

# CONSTELLATION

The Official Publication of the Bucks-Mont Astronomical Association, Inc.

VOLUME 20, Issue No. 3. July/August/September 2005 Chris Sommers, Interim Editor

© BMAA, Inc. 2005



## Note from the Editor

Well, it has been a while, but the Constellation is back after an 18 month absence. Pertaining to BMAA, some things have changed, and some things have remained the same. We are still one of the most active amateur groups in PA that promotes interest in astronomy through our Star Watches. We have had a couple of absolutely awesome Stella-Della Valleys, one of the oldest annual Star Parties in the northeast. During the same period we have gone through 2 Presidents, 1 Vice President, 2 Secretaries, and an Editor for the Constellation. But somehow we just keep on chugging along through our light-polluted Bucks and Montgomery County skies. In other words, we, the group of nerds and geeks of Bucks and Montgomery County that constitute BMAA, are indomitable and unconquerable. The bottom line is that, for a small amateur astronomy club, we kick butt, and will keep on doing so in the future. In this issue we have articles written by a couple of the newer members. First in this issue is an article by Dwight Dulsky, our new Vice President, about his shiny new Coronado Personal Solar Telescope (PST). These popular PSTs have brought H $\alpha$  solar observing to the masses. Second is an article by the Interim Editor, yours truly, that is a review of the Vixen 80mm apochromatic refractor and Televue Radian eyepieces.

We will be publishing the Constellation on a quarterly basis in the future, and it has been resurrected as Volume 20. Issue No. 1 will cover January/February/March, Issue No. 2 April/May/June, Issue No. 3 July/August/September, and Issue No. 4 October/November/December. In this issue the July/August/September 2005 General and Executive Meeting Minutes are included. Meeting minutes for previous months would make the issue inappropriately long and unwieldy. The Star Watch and Star Party schedule for the next three months are also included. We encourage you new members, and even you old ones, to submit articles and reviews for publication. You know where to find me on the first Wednesday of each month if you want to submit an article. Let's keep the Constellation going.

Clear Skies,  
Chris Sommers, Interim Editor

\*\*\*\*\*

## BMAA Gophers

Position	Name
President	Bernie Kosher
Vice President	Dwight Dulsky
Treasurer	Ed Radomski
Secretary	Herb Borteck
Star Watch Coordinator	George Reagan
Constellation Interim Editor	Chris Sommers
Webmaster	Jim Moyer

\*\*\*\*\*

For More Information About BMAA Go to [www.bma2.org](http://www.bma2.org).

\*\*\*\*\*

## Solar Viewing with the Coronado PST By Dwight Dulsky, BMAA

I am a terrible failure at one of the main prerequisites of astronomy - on most nights it's tough for me to stay awake much past 10:00 PM. I'll probably never discover any comets or even see that great occultation that happens somewhere at 3:23 in the morning. No, most nights these old eyes tire out even before the Eleven O'clock news. I guess you would say I'm a "morning person", not 12:03 AM mind you, more like an after breakfast kind of guy. Unfortunately, the celestial targets after breakfast get kind of limited, but they're easy to find!



One of the first sights I saw through my 8" reflector was the Christmas day partial eclipse back in 2000. That was pretty impressive using just a glass solar filter. Some dark sunspots only added to this interesting event. But, you don't get much more than that by just looking at the white light of the sun. *Note to new astronomers: Never look at the sun through a telescope or binoculars without the proper solar filters. Consult a dealer for what is an appropriate safe filter for your equipment.*

I have always been fascinated by the great images in the astronomy magazines and on the Internet. The color, detail and contrasts are certainly impressive. Nothing has impressed me more than those great pictures of solar flares and prominences. So large are the prominences, that the Earth would be swallowed easily in one of those fiery streams of partially-ionized gas. Yet this constantly occurring solar dance remains hidden from us mere mortals. That is until Hydrogen Alpha filters hit the astronomy scene.

