

Rappahannock Astronomy Club

Minutes, July 18, 2018, Meeting

In attendance:

Pierre Avila
Jean Benson
Bart and Linda Billard
Scott Busby
Don Clark

Glenn Holliday
Scott Lansdale
Tim Plunkett
Matt Scott
Matthew Turner

The meeting began at about 7 p.m. Nine members and two visitors were present.

Program

Following the business meeting, we discussed "Astronomy in the News." Glenn Holliday started off with two good news/bad news items. His good news item was a detailed image made with the MeerKAT radio telescope array of the Sagittarius A* region that includes the supermassive black hole at the center of the Milky Way. The MeerKAT array is a precursor to the Square Kilometer Array telescope. Another effort is underway to combine radio telescopes planet-wide for even higher resolution. Glenn said we could expect a lot of papers from these data. His bad news item was the news of another delay of the launch date of the James Webb Space Telescope (JWST). Glenn showed a chart plotting updated launch date projections versus the date when the change in the projection was made. Below it was a straight line matching the date on the vertical axis to that on the horizontal axis. The projected launch dates also appeared to form a straight line suggesting further updates would eventually have the two lines cross in 2026. Glenn noted that the JWST was designed for launch on a European Space Agency (ESA) Ariane 5, which is going to be phased out as ESA moves to the Ariane 6. There was a danger the JWST would not have a launch vehicle available if it is delayed too much.

Bart Billard talked about detection of a high-energy neutrino by IceCube, a cubic kilometer of Antarctic ice equipped with an array of 5160 light detectors. The 290-trillion-electron-volt (TeV) neutrino was detected last September 22. An automated update system established the previous year sent out a notice to astronomers with details of the path within a minute of the event. It resulted in observations at multiple wavelengths that found a likely source, a blazar designated TXS 0506+056. For example, the FERMI satellite showed the blazar was located within 0.1 degrees of the position found by IceCube and was showing an increase in gamma ray emissions at the time. A search of past neutrino detections at IceCube revealed a period of 150 days when about 13 more neutrinos than normal were detected from that source. Bart showed a *Science Magazine* [news item](#) with a schematic drawing of how the neutrino was traced backward by the detectors that tracked the shower of charged particles created by the collision of the neutrino with a nucleus in the ice. Dots represented the arrangement of the detectors in the ice, with color and size coding indicating the timing and amount of light detected, respectively. The earliest detections were in blue on one side of the array, and the latest were in yellow on the other side. All were centered along a red line drawn to represent the neutrino path. This observation provided evidence that quasars, thought to be active supermassive black holes emitting jets of particles and radiation, are sources of cosmic rays. Blazars are quasars with a jet pointing in Earth's direction. The advantage of detecting the neutrinos was the ability to pinpoint their source because neutrinos are not deflected by matter or magnetic fields the way charged particle cosmic rays are.

Scott Lansdale showed a "baby" exoplanet image obtained by the Spectro-Polarimetric High-contrast Exoplanet Research (SPHERE) instrument on the Very Large Telescope in Chile. He mentioned SPHERE recently obtained a sharper image of Neptune than Hubble could do. Scott also talked about a visit to Palomar that he was able to make while in California for work. He arrived at a time he thought would be early for a scheduled tour and found out all the tour tickets were taken 15 minutes earlier. However, as he started on a self-guided tour, he met a girl who had extra tickets she could not use, and he was able to take the tour after all. Scott Busby described the book, *A Perfect Machine: Building the Palomar Telescope*, by Ronald Florence, which he had read and reviewed for the April *StarGazer*.

Don Clark said he had seen a story on black hole formation by giant stars in the early universe. Linda Billard talked about a recent article on the discovery of twelve new moons of Jupiter, bringing the total to 79 known satellites of the planet. All but one of the outer 10 have retrograde orbits (opposite to Jupiter's rotation).

