

Rappahannock Astronomy Club

Minutes, September 14, 2011, Meeting

In attendance:

- Barton & Linda Billard
- Scott & Debbie Busby
- Don Clark
- George Clarke
- Brenda Conway
- Joe Fordham
- Joe & Sherry Francis
- Rob Friedel
- Ranny Heflin
- Glenn Holliday
- Jerry Hubbell
- Mike Masters
- Tim Plunkett
- Javier & Ruby Valverde

President Mike Masters began the meeting at 7 p.m. after introductions. Seventeen members and a visitor were present.

Program

Joe Francis presented the program on the “Evolution of Stars.” Stars form as clumps of denser matter develop in giant molecular clouds, and gravity begins collapsing them and pulling in more matter. The paths they take depend on the amount of mass. Brown dwarfs form when the mass that comes together is less than 8/100th of the Sun’s mass ($0.08 M_{\odot}$). More mass requires higher temperatures in order for the pressure to balance the gravitational force, and brown dwarfs’ mass does not produce high enough temperatures to start the fusion process. Therefore, they cool off over a period of hundreds of millions of years. Larger masses require more pressure and temperature, and the new stars reach the temperature that starts fusion of hydrogen nuclei, 10 million Kelvin or more in their cores. The energy produced by fusion balances the energy that stars radiate, and the matter stops collapsing. Smaller masses are more common, and of the stars that ignite fusion, 85 percent are small enough mass to become red dwarfs. The next higher range of mass includes the Sun and most other stars. In this range, stars eventually become white dwarfs after the hydrogen in their cores is used up by fusion. Stars at $1 M_{\odot}$ end as white dwarfs of $0.6 M_{\odot}$. Larger stars leave larger white dwarfs, up to $1.4 M_{\odot}$. Beyond this mass, the cores of dying stars are too massive to become a white dwarf, and a small number of very large mass stars eventually become supernovas and leave a neutron star (1.4 to 2 or $3 M_{\odot}$) or black hole (more than 2 or $3 M_{\odot}$) as the remnant. Some white dwarfs that have a companion star orbiting close enough gain mass from that companion. They can get enough new hydrogen mass to flare up as a nova, and those that reach the critical mass of $1.4 M_{\odot}$ this way collapse and fuse all at once as a type of supernova.

Lifetimes of stars range from millions of years for the most massive to trillions for the smallest. Most of their lives are spent consuming their hydrogen in fusion reactions at a fairly steady rate (dependent on their mass), which produces a pattern of brightness versus color called the main sequence. Red stars are dim, yellow stars are brighter, white stars brighter still, and blue stars brightest of all while they are all on the main sequence. Toward the end of their lives, stars leave the main sequence as their fusion fuel runs out. Stars like the Sun expand and become red giants before losing their outer layers to leave behind white dwarfs. More massive stars become red giants or supergiants. We have a long time to wait for red dwarfs to leave the main sequence.

Old Business

- Treasurer’s report—Tim’s report included July as well as August. In July, he received another dues payment, and the number of paid members reached 31 for this year.
- Status of Club loaner equipment—Mike still has the Meade and also has the Orion Star Shoot camera donated by Jerry. Brenda has the GEM Orion. She was planning to check out the Club solar telescope for some school events.