The prominences that take place in the chromosphere are best viewed with a Hydrogen-Alpha filter at the 656.3 nm wavelength. These filters reject most of the white light, only letting a narrow sliver of the red end of the electromagnetic spectrum through. However, it is within that narrow slice of the spectrum that allows us to see all this great action taking place just above our sun's surface. The Coronado system utilizes an ingenious filtering device called an etalon. I will not attempt to go into detail about the engineering of these filters here, but if you want a little more info, check out the web sites I listed at the end of this article. The etalon, paired with another blocking filter creates a bandpass of  $< 1.0 \text{ \AA}$ . ( $\text{\AA}$ =angstrom) The Earth & Space Department at the State University of New York states that "The Angstrom is the natural unit for atomic physics, as the ground-state diameter of the hydrogen atom is about  $1 \text{ \AA}$ . Visible light has wavelengths between about 4000 and 7000  $\text{\AA}$ ." Essentially this solar filter is only letting through wavelengths of light similar to the width of excited hydrogen atoms. With virtually all of the ultraviolet and visible light spectrums removed, you are left with a very nice high contrast image of our sun's fuel source - hydrogen.

Until recently, the cost of producing reliable, safe, effective Hydrogen Alpha filters was very high. Etalon making is a very precise bit of engineering requiring not much room for error. With the exception of the Coronado Personal Solar Telescope (PST), most  $H\alpha$  solar filters and telescopes were and still are extremely expensive. The Coronado line above the PST buys you more contrast and detail of the solar disk. The PST however does a credible job for its base \$499.00 price tag.

I made the decision to buy the PST last spring. Bob Black at Skies Unlimited walked me through the options available and set up routine of the PST. The package is so simple to use, that the instruction manual is just a one page tri-fold flyer. It's basically "point and view". I opted only for the factory hard case. You can get a small MALTA tabletop mount which can store in the hard case, but I decided to try it on a very sturdy video tripod I had lying around the house. It was very simple to install using the camera mount screw on my tripod.

The PST is crafted from machined aluminum, and has a sturdy well made feel. The aperture is 40mm, with a 400mm focal length creating an f/10 focal ratio. A standard 12mm Kellner eyepiece is included. Coronado recommends their CEMAX series as optional eyepieces. These eyepieces are specially coated and baffled for optimum solar viewing. Eyepieces are available in 25mm, 18mm, 12mm, and a 2X Barlow. These eyepieces have a 20mm eye relief, and an apparent FOV of 52 degrees.

Another unique feature of the PST is the built-in "Sol-Ranger" alignment device. Anyone who has ever viewed the sun in filtered white light or  $h\alpha$  knows the difficulty of finding the sun when you can't really look in its direction. The classic method is simply guessing with the shadow that your telescope makes on the ground. When the shadow of your optical tube is smallest, you are close to the right spot. This would be hard to do with the PST due to its already small

size. The PST was designed with a small piece of translucent glass on the top of the scope that enables you to find the sun by centering its image on the Sol-Ranger's glass. This is a little easier said than done. You would think that when the sun's image appears dead center in the glass that it would also be centered in the eyepiece - not usually. But, with some slight panning or tilting the sun will pop into view as a bright red disk. A small focusing knob is located on the bottom of the PST will bring the edge of the disk into sharp focus.

The next adjustment to make is a slight fine tuning of the filter. This adjustment will bring the action in the chromosphere into view. An adjustment ring is provided at the base of the optical tube. Rotating this ring a little bit one way or the other does the trick. Although the instructions say that this adjustment only needs to be done once, I find that it needs to be done at every use because invariably you move this ring when packing and unpacking the scope from its foam lined box. But, it really is absolutely no problem to make this adjustment in seconds. The difference in the adjustment is like night and day or should I say prominences or no prominences.

With the 12mm supplied eyepiece the prominences are not the breathtaking large images one sees in the ads. But, they are "real" and fascinating to watch right before your eyes. The image is sharp and offers good contrast. Movement of the prominences is imperceptively slow. If you set up to watch for a few hours you will notice the prominences changing. I have found that most of my other eyepieces work just fine in the PST. However, my 2X Barlow (Orion) does not work in the system. Someday I may purchase the CEMAX series, but for now I'm happy using what I have on hand. Adding rubber eyeguards to my eyepieces when observing the sun greatly enhances the viewing comfort and helps block out stray sunlight from entering the top of the eyepiece. Coronado also offers an observers hat with long front brim and cloth backdrape. It's not often that astronomers worry about a sunburned neck while out observing! I am considering adding a circular sun "shield" to fit over the front of the scope to aid in blocking light to the eyepiece area. My idea is to create a circular disk about 16" in diameter, cut out a center hole for the barrel of the scope. Making this out of foam core should be easy. My only slight fear is that it may act like a "sail" in the breeze and disturb the image. Along those same lines, the PST is rather small and compact on its own. Breezes seem to affect it very little. I have since noticed an aftermarket sunshield device from Astro Engineering called the SolarMate Observing Shade that fits between your tripod and PST. The sheet metal shield also includes holes for three eyepieces.