Glenn brought up a study that suggested 80 to 90 percent of asteroids fell into eight classes by chemical composition. It suggested they might all trace back to eight protoplanets that broke up. Scott Lansdale showed a photo of the Green Bank Radio Telescope and described how visitors could get a tour that took them (when the reflector was leveled) up one of the support booms to the location of the feed horn. Glenn said he saw a story that ESA and the Chinese Space Agency announced a plan for cooperation on going to explore the Moon. Scott said he always dreamed of having a big telescope on the Moon. Glenn agreed and said he had read about having a crater on the far side filled with mercury to make a large mirror. Scott Busby recounted doing planetary imaging in recent months, starting with Jupiter, then Saturn, and lately Mars. He said one of his Saturn images was his best ever and even showed the Encke Gap. On the other hand, Mars now has a global dust storm going on. Linda said she saw an item indicating some recent Curiosity data suggests the storm may have diminished lately, and she was doing a newsletter article about it. Scott agreed he may have seen a little detail coming out again.

Old Business

- Club Yahoo Group Update—Scott Busby had an update on the problem with the disappearing calendar entries. He recently found his entries for July were intact and said it appeared that he could only populate the current month. There was some discussion of groups.io as an alternative. Scott's impression was that it was not user-friendly.
- MSRO Update—Bart reported on purchase of a camera that supported timing occultations of stars by asteroids that would be used as an upgrade for the SBIG camera. For the benefit of the visitors at the meeting we digressed with a description of MSRO and how club members could get training to use it.
- *StarGazer* Update—Linda reported that she had all but one item she needed to complete the current issue for the end of the month.
- Events Held—Glenn and Scott Lansdale reported a good turnout of about 20 people. Glenn reminded himself he needed to send a report to the Park for use in their reporting to the State Park system. He said his program at the beginning of the evening was about black holes. The weather started out clear, but some clouds formed as it was getting dark. They lingered about 45 minutes. Viewing included Jupiter, Saturn, M6, and M7. Scott also thought he had the Swan Nebula, but concluded it was the Eagle Nebula after he got home with a picture he took.
- Treasurer's Report—Tim's report had the receipt of Payal Patel's club dues and an expenditure to reimburse her for the gotprint bill. The list showed 21 members, counting family members. Scott Busby noted Tim had forgotten to include him on the list. They had an arrangement for Tim not to reimburse him for hosting the club picnic, but simply to credit him as having paid his dues. Tim indicated he would correct his records. Bart passed on a check from Ron Henke for 2 years' dues.

New Business

- Planned Outreach Events—Embrey Mill was the next planned event, with David Abbou as the point of contact. The date was July 21 with a backup date of August 17. Longer term, an outreach at Stratford Hall was scheduled for November 10. Glenn noted Stratford Hall is farther east than Caledon, and the skies are darker. Caledon could be pretty good but had gotten worse in the last 20 years. He said there would be Saturn, Mars, and a 3-day old Moon in the sky for the Stratford Hall date.
- Club Picnic—Scott Busby explained the plans for the club picnic on August 11. He said he would provide food and drinks, including hamburgers and hot dogs. Club members did not need to bring anything but themselves, unless they wanted to contribute a salad or dessert. The picnic would be held rain or shine. A star party would follow, weather permitting. There would be a short club meeting emphasizing brainstorming ideas for newsletter articles and club meeting program topics. The club picnic is a members-only event.
- Meeting and Star Party Programs—The next program would be September. At the April meeting, Tom Watson volunteered to do the September program. Jerry Hubbell would be doing the

October program and Bart would do December. The September and October Caledon programs would be “Class M Planets. Can we find one like ours?” and “Death from Above. Getting hit by an asteroid could really ruin your day.”

Next Meeting

The next meeting is the club picnic at 3:00 p.m. on Saturday, August 11, 2018, at Belmont. Weather permitting, Scott Busby will also host an evening star party afterward. This meeting and star party is members only.