

Rappahannock Astronomy Club

Minutes, February 17, 2016, Meeting

In attendance:

Terry Barker
Bart & Linda Billard
Don Clark
George Clarke
Ron Henke
Glenn Holliday
Jerry Hubbell

Scott Lansdale
Lauren Nicholson
Aiden O'Leary
Tim Plunkett
Ryan Rapoza
Tom Watson

The meeting began a little after 7 p.m. Thirteen members and 1 visitor were present.

Program

After the business meeting, Ron presented a program on the book *Rare Earth*, by Peter D. Ward and Donald Brownlee. He said it discusses the “Rare Earth” hypothesis (not theory, according to the authors), which proposes there may be many unusual characteristics of the Earth and its environment that may be necessary for the development of complex life here, therefore implying that complex life is rare in the universe. Ron told us the authors, Ward a paleontologist and Brownlee an astronomer, happened to sit together in a cafeteria and found they were both thinking Earth could be unique. The Rare Earth hypothesis was one proposal Ron talked about in his last presentation about ways to explain the “Fermi Paradox” that asks, “If intelligent life is common in the universe, where is everybody?” He said in their book, the authors are talking about complex animal life, as opposed to bacteria, which they consider common, or simply multicellular life.

Ron summarized a number of characteristics of Earth and its environment that might be unusual. Star sizes are important: Vega is 2.2 times the mass of the Sun and will “live” only a billion years—oxygen took 2 billion years to develop on Earth. Red dwarfs are too small: planets have to be close enough to be tidally locked to allow liquid water to exist, and they would be subject to harsh effects of frequent coronal mass ejections. A right-sized star still requires a planet to be in a narrow range of orbital distances. If Earth were 1 percent farther from the Sun, all water would be frozen; if 5 percent closer, all water would boil.

We are finding many exoplanets in systems unlike the solar system. Except for Pluto, solar system planets do not have the very elliptical orbits often seen elsewhere, and “hot Jupiters” are often found. If they formed farther out like the gas giants of the solar system and then migrated inward, it would be bad for the inner planets.

The size and distance of the Moon from Earth could be important. The authors argue that the Moon stabilizes the tilt of the Earth’s rotation axis, keeping it in the right range to have seasons that are not too extreme. A number of characteristics relate to the Earth’s position in the Milky Way and to the kind of galaxy it is. Spherical and elliptical galaxies have older, more metal-poor stars. Near the galaxy center are bad conditions. The likelihood of encounters with other stars disturbing the orbits in a planetary system located in a globular cluster would not favor development of complex life. Ron summarized with a “Rare Earth calculator” exercise, putting in his estimates for the likelihood of characteristics of a planet that might support complex life and showing what the assumptions imply about the likely number of suitable planets in the galaxy. He said he found the book hard to read because some of the points were not so deeply explained.

Old Business

- Stargazer Update—Linda Billard said she just delivered the latest issue and had nothing to report on the next issue other than having a few possibilities for articles noted down.

- Communications Committee Update—Tom Watson reported on possibilities for social media presence for RAC. He said he found the club has a Twitter account and that Twitter has metrics that can help us find interested people to target our efforts to make people aware of us. Terry Barker has the account and can provide the password for Tom.
 - Don Clark said he paid \$55.00 for a 5-year extension of the raclub.org domain name. He emailed Tim with the details of the expense.
 - Don has been running a tool to find broken links on the club website. He said he could get started soon on work to fix them.
 - Ron Henke said Terry may be retiring in mid-April, and we would need someone to take over the club website maintenance that he has been doing. Don said he take care of paying the bills for the Hostek account for the website. Ron said he wanted Jerry Hubbell, Tom, and Glenn Holliday to keep in contact about administering the website.
- Treasurer’s Report—Ron presented the December Treasurer’s report. It included no dues payments or expenditures, so the balance remained unchanged from November. The final count of paid memberships for 2015 was 20, and the number paid for 2016 had reached 6 by the end of the year.