Another feature that can be added on to the PST is the ability to "double stack" an additional SolarMax 40 filter. By doing so you can narrow the band pass even farther to around  $<0.6\text{Angstrom}$ . The main benefit of this will be an increase in surface detail. But, the cost of this addition will be more than you paid for your PST! Double stacking isn't quite as easy as just screwing on another filter. A dealer or Coronado will need to match your scope's etalon with the etalon of the SolarMax 40 for optimum efficiency.

I have found that most people do need a little time to "find" the image when they first look into the PST. But, they are quickly rewarded with a sight of the sun that you're not going to find anywhere else for the money. Lightweight, very portable and easy to set up makes the PST a nice addition to your telescope collection. Better yet, I don't have to stay up till the wee hours of the morning to see something unusual.

Coronado Web Site

<http://www.coronadofilters.com/index.shtml>

Etalons (what's an etalon?)

<http://www.tecoptics.com/etalons/index.htm>

Northern Virginia Astronomy Club

(great introduction to solar viewing and principles)

<http://www.novac.com/resources/solar/>

Skies Unlimited (local Coronado dealer)

<http://www.skiesunlimited.net/>

\*\*\*\*\*

As of September 2005, BMAA is an affiliate of the Meade 4M Community  
[www.meade4M.com](http://www.meade4M.com)



\*\*\*\*\*

## BMAA Last Quarter Schedule of Events

### October

5 Wed 8pm BMAA General Meeting, Peace Valley Nature Center, Doylestown  
7 Fri 7:30pm StarWatch, Tamanend Park, Southampton  
12 Wed 7:30pm StarWatch, Cedar Hill Park, Maple Glen

### November

2 Wed 8pm BMAA General Meeting, Peace Valley Nature Center, Doylestown  
4 Fri 7:30pm StarWatch, Upper Gwynedd Wildlife Preserve, Upper Gwynedd  
9 Wed 7:30pm StarWatch, Silver Lake Park, Bristol  
25 Fri 7:30pm StarWatch, Willard Markey Centennial Park, Perkasi

### December

7 Wed 8pm BMAA Holiday Meeting, Peace Valley Nature Center,

\*\*\*\*\*

## How and Why I Purchased a Vixen 80mm Fluorite Apochromatic Refractor and Televue Radian Eyepieces By Chris Sommers, BMAA

There are a number of articles, too many to count, that recommend spending your money on a telescope that will actually be used, as opposed to sitting in a corner. At the time I made this purchase my primary telescope was a Meade LXD55 SC8, which has served me well. It is, however, relatively bulky and difficult to carry through the house to the deck. This is a serious issue for me because of a bad back and neck. When my back is sore the last thing I want to do is lug the thing around. The other issue was my eyepieces, which were the Meade Plossls set that were purchased as part of a special when I got the SC8. Not bad eyepieces for the money, and a good starter set, but I wear glasses and was in desperate need of better eye relief. So I embarked on a year long journey to procure a good quality small telescope and eyepieces that could be used for a lifetime of observing pleasure.

Since joining BMAA I have had the opportunity to look through and evaluate many telescopes and eyepieces, and have fallen in lust with apochromatic refractors. An 80mm refractor would be lighter, less bulky, and would work well on my LXD55 mount. But which one? This is where the *research* came in. Hitting the vendor web pages to look at the available equipment and prices. *Extensive* research on the Cloudy Nights web page ([www.cloudynights.com](http://www.cloudynights.com)), which contains a number of well-written reviews of small apochromatic refractors (which included a review of a Vixen 80mm fluorite with Televue Radian eyepieces). Based on the online reviews I eliminated the bargain "manufacturer proclaimed" apochromatic refractors made in China in the \$500 to \$1000 range. There are a lot of them available for resale on internet sites, and in my opinion this is a sign of buyer's remorse. I have also run into a couple of astronomers who bought them and then sold them quickly.