- Star Parties, Events, and Meetings—Westmoreland, 23 July, and Caledon, 30 July, events were both cancelled because of weather. The Girl Scout & Juno mission event worked out OK. They were able to view the Moon with binoculars. The Club picnic had to be delayed to 3 September because of the hurricane. Scott presented his expenses for picnic supplies (\$109.10) and raffle prizes (\$69 net after raffle proceeds), and Ranny moved, with second by Joe to reimburse Scott for the raffle and picnic expenses. The motion carried. Glenn said the Hartwood event was successful, with a large attendance. More than 100 people viewed the Sun with the Club solar telescope. There were invitations for the Club to attend other events as well as return next year for this one. Because of the size, it needs larger Club participation. The next Caledon event was 24 September. A Girl Scout group planned to attend, and the date coincides with National Public Lands Day. Mike planned to take his solar telescope, and Brenda said she hoped to take the Club solar telescope, but she needed to check her calendar. The next event was a Stratford Hall outreach on 1 October. Mike said he planned to make the weather decision early that Saturday morning. He would try to be there at 3 p.m. for viewing with his solar telescope starting at 4 p.m. For the October meeting, Brenda is scheduled to present an update on the Mercury mission. It is also the meeting for nominations. Mike said that Tim and Bart were willing to continue as Treasurer and Secretary, and he reminded us we need nominations for Vice President and President. The October Caledon star party date is the 22nd. There was a request for support for a Westmoreland Montessori School program, 18–19 October. Glenn and Joe said they may be able to support it.
- Draft 2012 star party schedule—Mike summarized the schedule, which was sent for comments by email in July. Most primaries are at Caledon and most backups at Belmont Observatory. Two outreaches around the first quarter Moon are allocated for Westmoreland and two for Lake Anna. An additional three first quarter Moon dates are open for outreach events. Ranny moved with second by Joe that the proposed schedule should be sent to Caledon, Westmoreland, and Lake Anna for their comments, and the vote was in favor.
- Heart of Virginia Star Party—Glenn is coordinating Club participation. The dates are 18–20 November. Mike said that car camping was permitted.
- Meeting location committee update—Mike spoke with Pam Bosch of United Methodist Church (UMC) about the meeting room we had looked at. From the conversation, he found that apparently donations were not necessary for us to use the room. Mike noted that the committee had not developed any alternatives, and we reviewed the pros and cons of the location. The size of the space is an improvement over the current room, and we would be able to stay longer. The room has glass windows at the front overlooking a gymnasium below, food may not be permitted, and there appears to be a lack of connectivity. Some members mentioned conflict with the day of the week the room was available. After discussion, Ranny made a motion to try the UMC meeting room, and Joe seconded the motion. The motion failed on a show of hands.
- Equipment Upgrade Committee update—The current thinking was that we should try out the Orion Star Shoot camera that Jerry donated for a while and possibly save up for a future purchase of a suitable setup/mount. The committee would benefit from some help from Club members currently doing astrophotography.
- Question of retention in Club Library of old issues of *Sky & Telescope* and *Astronomy* magazines—Tim said that keeping them at his house was not really bothering him. He suggested we could consider disposing of older ones, possibly giving them away.

New Business/News Items

- End of Year Recognition Awards—Mike said that he formed a committee with Joe, Bart, Scott, Glenn, and Leigh to recognize service to the Club. He asked allowance to defer revealing the choices of honorees until the awards could be presented at the end of the year. Scott made a motion, with Joe seconding, to authorize expenditure of up to \$150 on the awards for those to be recognized this year, and the vote was in favor of the motion.
- Request from CRRL England Run—Mike said that Rebecca Purdy of the England Run Branch of the Library contacted him. England Run has applied for a Discover Earth grant, and she asked whether the Club could hold a star party and provide a light pollution presentation if the grant is made.
- Stafford Elementary After School Enrichment—The school is looking for teacher(s) for four Mondays from 14 November through 5 December to give a 1½ hours on a passion or a hobby, and possibly

also a star party. David Abbou has said he can do one. Mike said that anyone who has something he could teach should contact Jim Riutta, the committee chair. The Club would have to respond in the negative if we cannot do all 4. Mike said a possible star party date was 4 November, with a first quarter Moon phase. Bart and Linda and Jerry were among those who thought they could support the star party.

- Meeting program topics for next year—Mike had Jerry talk about his contact with Tom Field about a program on amateur spectroscopy that he could do via the Internet. Jerry and Mike arranged for him to do the January program. Mike also said Myron Wasiuta offered a talk about the Moon for the February program. In addition Mike said Jerry planned two programs, and Ranny planned a program on DSLR Astrophotography.
- Glenn brought up the Hartwood Elementary request for an event on 28 October. He had not heard any more about it since the request at the Hartwood Days event, and Mike proposed we discuss it at the October meeting.
- Because of the postponement of the picnic, only four of the raffle prizes were drawn on the makeup date. Seven more prizes were drawn at the end of the meeting. They included a print of the Sun in hydrogen alpha light, a mounted M13 photo donated by Jerry Hubbell, and a Stargazer Interactive Star Chart.

Next Meeting

The next meeting is changed to Tuesday, October 4, 2011, because of a schedule conflict at the Library. The location is the Central Rappahannock Regional Library Headquarters, 1201 Caroline St., in Fredericksburg. Introductions will begin at 6:45 p.m.

Submitted by Bart Billard, Secretary