Rappahannock Astronomy Club

Minutes, August 12, 2009, Meeting

In attendance:

- Barton Billard
- Scott Busby
- Don Clark
- Glenn Faini
- Joe and Sherry Francis
- Rob Friedel
- Tom Harmon
- Leigh Gettier
- Glenn Holliday
- Dan Lien
- Michael Masters
- Tim Plunkett
- Javier & Ruby Valverde

President Scott Busby opened the meeting shortly before 7:30 p.m. with introductions around the room. Twelve members and two visitors were present.

Program

Mike Masters continued his program on "How We See the Sky," subtitled "The Physics and Physiology of Visual Astronomy," after reviewing the topics he presented last month. His topics this month related to the atmosphere, sky, and types of objects, and included—

- Sky brightness
- Atmospheric seeing
- Zodiac light
- Atmospheric optical phenomena
- Double stars
- Star clusters (open, globular)
- Faint objects
- Planets.

Mike is going to put his presentation materials on the Club website. They will make an excellent reference to help in observing that can only be sketched here. For example, sky brightness is measured in magnitudes per arc second. The range includes the Moon at 3.4 magnitudes per arc second, Flagstaff at 18, and the darkest night sky at 22. Sky brightness affects what we can see. In some cases, choosing our magnification for viewing can help deal with it.

Atmospheric transparency describes light loss from Rayleigh scattering, ozone absorption, and especially aerosol scattering. The unit of measure is light loss per air mass, indicating the effect of looking through more air when viewing closer to the horizon compared with viewing closer to the zenith. Transparency tends to be worse when atmospheric seeing, or scintillation, is better. Scintillation is the fluctuating distortion caused by the turbulence that Myron Wasiutta talked about earlier this year. Humidity tends to help calm turbulence but often goes with poorer transparency.

Mike talked about and showed images of atmospheric phenomena. These include Rayleigh scattering, auroras, the green flash occasionally seen at sunrise or sunset, "sun dogs," and rings or halos. He is still looking to see the green flash himself.

Viewing double stars depends on resolution of the telescope and on effects of atmospheric turbulence on that resolution. Rayleigh and Dawes each proposed limits indicating when the angular separation of a pair of stars is enough to detect them as two stars. For example, a 10" aperture telescope is capable of separating stars 0.46 arc seconds apart according to the Dawes limit for two sixth-magnitude stars (equally bright). To observe doubles, pick a good seeing night and remember that similar magnitudes are

easier. A good confirmation is to try to estimate their position angle visually and then check what the chart shows. Chances are that if you were able to correctly tell the direction of an imaginary line through the two stars, you were resolving them. Be prepared to use high magnification, and remember that below about magnitude 8, the transition to seeing with the rods in your retina reduces your visual resolution.

For star clusters, Mike suggests using the magnification that best frames the open cluster with a little space around it, or the highest magnification allowed by the seeing in the case of globular clusters (the same as for planets). For faint objects, Mike described the findings of a study by Blackwell of contrast thresholds made for coastal defense in World War II. It shows that small objects drop below threshold first, so that we need to use enough magnification to make them large enough to discern. Roger N. Clark came up with optimum magnification to use. Planets are bright but with surface details of low contrast. The suggestion is to use high enough power to comfortably resolve detail (at least 150x and up to the maximum that seeing allows—rarely more than 300x to 400x).

Mike concluded with a number of tips for viewing faint deep-sky objects. Find the optimum magnification using Roger N. Clark's recommendation or see websites suggested in Mike's presentation package. Filters help (Mike talked about several types: he likes oxygen III filters), as do averted vision and waiting for full dark adaption. An eye patch can help keep one eye dark adapted. Bigger apertures help.

