Rappahannock Astronomy Club

Minutes, March 20, 2019, Meeting

In attendance:

Jean Benson
David Bentz
Bart Billard
Scott Busby
Glenn Faini
Glenn Holliday
Jerry Hubbell
Chris Law
Scott Lansdale
Curtis Martin
Tim Plunkett
Ryan Rapoza and daughter
Matt Scott
Myron Wasiuta
Tom Watson

The meeting began shortly after 7:00 p.m. Fourteen members and 2 visitors were present.

Program

Scott Busby presented “Telescope Mounts” after a brief period of introductions. He called telescope mounts the second most important thing about astronomy, saying he was inspired to do a presentation when a visitor to our January meeting on equipment brought in what he had picked out from a collection left by his father and it turned out he had a very good telescope but no suitable mount. Scott’s presentation emphasized understanding what a mount does before getting into choices of mounts.

First, Scott presented diagrams of “Earth as an observing platform,” showing its orbit and tilt and discussing its rotation speed in space. He also showed the sky as seen above someone’s horizon, defining the zenith as the point straight overhead and the meridian going from north to south through the zenith. The rotation speed takes about 4 minutes less than 24 hours from one time a star crosses the meridian to the next. Someone said our days are longer because Earth moves in its orbit enough to change the direction where the Sun appears by the angle Earth turns in about 4 minutes. Scott also showed examples of star charts and explained the right ascension and declination coordinates on the celestial sphere used for stars and other objects on charts.

Scott explained tracking stars involved rotating the telescope about a polar axis (parallel to Earth’s rotation axis, which points at the north and south celestial poles) to compensate for the Earth’s rotation moving the telescope away from its target. He described how to do polar alignment to get the telescope to track by rotating parallel to Earth’s axis. For visual observing, getting within a degree of parallel should be good enough to follow an object for a half hour or so, but much more accurate alignment is needed for astrophotography. Scott said there are fancy telescope mounts with built-in GPS receivers to help you do the alignment. He also mentioned Polar Scope Align (available online). This app shows what you should see when sighting the sky parallel to the telescope’s polar axis.

Scott talked about tracking rates that mounts with motor drives offer. Sidereal rate tracks stars. Solar rate goes about a degree farther every 24 hours to follow the Sun’s apparent motion as Earth orbits it. He warned that we must not try to observe the Sun without a telescope with a proper filter. There is a lunar rate that compensates for the Moon’s orbital motion. Jerry Hubbell mentioned that the controller he worked with does not compensate for the declination component of the Moon’s motion. Tim Plunkett commented that fortunately, short exposures were possible with lunar photographs.

Scott had some pictures illustrating the history of mounts. One was Herschel’s mount for his 40-foot telescope, a crude alt-azimuth mount with block-and-tackle elevation adjustment and a group of assistants (possibly with mules) required for azimuth adjustments. Hershel discovered Uranus with the telescope—Uranus can be seen easily with much smaller telescopes and modern mounts. Another example was the mount for the Yerkes 40-inch refractor (still the largest refractor made). Scott said he was able to experience the floor moving up and down to allow him to reach the eyepiece on his trip to see the Yerkes Observatory. He showed the 100-inch Hooker telescope mount with a yoke design that could

not get within 30 degrees of the north celestial pole, and the yoke/horseshoe design for the 200-inch telescope that solved the problem. That mount uses oil bearings with an oil type formulated for the purpose. Scott's final example was the alt-azimuth mount for the Subaru 8.3-meter telescope. The telescope has adaptive optics and compensation for field rotation that results from alt-azimuth tracking.

The presentation ended with a sampling of mounts available for amateurs. Scott first showed a DM4 alt-azimuth mount. It has no motors for tracking but includes a computer that can tell you how to push your telescope to an object. The next alt-azimuth mount example was an iOptron Cube Pro 90 that included "go-to" capability and could take an 8-pound load. Scott also showed examples of a Dobsonian mount and a fork mount. They are alt-azimuth mounts, but some fork mounts offer an option of adding a wedge to make them equatorial. Scott described the range of options for amateur equatorial mounts, which he said run from about $300 to thousands. Amateur German equatorial mounts include manual tracking versions and computer-driven version. Scott and Jerry talked about a new low-end go-to model Jerry brought in. It had a capacity of 19 pounds including counterweights, or 15 pounds for use in astrophotography. Scott showed a picture of the mount in his observatory, an AM400 Takahashi high-end mount. He ended with some images taken with his telescope.

During the introductions, one visitor had mentioned going to Catharpin Road recently looking for a dark sky observing location and learned that it was near where Scott lived. This visitor asked for Scott's assessment of his observatory location. Scott said he could see about magnitude 5, but that it was closer to magnitude 6 when he moved there.