There wasn't any hurry, so I waited for almost a year, like Shelob in its lair, with my pennies saved, ready to pounce. And pounce I did. In my regular perusal of the vendor web pages I found a Vixen 80mm fluorite apochromat on clearance at Skies Unlimited. This was fortuitous as I like the first-rate advice and service that I get from Bob and Gary, the owners (I have no financial interest in, or other arrangements with, Skies Unlimited). So, after a few emails and phone calls, I made the drive down to the shop for a look at the scope.

The scope was a “clearance” special, as Vixen was changing its models. Bob Black (one of the owners) and I spent time discussing what could and could not be seen with an 80mm refractor, appropriate use of eyepieces, limitations on visual magnitude and magnification, potential use for planetary versus stellar observations, etc. The advice was consistent with the reviews I had read on Cloudy Nights. The scope was a 640mm f8. It weighed in at 5 lbs and came with the rings and an LXD55 compatible dovetail (I took my mount to make sure, something you can do at a local shop), a 2” focuser, flip mirror diagonal for 1.25 inch eyepieces, and a red-dot finder. The optical tube was well baffled. The focuser was firm with no backlash. The red-dot finder used a ball clamp for adjustment that requires a little dexterity to use. The dew shield was removable. The scope was small enough to be “travel” portable (30” long assembled, 19” long disassembled).

The second part of the purchase was the long eye relief eyepieces. Again, before laying out the cash there was *extensive review* of online articles. I also had the opportunity to *evaluate various eyepieces* at BMAA star watches and star parties. Again, I immediately eliminated the lower priced “bargain” long eye relief eyepieces that have flooded the market recently. I had the opportunity to look through several variants of them and was not personally satisfied with the product. While at BMAA star watches there was an opportunity to observe with Televue Radian eyepieces, which all have 20mm of eye relief, and are renowned to their optical quality. Televue was also running one of their rare eyepiece sales, and I took advantage of that by purchasing a set of the Radians.

The Saturday I made the purchase had clouds in the forecast for the evening, but they held off for a couple of hours. I set the scope on the deck to cool down for 30 minutes before starting to observe (late March). The LXD55 mount was much more tolerant of the 5 lb. scope than the heavier SC8 (See Figure). It was a hazy night with mag 3-4 skies. I was



able to split Rigel very easily and through I am NOT an expert with refractors the “star test” looked the way it does in reviews. There was no “purple haze” when I viewed Sirius. The color was pretty good when looking at Betelgeuse and Polaris. The moon was a little whiter than with SC8. The trapezium in Orion looked fabulous with its pinpoint stars, with a whisp of the nebula still visible even under the hazy light-polluted skies. The quality of the images took a noticeable turn for the worse when I used the Meade plossls, which goes to show that good scope optics must be combined with good eyepieces to get those “quality” images which apochromatic refractors are known for.

I took the scope to the BMAA April General Meeting at the Peace Valley Nature Center in Doylestown for “show and tell”. The “experts” would give it a test drive. The older than dirt guys were pretty happy with the optics. One thing they did observe, that I had not, was the backmost baffle had a *tiny* amount of aluminum showing (easily fixed). We had mag 4-5 skies with light haze for the viewing. No moon. “Steady” seeing. The day had been very warm for April, the temperature was in the low 60’s that night. Jupiter was first on the list. At 35x (18mm Radian) all four moons were crisp, as was the planet. The equatorial bands were clean sharp lines on the disk of the planet. With the 6mm Radian the planet was clean and crisp at 107x, with the equatorial bands and the polar regions displaying light gray/blue coloration. Again, no purple haze. The grain and striations of the polar regions and equatorial bands were crisp, and were brought out even more with the use of a light blue filter. The older than dirt guys nodded and grunted their approval as they took their turns observing, and the image held very nicely with the 4mm Radian (160x), with more striations and festoons in the equatorial and temperate bands becoming visible. The Great Red Spot was not visible that night. I then turned the scope to Saturn. The A and B rings, and the Cassini Division were clearly visible at 64x and 107x. The shadow on the rings from the planet was sharp and clearly visible. Very nice images. The planet was its typical yellow with a slightly darker polar region, and the equatorial bands clearly visible and defined. No noticeable chromatic aberration. The image held up well at 160x. I eventually purchased a 3mm Radian and can push the scope to 213x without distortion of the image on steady nights.