Business Meeting

Scott started the business meeting with a discussion of recent events. An amateur astronomer discovered a strike on Jupiter revealed by a blotch similar to what some of the medium fragments of Shoemaker-Levy left in 1994. Saturn's rings were nearly edge-on as viewed from Earth at the time of our meeting. The Perseid meteor shower peaked during the week. Glenn Holliday said he saw a news item about detection of tektite-like material in another star system (http://www.nasa.gov/mission_pages/spitzer/news/spitzer-20090810.html).

Treasurer's Report

Tim Plunkett said the total balance in the July 31 report reflects the Universe DVD purchase, two new members' dues payments, and a donation a member made by rounding up his payment for his Galileoscope order (occurred earlier but left out of the June report). The check to the Astronomical League for renewal of the Club membership will appear in the next report. The Club has 21 paid members as of the end of July.

Committee and Star Party Reports

Leigh Gettier had stepped out of the meeting with our visitor to talk about beginning astronomy. We felt that information was as good as a report.

Glenn Holliday talked about the Scouts' clinic held the day of the July Caledon star party. He had 6 attend. At the subsequent star party, the boys were enthusiastic even though we had to look through holes in the clouds early in the evening when they were there.

Scott said the sky improved later after some of us left the star party. He got his Andromeda photo that evening. We attempted to hold a star party on the backup date, but weather washed it out. The next star party date is Saturday, August 15. Glenn agreed to send status emails because Mike was going out of town. The Club picnic date is August 22, starting 1 to 2 pm, and a star party is planned for that evening, weather permitting. Scott said he would be on travel until the day before. He requested and got volunteers to pick up chips, dip, and drinks (to be reimbursed by the Club). He also said pot-luck side dishes or desserts would be appreciated.

Old Business

Galileoscope purchase—Tim submitted two orders, and the smaller order arrived, but not the order of 12. He will attempt to inquire about the status of the missing order.

Universe DVD series—Tim brought the DVD set and suggested that the Club could add it to the library and lend out individual DVDs to allow more members to view the series.

Virginia State Parks request for a program at Westmoreland (September 25)— Glenn has talked with Annette Bareford, the Virginia State Park person requesting our help with a program. She mentioned some construction is starting. The location of the event is still to be determined.

Future Club meeting program contacts—The Club voted informally to table the topic until we get a response from Mark about a preferred date.

Status of Club loaner assets—Glenn passed the Club PST to Dan Lien. Brenda has the Club Dob. Tim has the Club equatorial telescope and suggests interested Club members should email him to arrange to borrow it.

New Business

Dark Sky sites—Rob Friedel is looking into the Powhatten Wildlife Management as a potential site for Club events. Mike Masters also found a contact and learned there is a fee for parties of more than 12 people. He has requested clarification. Don Clark asked about Crockett Park as a possible site for an impromptu star party. Joe Francis has done some further investigation of Big Meadows and may have found a more authoritative contact. His contact suggests we could arrange a star party at Big Meadows by obtaining a special use permit. He found out the name of the woman in charge of that and will get details of what is required from her. His contact seemed interested in making things work out. Members discussed things we could ask about, such as arranging access to the fire road and whether we could set up on the helicopter landing area. Scott suggested that people proposing dark sky sites first make a visit and find out about arrangements.

Change in Club website administrator—James Bingham stepped down as website administrator and Mike Masters took over the duties. He has made some changes to give it a more up-to-date look and organization. He gave us a quick tour of the new website. There are still some parts to finish updating, and he asks for emails if someone finds any broken links or problems.

Program topic for September meeting—Scott said he would show the DVD on “The Star of Bethlehem.”

Contact about special sky events for a wedding—Mike Masters described an interesting request he received about scheduling a wedding some time next spring to coincide with an astronomical event.

Sheila Newsome enquiry about event at Curtis Park—Glenn Holliday asked whether the Club had responded to the recent request, and it appears we may not have sent a response yet. Glenn volunteered to formulate a reply to her.

Next Meeting

The next meeting is scheduled for September 9, 2009, 7:30 p.m., at the Pizza Hut, 1224 Powhatan St., Fredericksburg.

Submitted by Bart Billard, Secretary