Old Business

- Treasurer's Report—Tim Plunkett presented the reports for January 31 and February 28. The total amounts received were $202.50 in January and $7.50 in February. There were no expenditures. Paid memberships for 2019 reached 29 and 3 members are paid through 2020.
- Vice President's Event and Club Loaner Equipment Reports—Glenn Holliday said we had a nice star party in February but March was clouded out. He said the next star party would be April 6, but he would not be able to be there. Glenn H. still needed some programs from member volunteers for the spring star parties until he would be able to participate this summer and maybe recycle some of the past programs he has given. On April 5, the day before the April Caledon star party two other events are scheduled by other groups who invited RAC participation. One is scheduled at James River Park, a new International Dark Sky Site, and the other is scheduled at a brewery. Myron Wasiuta said it was Bald Top Brewery and indicated he thought he would go. Glenn H. explained he would be doing his Elizabethan astronomer characterization for the Renaissance Faire again during the spring. Tom Watson said he had a club camera, the Orion Star Shoot camera and would bring it in to a club meeting. Glenn H. said Ranny Hefflin was supposed to have the club 6-inch reflector, but he had not found a way to contact Ranny about it. Scott Busby confirmed he had the club solar telescope. Glenn H. mentioned Scott B's offer to be a central custodian for all the loaner equipment. Scott said he would be able to show borrowers how to use the item they were checking out if they were picking it up from his house.
- MSRO Report—Myron said the two refractors at station 1 and the LX 200 at station 2 were operational, and both stations were available for members to use remotely. Jerry added that the MSRO Commission meeting would be held Friday after this club meeting, and he would have an update after that for April RAC meeting.

New Business

- Members at Large Confirmation for the Executive Council—Glenn F. moved that "…the Rappahannock Astronomy Club approve my nominations of:
    - Linda Billard—Stargazer Editor
    - Don Clark—Webmaster/Domain Administrator
    - Scott Busby—Yahoo Groups Administrator
    - and Jerry Hubbell—MSRO Assistant Director

  as Members at Large for calendar year 2019." Glenn H. and others seconded the motion, and it was passed with none opposed. Glenn F. said he would coordinate with Linda to schedule and Executive Council meeting to be held at her house.

- Embroidered RAC and MSRO Patches and Gear—Glenn F. passed around the embroidered patch sample showing the design he had ordered from Rocky Top Embroidery. A number of members commented on the good quality. Glenn F. moved, "…that the Rappahannock Astronomy Club reimburse the President, Glenn Faini, the $25 fee for Rocky Top Embroidery to create the RAC embroidery design." Jerry seconded the motion, which also passed with none opposed. As shown in the agenda, the $25 reimbursed to Glenn F. was the setup fee for the embroidery design based on the club logo, then embroidery cost would be $18 each for quantities of 1–10 or $15 each plus a 10-percent discount on clothing for quantities of 11 or more. Glenn F. would like to have club Officers and Members at Large wear embroidered polos. He moved that the Rappahannock Astronomy Club make an initial order of 25 RAC Logo patches from Rocky Top Embroidery. All new club members, beginning in 2019, will be given a club patch for joining. Existing members may purchase club patches for $10 each. Jerry, Tom, and others seconded. Glenn's discussion points were that he thought the patches would provide advertisement and foster club pride. He calculated the initial cost of 25 patches would be $375 plus tax and the club would recover $200 if 20 existing members bought patches. The motion was approved with one opposed. Glenn F. also told us Rocky Top Embroidery can set up a website for members to shop purchases. He also said he had looked into Queensboro as another source. They are less expensive, but they offer no patches, and we would have to place an order without having a preview of the design.
- Lending Library—The next topic was disposition of the books, magazines, etc. in the lending library. Glenn F. moved "… that the Rappahannock Astronomy Club do away with the RAC Library and position of Librarian. To that end, all RAC library materials shall be brought to the next business meeting to be offered to club members or recycled." More than one member seconded. Myron said he had a collection of historical documents from earlier days of the club and would like any similar materials to preserve along with what he has. Jerry(?) suggested the *Stargazer* newsletter was the only historical record currently being kept. Tom proposed modifying the motion to separate any historical documents from magazines and such. Glenn H. offered an amendment to separate historical materials that Myron wanted from the other materials being disposed. Glenn F. also modified the motion to allow disposition to be later than the next meeting. The modified motion was passed with one opposed.
- Other Discussions—Tom showed an AstroTech AT 72 ED astrograph, which he said might reflect a new trend. He said it was "apochromatic," but used a doublet, not a triplet. (The "ED" refers to special glass that is better for correction of chromatic aberrations.) Tom said he was getting his best images yet with this small (72-mm aperture) telescope.

Next Meeting

The next meeting is on Wednesday, April 17, 2019, at the Headquarters Library on Caroline Street, downtown Fredericksburg. We will be in room 1.