Rappahannock Astronomy Club

Minutes, May 17, 2023, Online Meeting

In attendance:

Scott Busby, Equipment Manager
Bart Billard, Secretary
Linda Billard, *StarGazer* Editor
Corey Dallmeyer, Outreach
Glenn Faini, President
Laura Greenleaf
Andy Hulon
Eileen Kragie
Mark McDonagh
Matthew Scott, Treasurer

The meeting began at about 7:00 p.m. with a presentation by Laura Greenleaf. Nine members also attended.

Program

Laura Greenleaf presented "Lighting Matters—Introduction to Light Pollution and Night Sky/Nightscape Conservation." She introduced herself as the volunteer representative of the Virginia chapter of the International Dark Sky Association (IDA). Laura noted the International Dark Sky Association was transitioning to Dark Sky International, but she had not yet updated her presentation package, nor had the IDA website been updated. She told us she was not an amateur astronomer but was a Virginia master naturalist. Laura got into this when she moved to Richmond after a lifetime living in the country under dark skies. That "transformational experience" led her to become an active member of IDA in 2013, first co-leading the chapter with Laura Graham, and now as the sole representative.

Laura began the presentation with a quick introduction to IDA, defining light pollution and providing a "lighting 101" discussion of the foundational knowledge. Additional topics were human impacts, ecology and wildlife, and then a focus on IDA conservation efforts and some pointers on how people can make a difference in their communities.

Laura said IDA was a recognized authority on light pollution and the leading organization combatting light pollution worldwide. Founded as a nonprofit in 1988 by a pair of professional and amateur astronomers, it had an office in Tucson, Arizona. She discussed some of IDA's focus areas, including public policy activities such as promoting partnerships, helping to design legislation and ordinances to reduce light pollution, responding to requests for public comments, and participating in efforts to improve lighting by partnering with the lighting industry on effective and quality lighting designs. Also, IDA sponsors efforts in conservation and education and outreach. Laura listed areas that light pollution affects, including astronomy, energy use, ecosystems and wildlife, and health. She noted astronomy was still at the heart of IDA's mission, but the organization was concerned with all these aspects, none of which could be separated. She gave as examples the recent advocacy for effective regulation of satellite constellations such as Starlink and support of public outreach programs such as Globe at Night. All that was needed was a smart phone for people to contribute to the data on light pollution.

Addressing the connections between the impacts of light pollution, Laura pointed out that every day included daytime and nighttime, and life had evolved with the patterns of day and night and their variations throughout the seasons. However, in the past 100 years, humans were changing night into day in an (unplanned) "experiment," to the detriment of every living thing on Earth. She showed a photo of the night sky at the Boundary Waters Canoe Area Wilderness in northeastern Minnesota (an IDA "Dark Sky Sanctuary") to illustrate what nighttime was like everywhere not that long ago. In contrast, to show what was now normal to most people, she presented a picture of London's night sky, with the question "Why is the sky orange??" That was what she asked a friend she visited on a trip there when she was in college.

Laura then said sky glow was only one aspect of light pollution and listed glare, light clutter, and light trespass as others. She commented that light trespass, the intrusion of light onto private property and into people's homes was the #1 reason people contacted her in the past 10 years. She said glare and light clutter caused problems seeing things, an effect that increases with age.

A nighttime photo from space of part of the U.S. east coast illustrated waste because light was just being dumped upward into the night sky. Laura said the photo was out of date, and it was probably much worse now and recently may have been getting worse at a faster pace. She said such photos had been used at

times as proxies for “progress” or “prosperity.” She listed sources of light pollution as lighting that is unnecessary, badly located/aimed, poorly designed, overly bright, or too blue. An outdated illustration about lighting design showed, from “very bad” to “best,” a light that was not cut off, semi-cutoff (still letting some light go upward), cutoff (no light above the horizontal), and full cutoff (all light confined to a cone well below the horizontal). She said now the “BUG” (backlight, uplight, and glare) classification, a system devised by the Illuminating Engineering Society (IES) was used.

Laura said IDA worked with IES to produce a set of guidelines for lighting design. It described five principles for lighting design with explanations on how to address them: lighting should be useful (have a clear purpose); be targeted (directed only where needed); have low light levels (no brighter than necessary); be controlled (on only when it is useful); and be [the right] color (warmer color where possible). She showed a Kelvin scale of color designations that was a good start for addressing the last guideline and said a color temperature of 2700K or lower was a pretty good choice. The slide indicated that glare increased with color temperature.

Laura showed a slide about acorn lights, which she said were a pet peeve of hers. It said “There is nothing ‘historic’ about a glare bomb. NO MORE ACORN LIGHTS.” She explained that even if there were some dating back to the 1920s, they had less lumens than today’s acorn lights. The slide showed four examples of period-style and pedestrian-scale lights that meet IES standards. She said there were also other possibilities. Next she addressed LED lighting, saying that 10 years ago, we were told that LED conversion would solve light pollution or save the planet, which has not been the case. She said the influence of the rebound effect—using more of something when it is cheaper—combined with poor design, and the habits of thinking “brighter is better” actually contributed to more light pollution. She explained that LEDs contributed to increased light pollution, including increased glare and more sky glow because LEDs with bluer color were initially cheaper and manufacturers failed to use adaptive control, which LEDs could support. Laura included a slide illustrating what could be achieved with well-designed LED lighting.

