age 79

Survived by his loving wife, Sylvia



Billie was a strong and faithful friend personally and to amateur astronomy generally. He was one of our most senior DAS members and on the MCAO board of directors.

—Jim Barkley

Billie Westergard was extremely excited by and supported amateur astronomy as well as the field of theoretical astrophysics for decades. He was our club president in three separate terms in different decades and was always trying to help others get excited about astronomy. He did a lot of good for Mt. Cuba, the DAS, and astronomy in general. He will be greatly missed.

—Rob Lancaster

Billy certainly had a great deal of enthusiasm for astronomy. He will be missed.

—Scott Jackson

Obituary:

<http://wilmingtonnewsjournal.de.newsmemory.com/?publink=1f3811e63>

DAS presidency terms: 1983-86, 1989-91 and 2004-06.

OBSERVER'S CORNER

As a beginning astronomer, I recently came across this article in the Royal Astronomical Society of Canada's Astronomers Handbook 2019 and it made quite the impression on me. I thought I would pass it along so my astronomical colleagues, beginning and advanced, could enjoy the sights in Camelopardalis as much as I have.

This article is reprinted with the kind permission of the Royal Astronomical Society of Canada and the authors Chris Beckett and Randall Rosenfeld.

Enjoy.

Mark Jacobini

CAMELOPARDALIS

by Chris Beckett & Randall Rosenfeld

A "Lamplighter moment" is simply an occasion where, through careful observation of the mundane, one unexpectedly discovers something profound, something achieved by Lucian Kemble fairly regularly during his lifetime. — David M.F. Chapman

Camelopardalis...well if you want to see a black hole just take a look between Perseus and Polaris, or so goes the old joke because no stars exist here brighter than 4th magnitude. The region looks like a void from city cores. However, in this region, previously left for warnings of "There be Monsters," lies some of the best hunting grounds for the smallest binocular to the largest reflector. Just one catch, though, bright guidepost stars are non-existent, and there are no familiar fields from your Messier objects. Perhaps the gentle giraffe was meant to ease observers' trepidation, though Hevelius is said to have begrudgingly added Plancian's odd animal to the northern polar sky. The Greeks are responsible for the confusing name as they saw the creature we now know as a giraffe possessing features of both camels and leopards and this area of the sky has befuddled more than its share of observers ever since.

In 1980, "unattached" RASC member Lucien Kemble† swept up a colourful chain of about twenty stars using humble 7X35 binoculars he described as "...a beautiful cascade of faint stars tumbling from the northeast down to the open cluster NGC 1502." This Wide-Field Wonder, visible to the unaided eye as a faint glowing contrail, became known as Kemble's Cascade, now a popular asterism and a great starting point for locating nearby Finest NGC objects.

Located 1.4° south of NGC 1502's stellar "pool" of two dozen stars lies the planetary nebula NGC 1501, a granular ellipse whose ripples and bright, easily visible, central star give rise to the common name "Oyster Nebula." NGC 2403 is the brightest most northern galaxy not listed by Messier during his comet sweeps, an odd miss since it is now considered a right of passage for novice comet hunters to have a moment of excitement when they stumble upon it. Listed as a "Brightest Galaxy" in this Handbook, it is easily swept up in binoculars while modest telescopes reveal NGC 2404, a star-forming region, beneath a line of foreground stars. Moving north about 5°, we come upon the strange irregular dwarf galaxy, NGC 2366, where a large luminous HII region (Mrk 71) sits at the southern end just opposite another dwarf galaxy, NGC 2363. This pair make for a strange concentration appearing as an out-of-focus binary, and they join a bright foreground star for a dramatic scene.

Next head into far northern Camelopardalis to NGC 2655. This slightly elliptical galaxy has a bright, round nucleus when viewed through moderately sized telescopes. While near the pole be sure to observe the colourful double star 32 Cam. On the way to the next galaxy, check out the carbon stars S Cam, a pulsating variable star; RU CAM, a Cepheid Variable; and ST Cam. These burning embers are easy to pick up and they display brilliant orange-red colouring. Near Cassiopeia is Challenge Object galaxy IC 342, a challenging low surface brightness allows visibility in smaller instruments using low power, while large telescopes may over-magnify this spiral out of sight. Also in these borderlands is Stock 23, a coarse rectangular grouping of 25 stars, easily visible without any optical aid. Binoculars frame this cluster among the many nearby bright nebulae and clusters of the region.

