

Rappahannock Astronomy Club

Minutes, May 21, 2014, Meeting

In attendance:

- Terry Barker
- Dawn Bateman
- Bart & Linda Billard
- Don Clark
- Joe Fordham
- Ron Henke
- Glenn Holliday
- Scott Lansdale
- Brian Sirnack
- John Ulrich
- Keith Wimmer

Acting Vice President Glen Holliday called the meeting to order shortly after introductions at 7 p.m. Eleven members and a visitor were present.

Program

Myron Wasiuta presented a program on star testing. He said his interest in astronomy started by age 10 when he witnessed a bolide in the sky over Pennsylvania. Before looking up to see the trail in the sky, he saw a shadow play on the ground as the shadows cast by trees moved about. In high school, he saw mention of the event in an astronomy magazine story on meteors.

Myron's first serious telescope was an RV-6 Dynascope. After using it for about a year, finding all the Messier objects and moving on to objects from the New General Catalog (NGC objects), he finally started becoming aware of optical limitations. Things got blurry at higher powers. Myron said he then began developing an interest in the optics of telescopes and reading up on the subject. He eventually learned about subtle details of getting quality images that still require a human touch to finish figuring the optics. Myron recommended learning to recognize quality optics by comparing telescopes at star parties or by learning to judge your own telescope.

The first step is learning to judge seeing, the turbulence of the atmosphere that degrades images regardless of the telescope quality. Myron cautioned us that we should also become aware of local seeing effects that we can avoid or control to get better images. These include effects of viewing out a window (or through one), as well as over rooftops or asphalt retaining heat of the day. Any nearby source of temperature contrasts can cause problems. Even a telescope that has not had time (at least 20 minutes) to come to temperature equilibrium with the air can degrade images. Seeing effects of the rest of the atmosphere are generally beyond our control, but he said summer is generally better than winter, especially about 2 days after a storm.

The next thing to learn is how to make sure your telescope is collimated. Myron said collimation is usually not necessary with refractors, although some of the best have provision for adjusting collimation. Reflectors regularly require collimation, and Cassegrains often require it, too. The latter can be tricky to learn which adjustment works which way. Star testing is a good way to check if collimation is needed.

Myron described the basics of star testing. He said to use a relatively high power, about 150 to 200, and to choose a bright star high in the sky to minimize seeing effects. You look at the star out of focus in both directions (focusing in toward the telescope and out away from it). You look for a disk with a dark hole in the center (no hole for refractors: it is the shadow of the secondary for reflectors and Cassegrains). It should have concentric interference rings. Astigmatism appears as an oval shape, longer in one direction inside focus and in the perpendicular direction out of focus. He said you need to see what is causing the astigmatism: if it is your eyes, you will see the direction change when you rotate your head; if it is the eyepiece, you can see it change direction when you rotate the eyepiece.

Myron told us things to look for. The out-of-focus images should be round. The outermost ring should show the same brightness both inside focus and outside focus. It should also show the same sharpness. The rings inside the outermost ring should show uniform brightness, both inside and outside of focus. The in-focus image should not show a trefoil pattern, which indicates pinched optics. He said it is the result of tightening the mirror cell too much after collimating, which is a no-no. It should be just barely tightened.

An ideal in-focus image of a refractor (or other system without a central obstruction), the Airy pattern, should look like a central disk with a single faint diffraction ring around it. A brighter ring or more than one ring visible indicates aberrations are causing less than the ideal 83 percent of the starlight to be included in the central spot and is a sign that sharpness and contrast of images will be poorer.

Myron showed us examples of star test images for various problems with optics, including a “turned edge” and spherical aberration. During the talk, someone asked whether Myron had ever used an artificial star for star testing. He said he had not done it himself, but the book he based his talk on, Harold Richard Suiter’s *Star Testing Astronomical Telescopes*, discusses how to do it. It is important to have the source far enough away, as explained in the book. Myron recommended the book highly. He used figures from it in his presentation. Myron offered one more bit of advice: don’t make a snap judgment based on one night of testing. Practice testing for several nights before drawing conclusions.

Old Business

- Treasurer’s Report—Tim Plunkett was unable to attend, and Glenn summarized the report Tim sent. Last month, we received dues from four more people and had no expenses. The Treasurer’s report for April 30 lists 24 paid members for 2014 and 1 for 2015.
- Star Parties, Events, and Meetings—The Caledon event for May 3 was successful. Glenn said we had no visitors. He mentioned being inspired by Bart to attempt to see some stars occulted by the Moon but finding he was watching the wrong star when Bart said it was gone. Bart explained he had learned about occultation observing from a talk by a member of the International Occultation Timing Association (IOTA) at the imaging conference the previous month. IOTA organizes teams of observers to time occultations by the Moon and asteroids, and it is a way to help gather significant scientific data with fairly modest equipment. The IOTA annual meeting this year is in July at the University of Maryland and is followed by an observing event where the asteroid shadow path is predicted to pass through our area.

Glenn reported on the Renaissance Faire outreach event on May 17. He and Bart talked about astronomy in England in that era, and Glenn played the part of Thomas Digges, who helped introduce modern astronomy to England at the time. Some 2,700 people attended the Faire that day, and we had an enjoyable day with a reasonable number of people stopping by our booth, even if a small fraction of the total attendance. Glenn/Digges also led a couple of groups through demonstrations of the difference between the geocentric and Copernican heliocentric pictures of the solar system.

Scott Lansdale supported the Girl Scout event at Northumberland (same date as the May star party). He said there was pretty good seeing with some clouds. A long line formed while he was still setting up. Jupiter was one of the targets. Heavy dew became a problem after 11:15 or 11:30.

- Communications Committee Report—Don Clarke is working on setting up a location for images using Flickr. He said he was writing something up for Glenn to try and then would email the instructions after he and Glenn fixed any problems Glenn finds.

News/New Business/Announcements

- Star Parties, Outreach Events, and Meetings—May 31 is the next Caledon star party date. Astronomy Night at the National Mall is June 6 this year.

The club picnic date is August 23. Glenn said Scott Busby was looking for someone to organize some entertainment. Linda suggested Glenn could do his Thomas Digges character.

Glenn said the June 28 Caledon star party date coincides with a big Scouting event to be held there. There may be some early distraction but we also may get a large number of visitors to look through telescopes.

Myron told us one of the people in the Culpepper astronomy club has a 30-inch observatory in a good dark sky location. He thought he could arrange a time for us to go there.

Next Meeting

The next meeting is on Wednesday, June 18, 2014, at the Heritage Center in Fredericksburg.