- Pro’s:
- Absolutely wonderful optics, a good combination with the Radians.
  - Good action on the focuser, no backlash.
  - Flip mirror for astrophotography.
  - Superb for both stellar and planetary viewing.
  - Light weight and portable.
  - OTA and eyepieces on sale, considerable savings.

Cons: Still an 80mm refractor. \
Don't expect breathtaking views of nebulas and galaxies.
Very expensive OTA, if the deal hadn't been right.
2" diagonal extra, if desired.

Conclusions: The combination of the Vixen 80mm Fluorite Apochromatic Refractor, the Meade LXD55 mount, and the Televue Radian eyepieces are now the equipment I use about 90 percent of the time. The scope should give me a lifetime of observing pleasure. There are a few reasons why everything worked out as well as it did. First, I *identified what type of scope* I really needed. Second, I conducted *extensive background research* via the internet. Third, I *talked to other astronomers*, and "*test drove*" their equipment. Fourth, I talked to a *reputable vendor* at length about the prospective purchase. Lastly, I was *patient*, saved my pennies over the course of a year, and purchased the telescope and eyepieces that I wanted on sale. I hope the approach will be useful to other novices who are considering buying that shiny new telescope.

For quality reviews of telescopes, eyepieces, mounts, and other equipment go to [www.cloudynights.com](http://www.cloudynights.com).

\*\*\*\*\*

## Meeting Minutes

**July 2005 General Meeting Minutes**  
Peace Valley Nature Center, Doylestown PA  
06 July, 2005

Vice President George Reagan called the meeting to order at 8:10 pm.  
Officers Present: George Reagan, Vice President; Chris Sommers, Secretary.  
Attendance: 12 members and visitors.

**Treasurer's Report:** A total of \$7,529.68 in BMAA accounts.

**Secretary's Report:** Chris Sommers read the minutes, for the June Executive Meeting.

**Star Watches and Parties:** Less than 50%.

**August General Meeting:** Members night. Bring your junk.

**Presentation:** Bernie Kosher gave a talk on the phases of Mercury and Venus.

The meeting was adjourned at 9 pm.

Respectfully submitted,  
Chris Sommers, Secretary

**July 2005 Executive Meeting Minutes**  
Peace Valley Nature Center, Doylestown PA  
20 July, 2005

No minutes available. Secretary did not attend.

**August 2005 General Meeting Minutes**  
Peace Valley Nature Center, Doylestown PA  
03 August, 2005

Vice-President George Reagan called the meeting to order at 8:15 pm.  
Officers Present: George Reagan, Vice President; Ed Radomski, Treasurer; Chris Sommers, Secretary.  
Attendance: 18 members and visitors.

**Treasurer's Report:** Ed Radomski reported there was \$4,783.86 in the Observatory Accounts and \$2,875 in the Club Accounts for a total of \$7,659.50.

**Secretary's Report:** No report for July Executive Meeting. Secretary did not attend.

**Star Watches and Parties:** August Schedule on the website. Reminder of the Ches-Mont StarFest on August 6<sup>th</sup>. The Bucks County Horse Park would be reserved on August 12<sup>th</sup> for the Perseid Meteor Shower. The club was 7/18 for Star Watches for the year.

**SDV:** Dwight Dulsky reported the mailers went out. Emails also started. Roger Gordon was added to the speaker list. Volunteer list started by George Reagan, would be given to Bob Post. The club is in good shape, finished many tasks on time. However, vendor donation and attendees not updated.

**Presentation:** Bernie Kosher gave a presentation on how binoculars work and why.

The meeting was adjourned at 9:18 pm.