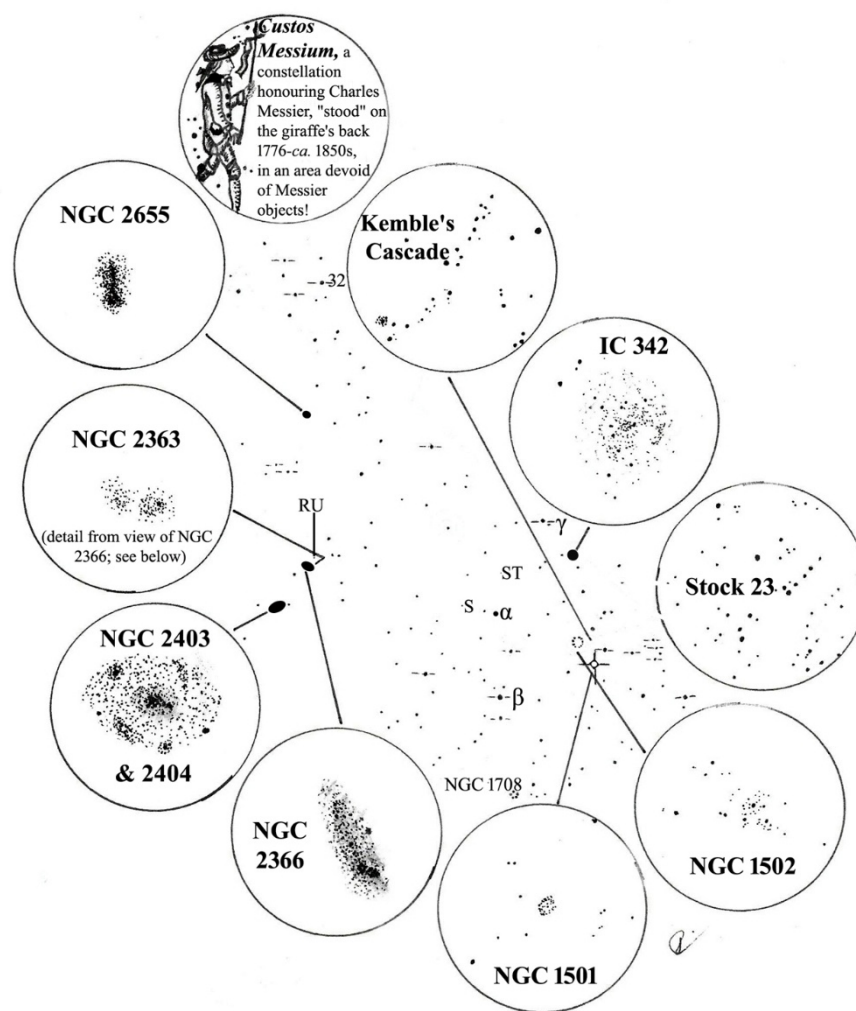
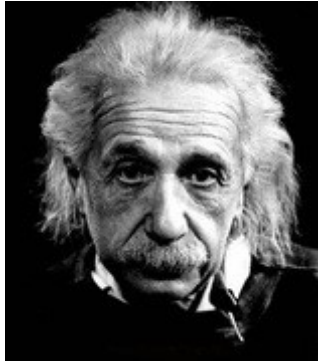


