

Rappahannock Astronomy Club

Minutes, April 15, 2015, Meeting

In attendance:

Terry Barker
Bart & Linda Billard
Don Clark
Ron Henke

Glenn Holliday
Jerry Hubbell
Scott Lansdale
Tim Plunkett

President Ron Henke called the meeting to order shortly after 7 p.m. Nine members were present.

Program

Ron Henke presented the program "Are We Alone?" He outlined the subject, which he limited to the question of whether other intelligent life exists in the universe, not simply bacteria, with a list of arguments that have been made over the years.

First is the Fermi Paradox, which refers to Enrico Fermi, one of the physicists of the Manhattan Project and a pioneer of weak nuclear theory. One day, Fermi and three colleagues had a lunchtime conversation at Los Alamos about UFO sightings that were in the news in 1950, and agreed advanced extraterrestrial civilizations probably existed. A little later, out of the blue, Fermi asked, "Where are they?" (Some accounts suggest it was "Where is everybody?") His colleagues, one of whom was Edward Teller, immediately recognized the paradox of so many possible intelligent civilizations, some likely much more advanced than we are, and yet we have no evidence of any contact.

Ron then described the Rare Earth hypothesis proposed by Peter Ward and Donald Brownlee. It suggests that many attributes of Earth might be significant for the development of our civilization and are not accounted for in Drake's Equation. Ron then demonstrated a "rare Earth hypothesis calculator." He put in estimates he thought Ward and Brownlee might have used: 500 billion stars in the galaxy, 9 in 10 with planets, 1 in 10 of those metal rich, half in the habitable zone, etc. Some of the "rare Earth" attributes included being in the galactic habitable zone, meaning not in the core of the galaxy where stars are crowded and not spending too much time in the galactic plane where interstellar gas could perturb comet orbits and bombard us. Also there were entries for the fraction of planets with a large moon, the fraction with Jupiter-sized outer planets, and the fraction with a critically low number of extinction events. When Ron finished entering estimates for all the attributes, the calculator gave the answer for the number of advanced civilizations in the Milky Way as zero. He said with the various combinations of estimates he tried, he never saw a result larger than four.

The "Great Filter" concept named by Robin Hansen in 1996 offers another explanation for not seeing signs of advanced alien civilizations. Ron explained it proposes reasons advanced civilizations might be hard to get. It includes ideas such as "berserker scenarios," in which one advanced civilization sees others as competition and works to eliminate them, natural activities masking signals and preventing us from detecting them, natural disasters, and a "fundamental technology" that wipes out civilizations. He suggested reading the Frederick Pohl short story, "Fermi and Frost," in which nuclear weapons are seen as such a technology that might be the answer to the Fermi paradox.

Ron also had a Drake equation calculator. He said Dr. Frank Drake is a radio astronomer, and his equation was used as the agenda for a meeting in 1961 exploring the possibility of detecting signals from intelligent extraterrestrial civilizations. He said Drake's current estimate using this equation is that there should be 10,000 civilizations in the galaxy capable of communicating with us. The last topic was the "Mediocrity Theory," a counterpoint to the rare Earth hypothesis. It says, "There is nothing special about Earth, it is not the center of the universe, the Sun is not an unusual star..." In the end, despite all these theories, the answer still seems elusive.

Jerry Hubbell also showed us some lunar imagery. He had a full Moon image he had mapped with The Lunar Terminator Visualization Tool (LTVT) to show how it would appear from the side. He also showed some crater images, telling us how mapping with LTVT can undo the foreshortening that makes circular craters seen from an oblique angle look oblong. Jerry demonstrated a simulation of the appearance of the

Moon throughout its orbit, including the changing phase and libration. He also told us of a new Mallincam Micro Series CCD video camera that could be used for outreach to display color images of deep-sky objects on a monitor. The camera body is \$99.99, and a package that also includes cable, power supply, and nosepiece adapter is \$169.99.

Old Business

- Fan Mountain—Scott Lansdale reported six of us met for dinner in Charlottesville then drove to Fan Mountain, climbing a long, winding gravel road to the observatory. The telescope tours included programs on spectroscopy and infrared light studies of Io. A shower during dinner gave way to clearing skies in the evening, and they were able to get Jupiter in the telescopes. Scott said Jupiter was a little disappointing in the 40-inch telescope, and worse in the 30-inch.
- Public Outreach Event for England Run Library June 6—Ron was planning to talk about buying a first telescope, and Jerry was planning to talk about lunar stuff. With Scott they would have three types of telescope to display. They were interested when Bart Billard said he had a department store telescope that could be used as an example of what not to buy. Glenn Holliday volunteered to try to give a presentation. He was also planning to represent RAC at the Renaissance Faire. Someone may want to use the constellation viewer given to the club by Jane Towner at the last Northumberland outreach. Linda Billard offered to print club brochures for handouts at the outreach and to coordinate getting the club solar scope from the Busbys.
- Update on the next Newsletter Status—Linda said she expected to get the rest of the articles she needs in a week.
- Communications Committee—Terry Barker said 90 percent of the punch list is done.
- Educational Star Party April 24 and Other Outreach Events—Ron said he would really like more people to participate and help out him and David Abbou. Jerry said Bob Moore told him a block of rooms may be arranged for volunteers to stay overnight for Astronomy Night at the National Mall. About five members were planning to participate. Ron said he sent an email after the last meeting to the Mountain View High School student who attended with his father but has not seen a reply.
- Next Caledon Star Party—The next Caledon date is April 17. Glenn said it would be nice to give some feedback to Caledon for their metrics about how many visitors attend the star parties. Bart agreed to do the website update the morning of the star party when Scott sends him an email about whether it is on or not.
- Treasurer's Report—Tim said the March report showed three dues payments with Astronomical League dues included. One payment was overlooked in a previous report, which he discovered when depositing checks last month. The club now has 14 paid memberships for this year and 1 for 2016.

New Business and Astronomy News

Jerry suggested we might use some club funds to support young would-be astronomers. He thought Explore Scientific could probably donate something to help with the cause. Terry said the Richmond club has given out prizes at science fairs. (Some years there were no astronomy-related entries.) He proposed a committee to find a science fair. Ron asked Terry if he would volunteer, and he agreed. Ron said the topic would go on the agenda for the next club meeting. There was some discussion of revisiting the possibility of the club becoming a tax-exempt organization.

Glenn said the Messenger probe is running out of fuel, and we should watch for NASA attempts to get images from very close to Mercury before Messenger crashes.

Scott mentioned Astronomy Day, which we have not done in a while. We set up for it at Borders before it closed but have not found an alternate. Glenn suggested considering Pratt Park as an Astronomy Day venue possibility in the future (the next date is in October). Our contact there expressed interest in having us back following our transit of Venus outreach there.

Next Meeting

The next meeting is on Wednesday, May 20, 2015, at the Central Rappahannock Heritage Center.