

Rappahannock Astronomy Club

Minutes, May 17, 2017, Meeting

In attendance:

Bart & Linda Billard
Don Clark
David Hiles

Matt Ring, Matt Jr, and Lovelle
Ross Cseemes
Tom Watson

Tom Watson began the meeting at about 7:00 p.m. with his program on satellite photography. Nine were present, including 3 visitors. Tom also conducted a short business meeting afterward because both the president and vice president could not attend.

Program

Tom presented "Photography of Satellites," by which he said he meant manmade Earth satellites. He told us his reasons for imaging satellites included that they were interesting and fun to see, and they were good for introducing beginners to astronomy. Tom also said it was rewarding to see what he could learn. He gave an example of photographing a North Korean satellite after seeing statements indicating it was tumbling that were then contradicted by North Korea. He was then able to see for himself that it was tumbling.

Next, Tom addressed what things affected being able to see and photograph a satellite. First, he mentioned the darkness of the sky and other things affecting astronomy, such as clear skies and transparency. He said conditions were better when the Sun was near, but below, the horizon, for example after sunset or before sunrise. Tom said getting an image of a satellite could be as easy as pointing the camera up (west after sunset or east before sunrise) and taking a 10-second exposure while the sky is just dark enough for it.

Low Earth orbit satellites are easier to see, but not late at night, while higher satellites can be seen later, but are not as bright. They include lots of scientific and communication satellites with orbital periods of about 4 hours. Tom said geosynchronous satellites, with 24-hour orbits, could be seen any time of night, and there were some satellites with higher orbits taking more than 24 hours. He said these satellites, some the size of a minivan, were very hard to see, and he had had numerous comments online claiming it was impossible when he posted images of them. He explained how a minivan-sized satellite could be visible at 25,000 or more miles, pointing out the overheating effects of sunlight in a vacuum without filtering by Earth's atmosphere that made it necessary for the satellites to be shiny. Tom said a lot of satellites were at about third to fifth magnitude, which one could see by eye in dark conditions, and definitely with a telescope, assuming the Moon was not up. He noted that satellites did not light themselves, and we would not see that light if they did. Instead they reflected light, usually from the Sun. He said reflections could be an effect of scattering or sometimes a "flare" in which a flat surface of the satellite aligned to reflect sunlight right at the viewer. A very high satellite could sometimes do this in the middle of the night. Tom said you could also see a satellite by silhouette, usually against the Moon but also against the Sun if you had filters to safely view it. He warned it should only be tried with proper equipment and mentioned the dedicated, narrow-band hydrogen alpha telescopes, one of which the club had available for loan, would work best.

For photographs, Tom recommended a DSLR camera, along with a tripod, and added that some cell phone cameras would work at night. He recommended using the camera timer even with a tripod because pressing the release on the camera could still cause blur even on the tripod. Certain tripods, Tom said, could be made to track satellites. He recommended adjusting the white balance, and a color temperature setting of about 5,500K would be a good setting. Tom said you could use the "kit" zoom lens that came with your camera and try about a 3-second exposure with wide-open aperture and relatively high ISO. You could then focus on a star while zooming in using the display on the back, and then set the timer release to take the picture. He showed us some fancier, but still inexpensive, lenses. They included a very wide angle 8-mm lens, a fast f/2 lens, or a wide-angle converter you could screw onto your own lens, if you didn't mind distortions around the edges. Filters were also useful, Tom said. He had a \$20 red filter that could get rid of the yellow sodium line of a lot of light-pollution sources.

Tom finished his presentation with a selection of images on his laptop. First he showed some “not-satellites:” airplanes that showed dashed lines instead of a continuous streak and a firefly that looked somewhat like a meteor. As he showed satellite images, he told us how you could use the free planetarium program, Stellarium, to identify satellites you found. It could simulate the location time and the area of the sky in the image and would show the satellite passing by. You could then click on it to get identification. One of his satellite images was the North Korean satellite he mentioned earlier. Don asked Tom what he thought about the news that some companies wanted to put thousands of satellites in orbit. Tom agreed it would be really bad for astrophotography as well as astronomy to have satellites going through images all the time.

Old Business

- Treasurer’s Report for April 30, 2017—Tim Plunkett’s report showed \$40 in dues payments received for the month. We now have 22 paid members for 2017 and 2 paid for 2018.
- Events—The Stratford Hall event early in the month was a success. About 45 people attended. The next Caledon star party was scheduled for May 27. Some students from Fredericksburg Academy could be attending. Scott Lansdale’s email indicated two upcoming outreach events he would be doing with David Abbou. Any other members interested in participating should feel free to contact Scott. One of these events was scheduled for June 2 at Mountain View High School. Another was scheduled for July 1 at Embrey Mill, and Mark Burns would also be participating.

Next Meeting

The next meeting is on Wednesday, June 21, 2017, at the Central Rappahannock Heritage Center with Scott Lansdale’s presentation on the Sun.