Diagram by Randall Rosenfeld

Barnard 8, 9, 11, 12, and 13 form “a large irregular lane” over 6° in length as described by the great observer. Barnard was the first to systematically catalogue dark nebulae, he was an RASC Honorary Member c. 1900, and he compared this lane to his “E” in Aquila. While easily seen with any binocular from reasonably dark locations, there are no bright nebulae or star fields to contrast this “void” in space. A few degrees east brings LeDrew 4 (Alessi 2); discovered by Ottawa RASC binocular observer Glenn LeDrew, it appears as an umbrella through binoculars. A few degrees southeast of LeDrew 4 is NGC 1708, categorized as a “non-existent NGC” until Patrick Brennan of Regina re-acquired it in 1976. Writes Brennan, “it is triangular in shape, elongated north-south, $20' \times 15'$...It contains about 10 stars of magnitudes 10 and 11, with a score of fainter ones.” It is no surprise that an entire star cluster could be lost for almost 150 years in Camelopardalis, but maybe, if you crane your neck and aim your instrument at this blank spot in space, you can find something new, or at least fill an evening pondering the question, “why is there a giraffe in the northern sky?”

DAS Loaner Equipment



“Be a loner. That gives you time to wonder, to search for the truth. Have holy curiosity. Make your life worth living.”

The DAS has several telescopes that are designated for loan to members. Our advice to new members is to take any of these telescopes out on loan so you can learn the advantages and disadvantages of the various designs.

- ☐ 80mm Celestron Refractor with a NexStar GOTO mount. (On loan from Bill McKibben)
- ☐ Meade ETX 90mm Special Edition
- ☐ Bushnell Voyager 4" tabletop scope (AstroScan clone)
- ☐ Three Dobsonian scopes: two with 6" aperture, one with 8" aperture. This style scope is very easy for beginners.
- ☐ Meade 8" LX-10 Telescope: This 8" Meade LX-10 Schmidt Cassegrain Telescope (SCT) is a good loaner if you have any thoughts about buying an SCT telescope on a GoTo fork mount.

Procedure for DAS Members to Sign Out Loaner Equipment

1. **Inform:** Please inform DAS Observatory Chair via e-mail -- this is currently how all loaner equipment is being logged/tracked. (email below)

2. Borrower email to include:

- a. Your name and contact information (cell #, email, home number, etc.)
- b. Date equipment borrowed
- c. Description of all equipment being borrowed
- d. Estimated return date for each component borrowed
- e. List any damaged/missing components (if applicable)

3. **Damage:** If the equipment is damaged while you are borrowing the equipment, please notify the DAS Observatory Chair in a timely manner.

4. **A sign out log** will be posted in the near term to compliment the email notification. **NOTE:** Currently DAS Loaner equipment is **only available for loan to current DAS members**. (Which is a great excuse to join DAS)

Thank you,
Chris Horrocks
DAS Observatory Chair

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. We get together 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 have made several Newtonian telescope mirrors from scratch and completed some mirrors that members brought in as works in progress, including one that was started in the mid-1960's! We've also made new telescope tubes, made secondary mirror holders, tested numerous telescope objectives, made wire spiders for Newtonian secondaries, and made many solar filters for telescopes and binoculars. We also completed the refiguring of the DAS 17.5" Newtonian mirror used in the Big Dob currently housed in the Sawin Observatory.

If you're interested in telescope making, feel free to email me and let me know what you're interested in doing at hanaganw@verizon.net and include your name, address, and phone number. I'm always glad to provide some guidance and information to other telescope makers.



Images taken before and after adjustment of the Hubble Space Telescope *using methods fully endorsed by the ATM SIG.*