New Business and Astronomy News

- Additional Outreach/Star Party Events at Belmont—Ron brought up discussions he had had with Scott Busby concerning Scott’s desire to support some additional activity at Belmont, opening it up more officially for some functions. We could have an event every month on the Saturday following the Caledon date, and possibly turn some of them into a broader outreach event, perhaps once a quarter. Ron wanted to sound out the club members on their willingness to support the additional outreach events that would entail.
- Don said the Night Sky Network sent three pins to award the people who have done the best outreach. He said we would need to decide on the distribution.
- Marine Corps Museum Outreach, March 12—Ron reported the museum had 200 attendees last month. He said the time for the event was trimmed to 5:30–8:30, which would provide little darkness but the Moon and Jupiter would be up for viewing. He was concerned the proposed site would not be good for viewing to the south and would visit to check out alternatives. Astronomical twilight would be 7:42 p.m. Ron surveyed members. Glenn said he might have a conflict, while Tom was “95-percent certain” he would be there. Jerry, Scott, Bart, and Linda also said they could go.
- Astronomy on the Mall—Ron showed us the response he sent about our attendance:
 - Yes, the club would attend.
 - We would send four people.
 - We would not need any chairs or tables.
 - We would not be bringing any tents.
 - As the event was still some time off, these items might change.
 Ron said the date chosen was June 10, with a June 11 rain date.
- Other Requests for New Events—Ron listed five pending requests. Shiloh Park, in King George County off Route 205 between Routes 301 and 3 requested an event, perhaps in July. Tim Smith was the contact. Glenn expressed concern that it was a low area with surrounding trees limiting views near the horizon, but it would be okay for higher objects. Ron noted July was the only month without Caledon plus an additional event through September. Ron said the date for the event for Garrisonville Elementary School was April 22, and that he and David Abbou would do it and Park Ridge Elementary School May 13/14. Ron discussed a request for an outreach at Embry Mill Park/Café. He was concerned about the commercial nature of the venue. While we had done events at Borders in the past, it was at our request, not the store’s. He thought a solution might be for the invitation to be from the park rather than the café. Ron reported an around-the-world boat trip patterned after Polynesian migration would have a stop at Montross on the Northern Neck May 12, and organizers were interested in having an astronomy outreach. He noted it conflicted somewhat with our scheduled Northumberland Outreach May 13/14. Ron showed the current version of the event calendar. He said the April 16 Stafford Park event was at Curtis Park, and the one on September 10 was at Pratt Park. He also pointed out a conflict between our June Caledon date and the Mall event rain date, proposing he should say we cannot

support the rain date. Ron said Stafford Parks and Recreation advertised tours of the night sky for the Curtis Park event. He said he was hoping Myron could support it.

- 2017 Star Party Weekend—Ron informed us he proposed May 6 instead of April for this Stratford Hall event. It would include dinner and an overnight stay at Stratford Hall. Ron said John Bachman offered us three complementary rooms to stay overnight. If four RAC families wanted to go they could split the cost of one more room for only about \$30 each. We would have to provide night viewing the first day and solar viewing the next morning. Also, someone would need to give an astronomy program in the dining room.
- Mark Slade Remote Observatory Progress—Jerry told us he and Myron got the observatory operational over the last month. He said only the dome shutter and a couple of other things still required manual operation. The telescope has produced great images with no guiding. However, there was a failure in the mount over the weekend before the meeting. Jerry said he and Myron planned to get the drive fixed and purchase some spare parts for about \$300.

There were a few bugs to work out, but Jerry operated the observatory and took images remotely (after Myron opened the shutter). The dome had some problems with slipping of the wheel that encodes its position in cold weather below 25 to 32 degrees.

Registax was loaded on the computer to allow stacking video into JPEGs that can then be downloaded. Jerry said that was one way to work around the limited bandwidth that precludes downloading video off the computer.

Next Meeting

The next meeting is on Wednesday, March 16, 2016, at the Central Rappahannock Heritage Center.