Respectfully submitted,  
Chris Sommers, Secretary

**August 2005 Executive Meeting Minutes**  
Peace Valley Nature Center, Doylestown PA  
17 August, 2005

Vice-President George Reagan called the meeting to order at 8:05 pm.  
Officers Present: George Reagan, Vice President; Ed Radomski, Treasurer; Chris Sommers, Secretary.  
Attendance: Dwight Dulsky

**Treasurer's Report:** Ed Radomski reported there was \$4,783.86 in the Observatory Accounts and \$3,540.64 in the Club Accounts for a total of \$8,324.50.

**Resignation of the President:** President Eric Esworthy resigned the presidency effective September 1<sup>st</sup>, 2005. He is moving to the Pittsburgh area. Good luck Eric. We'll see you at Cherry Springs. Arrangements need to be made to pick up the club 8" SCT and also the club 14" scope.

**SDV:** Ed Radomski reported registrations received included 17 adults, 4 children, 19 pizza dinners, and 3 for the Texas Bldg. for a total of \$725.00. Roger Gordon was confirmed as a third speaker for SDV. The officers decided to offer astronomy videos (DVDs) for public viewing on Saturday. Herb Borteck would be contacted to see if his Astronomy DVD set from the "Learning Center?" was available. Other issues included tickets for the raffle, name tags. There was no update on vendors and prizes as Eric Esworthy was not present. Chris Sommers took the list of last years vendors and would contact them by email.

**The Constellation:** According to the responsibilities of the Club Officers it is the responsibility of the Secretary to ensure the Constellation is published. If an issue is not distributed before SDV the club Secretary will take over publication responsibilities from the Editor.

The meeting was adjourned at 8:50 pm.

Respectfully submitted,  
Chris Sommers, Secretary

**September 2005 General Meeting Minutes**  
Peace Valley Nature Center, Doylestown PA  
07 September, 2005

Vice-President George Reagan called the meeting to order at 8:10 pm.

Officers Present: George Reagan, Vice President; Ed Radomski, Treasurer; Chris Sommers, Secretary.

Attendance: 21 Members and guests.

**Treasurer's Report:** Ed Radomski reported there was \$4,784.05 in the Observatory Accounts and \$5,012.14 in the Club Accounts for a total of \$9,796.19.

**Secretary's Report:** Chris Sommers read the minutes from the August Executive Committee Meeting, which were approved by those attending.

**Star Watches:** George Reagan reported the club was 10 of 23 for Star Watches to date in 2005. A special Star Watch was scheduled for the 10<sup>th</sup> in Hulmeville, which includes free food. A message will be sent out on the BMAA Yahoo Groups to finalize attendees.

**SDV:** Dwight Dulsky reported that virtually all preparations were made. The volunteer list was finalized. Vendors attending would include Skies Unlimited, Questar, and Owl Services. All speaker including Karl Krasley, Roger Gordon, and Adam Scribner were confirmed. Ed Radomski reported there were 67 registrants to date. Dwight Dulsky suggested showing presentations on DVD Friday night. Chris Sommers reported he was working with Bob Black from Skies Unlimited to obtain a telescope for a grand prize from Meade. Chris Sommers reported that the Constellation Editor promised to have an issue available for SDV. Members decided to sell off excess BMAA inventory at the SDV Swap Meet.

**Observing Site:** Ed Radomski brought up the subject of an observing site where BMAA members would not need prior approval or be harassed by Park Rangers.

**Elections:** Bernie Kosher volunteered to serve as the nominating committee for BMAA elections in October or November.

The meeting was adjourned at 8:50 pm.

Respectfully submitted,  
Chris Sommers, Secretary

**September 2005 Executive Meeting Minutes**  
Peace Valley Nature Center, Doylestown PA  
21 September, 2005

Executive meeting was cancelled. No meeting was held.

---

The *CONSTELLATION* is the official publication of the Bucks-Mont Astronomical Association, Inc., a 501(c)3 non-profit organization incorporated in the Commonwealth of Pennsylvania and exists for the exchange of ideas, information, and publicity among the BMAA membership, as well as the amateur astronomy community at large. The views expressed are not necessarily those of BMAA, but are those of contributors and are edited to fit within the format and confines of the publication. The contents this publication, and its format (published hard copy or electronic) are copyright of ©2005 BMAA, Inc., and may not be distributed without express written consent of BMAA, Inc.