How to Join the DAS Groups.io Group

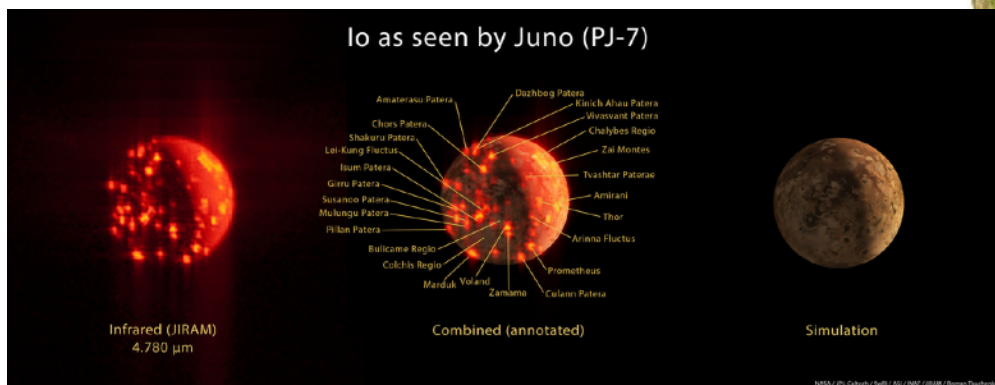
DAS FORUM / E-MAIL SITE ON GROUPS.IO

This is an e-mail service, online forum, and information sharing service for use by DAS members and our astronomy enthusiast friends. To Subscribe to the service, just send an email to: DAS+subscribe <at> groups.io. Then we will compare your name/ email to our lists to make sure that we know you, and if so, we will approve your subscription. If you are not currently a member of the DAS, we strongly encourage you to join.

That is all that you need to do to get into the system. You don't even need to setup an account. But if you want to have more control over how you receive messages from the group or if you want to use the more advanced features, then head over to the website <https://groups.io/login> after you are approved for the DAS Group and you can log in to make any changes you like.

For more information about our group click this link:

<https://groups.io/g/DAS>



**Io, the highly volcanic innermost moon of Jupiter, after which the .io groups were named (I presume)
—RGS**

New Members Form

Please make checks payable to DAS, print out the following form and mail to:

Robert Trebilcock, DAS Treasurer, 3823 Rotherfield Lane, Chadds Ford, PA 19317

DAS Membership costs \$30 per year, which renews November 1st. We pro-rate membership based on when you join, as follows:

Month Joined	Cost	Renewal Due
Jan-Feb	\$30	This November
March-May	\$20	This November
June-Aug	\$10	This November
Sept-Dec.	\$30	Next November

NEW MEMBERSHIP FORM

Item	Cost	Sub-total
Membership	\$30/20/1	
Astronomy Magazine	\$34	
	total:	



Name _____
Email Address _____
Street Address _____
Phone Number _____
City _____ State _____
Zip _____
How did you hear about
DAS? _____

For questions, contact Robert Trebilcock, DAS Treasurer at (610) 558-1637 (leave message) or by email New Members

Please see the [How to Join page](#) on our website for methods to become a dues-paying member. If you have any questions call any of the member representatives listed.

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!—Rob L.

to Trebilcock@aol.com

DAS Contacts

Please call or email us with any questions or for more information!

Officers:

President: Rob Lancaster, rlancaste AT gmail DOT com

Vice-President: Jeff Lawrence, (302) 668-8277, jeff AT delastro DOT org

Secretary: Bill McKibben, billmck21921 AT gmail DOT com

Treasurer: Bob Trebilcock, trebilcock AT aol DOT com

Board Members at Large:

Bill Hanagan, (302) 239-0949, hanaganw AT verizon DOT net

Tom Harding, hardintw AT aol DOT com

Dave Groski, groski AT udel DOT edu

Standing Committee Chairs:

Observatory: Chris Horrocks

Education: Ted Trevorow, (302) 593-7949, edt750 AT verizon DOT com

Library: Maria Lavallo and Sue Bebon

Observing: Greg Lee, (302)252-7806, greglee288 AT gmail DOT com

Publications: Rick Spencer, rgspencer AT ymail DOT com

Other Positions:

Amateur Telescope Making Special Interest Group: Bill Hanagan, hanaganw AT verizon DOT net

Astronomical League Coordinator: K Lynn King, klynnking AT verizon DOT net

Astro-Photography Special Interest Group (AP-SIG): Bill Hanagan, hanaganw AT verizon DOT net

Awards Chair: Amy Hornberger, aehornberger AT gmail DOT com

DAS Book Club Leader: Amy Hornberger, aehornberger AT gmail DOT com

Elections Chair: Sidney Ocampo, gegocampo AT yahoo DOT com

Programs Chair: Jeff Lawrence, jeff AT delastro DOT org

Webmaster: Rob Lancaster, rlancaste AT gmail DOT com