Human impacts included a list of actions by the American Medical Association supporting mitigation of light pollution and a discussion of circadian rhythms. It was followed by IDA conservation efforts, from designating International Dark Sky Places and Dark Sky Sanctuaries, to recognizing good stewardship in efforts to improve urban areas. She said Dark Sky Sanctuaries were remote and isolated, with few nearby threats. The designation tended to be to raise awareness, as a preventative measure. She also described Dark Sky Reserves, which were less remote and tended to have surrounding support areas, and Dark Sky Parks. All the definitions referred to “land possessing exceptional or distinguished quality of starry nights and a nocturnal environment that is protected for its scientific, natural, educational, cultural heritage, and/or public enjoyment.” Ongoing public access to specific public areas was included in the IDA designation for Parks. Astronomy clubs could help with aspects such as a measurement program to follow the evolution of light pollution. Currently, Virginia has five Dark Sky Parks—Staunton River Park, Rappahannock County Park, Sky Meadows, James River, and Natural Bridge State Parks. Laura grew up in the Area of Sky Meadows State Park. She said increasing light pollution remained a problem for maintaining its dark skies. She showed the most recent (2018) Virginia Outdoor Plan, which included recommendations for dark skies and encouraged citizen involvement and contributions to sky quality data. Her discussion of impacts on wildlife indicated not only light pollution, but nighttime lighting in general affected animals and insects in many ways. As many as a billion migratory birds were dying annually from collisions with buildings. Many migrate at night and are attracted to light or lose their way when stars are obscured.

Laura’s guidelines for protecting the night sky were: Light only what you need; Use energy-efficient bulbs and only as bright as you need; Shield lights and direct them down; Only use light when you need it; Choose warm white light bulbs; and…Join IDA! Afterward, Glenn Faini commented that the color temperature of 2700K she suggested seemed low. She agreed that Tucson had chosen 3000K when changing the street lighting, and that with the use of adaptive control, they had reduced the overall lumen output. Bart Billard asked whether there were modifications to help with acorn lights while waiting for them to be replaced. Laura thought there might be some to which you could add baffles to help direct light down. Andy Hulon asked whether the EPA addressed light pollution, given its effects on animals. She was not sure of its involvement but noted it had addressed noise pollution until President Reagan shut down that program. She also thought it might be difficult to prove the necessity of regulation, especially with recent court decisions curtailing EPA’s authority, and she was not optimistic about it. Scott Busby had an extensive interchange with Laura about attending council meetings and expressing concerns

when developers seek zoning changes that could affect light pollution and working with local governments on lighting ordinances. She recommended that if a Virginia locality did decide to work on a lighting ordinance that one should recommend that they contract with Bob Parks of the Smart Lighting Alliance in Fairfax. Scott also related his efforts when he lived in Stafford County to help write a lighting ordinance the county could adopt based on another Virginia county ordinance he found. He was told about the Dillon rule that reserves the authority to initiate ordinances to the state government. He said he also learned it was possible to make an ordinance anyway and as long as it was not taking money from the state, the state wouldn't care. Laura estimated there were some 25 county lighting ordinances in Virginia and argued that that established that the state had allowed counties authority to initiate lighting ordinances.

Old Business

- Treasurer's Report— Matt said two student members joined last month, adding $10 to our balance. He said Astronomical League dues ($7/50) would be due in the middle of June, so members who wanted to join or renew and get the subscription to *Reflector* should get their payment in to him before then, and he would send out a reminder about that.
- Vice President's Report—Glenn F. gave the report for Myron Wasiuta. He said there was a Natural Bridge State Park outreach on April 22 and asked Corey Dallmeyer whether he participated. Corey said he hadn't. Glenn F. said there was a James River State Park Outreach on May 6. Corey said he did not go because of the full Moon but he heard it was awesome.
- Secretary's Report—Bart said he had nothing to report.
- *StarGazer* and MSRO Reports—Glenn thought Linda Billard would not have a report so soon after the latest issue came out, and Bart confirmed she did not plan to give a report. Glenn skipped the MSRO report because Myron was not at the meeting.
- Communications Report—John Maynard was not at the meeting, and Glenn F. did not think there was anything to report about the website. He said Groups.io was running smoothly and nearly all our members were getting the emails.
- Club Inventory—Scott said he had nothing to report.
- Dark Sky International—Glenn said he was going to ask Eileen Kragie for a report, but she had left the meeting. He said he would think about whether to go directly to Laura Greenleaf for reports.

New Business

- Upcoming Events—Glenn F. asked Corey about the date for the June James River State Park outreach event. Corey's audio was breaking up, so Glenn asked him to send an email. A little later Corey was able to say it was June 17. Glenn said there were star parties Saturday after this meeting at Bowling Green and Belmont as well as star parties on June 17 at Bowling Green, Belmont, and James River.
- Other Items—Glenn F. said that we were up to 60 members this year, and asked for other new business. When no one offered any, he adjourned the meeting.

Next Meeting

The next meeting is on Wednesday, June 21, 2023, at 7:00 p.m. It is planned as an online meeting.