

First Light Lite

February, 2020 Edition

Jim Lynch – Editor

For a quiet month, a lot went on in January!!! So grab your coffee mug (or whatever beverage you prefer), settle in, and read on!

WEB SITE REJUVENATION

Our web site, redone about two years ago, has stagnated sadly since then. This is not a good thing for CCAS and its public image. Last year, CCAS Secretary Katie Sisson kept our timely announcements current, but with her absence this year due to travel, even our key current announcements (star parties, speakers, events) have not been updated routinely. And the more permanent content never really had anyone whose assigned task was to update it. As CCAS president, I will take the blame for not having this item covered adequately. But, as it has come up in recent emails to me (for which my thanks, even if it is not the type of news you like to hear), we need to see that the site gets updated in the near future, which includes rewriting (and/or removing) dated parts. Joel Burnett is working with me on beginning this task, starting 2/3/20. But we really could use more assistance, so if anyone else could volunteer a few hours, the help would be most welcome.

DOME REPAIR AND AUTOMATION PROJECT(S)

The dome repair project has now begun in earnest, with initial repairs by Pappas Company (lubrication, movement limits, shutter door) having been accomplished on January 6th. Further work on the dry rotted weather stripping will occur soon, completing the repair phase. Regarding the automation project, our fundraising drive is now up to \$3850, more than a third of the way to the \$10,000 goal. The technical committee for the dome automation should be formed and meeting soon, as we have enough funds now to start work.

NEW CAMERA OPERATIONAL

Our new camera, a ZWO ASI071 Pro Cooled Color CMOS Telescope Camera, was installed at on the PlaneWave scope (along with an eyepiece for visual viewing) last month, and was put through its paces by Gary Walker and Charlie Burke. In order to make sure the software could produce quick, “short stacked” images in a few minutes for star parties, Charlie Burke downloaded some free “SharpCap” software and, after the usual learning curve, got it to work. So now, if we ever get a clear night for our star parties (more on that just below), we are set for both visual and computer observing in the dome.

STAR PARTIES – HELP ALWAYS WANTED!

Being of Irish descent, I really shouldn’t rail against Murphy, but I think that he might be hexing us “just a wee bit” the past few months. The past three star parties have been cancelled due to weather, despite there having been a goodly number of crisp, clear winter nights in January and early February. I suppose that in reality that has more to do with the Cape’s climate overall. (It just feels good to blame Murphy once in a while.)

When the skies finally do clear, we really could use a little more help with our star parties from our members. Please contact WSO director Charlie Burke if you think you can come and help, even on an irregular basis. For members not familiar with the equipment, the regular WSO observatory crew are very good at showing you the ropes in very little time. The new scope is a lot easier to work with than the old scope, and it is fun to see operate!

DYHS AND OTHER STEM EVENTS

Interacting with DYHS educational programs is one of CCAS’ charter activities, and this year has been quite busy as regards that activity. This January, the fall astronomy honors projects were completed by Mr. Mitchell’s students, under various CCAS mentors and Mr. Mitchell. We are planning to show the

results of these projects at the April CCAS meeting. Also, Dr. Julia Sigalovsky's class was given a lecture and Sun viewing at WSO recently, with the Sun putting on an utterly disappointing show (solar minimum), but with the students still enjoying the plasma tube plus diffraction grating demonstration of the Sun's helium lines. Her class also heard a lecture by me the previous month on black holes, which vies with extraterrestrial life as being the most popular astronomy topic to talk about! (My admittedly dated grad courses in general relativity and quantum field theory still come in handy!)

SOME FURTHER STEM DIRECTIONS

In last month's First Light Lite, I mentioned that we would like to work more on a cooperative basis with the other nearby HS programs (and other educational programs) on the Cape. Toward that, things have moved along considerably!

On January 20th, representatives from DYHS, Barnstable HS, Sturgis Charter School, and CCAS met at Bobby Byrne's in Mashpee for a working dinner on possible mutual interactions. (Two representatives from Sandwich HS couldn't make the dinner, but are still part of our ongoing discussions.) From those discussions came a beginning agenda for collaborations "down the line," some of which have already happened.

On January 31st, I was invited to Barnstable HS to give talks to three of Mr. Mike Gyra's classes on the topic of (easy guess...) black holes. This interaction went extremely well, and between that, the Mercury transit of last year, and another program coming in March, I think we have the beginning of a good long-term relationship with another school program that is very gung-ho about astronomy!

Sturgis Charter School has also gotten interest in astronomy and CCAS from some of its students, thanks to CCAS member (and teacher there) Jolanda Ferguson. They also are interested in our upcoming March event.

Sandwich HS is interested in our star parties (and CCAS helping with theirs), as well as our March event. We are in contact regarding exact dates.

And finally, Eddy Elementary School in Brewster is having a hands-on event from 530-700 PM on February 11th, and has invited us to participate with a demonstration. If anyone is interested in helping with this event, please contact Jim Lynch at jlynch@whoi.edu.

So all-in-all, I think we have a good start with some of CCAS' near-neighbor schools.

Two more events are also coming up that we will have a part in:) "STEM Journey 2020" at Sandwich HS, which we participated in last year and was quite successful (more about that at our meeting on the 6th) and 2) the "Joy of Learning" series of four public lectures at the Falmouth Public Library, which I will give in April on astronomy topics.

And since I've more than slightly hinted at an interesting event in March, let me address that next.

MARCH EVENT

Sometimes it's who you know, not what you know. In this case, a lucky circumstance for me was that I am a friend and colleague of Dr. Art Popper from the University of Maryland, a noted marine biologist specializing in animal bioacoustics, especially as relates to fish. Art, in turn, is a friend and former U. Maryland colleague of Dr. Sylvester (Jim) Gates, who is a world-class superstring/supersymmetry theorist. Jim is also the current president of the American Physical Society, perhaps the foremost society for physicists in the world. He also has won many honors throughout his career. As one example, President Obama awarded Prof. Gates the National Medal of Science, the highest award given to scientists in the U.S., at a White House ceremony in 2013.

Anyway, Art Popper, being a very social fellow, thought to introduce me to Jim, and we have had a cordial email correspondence since then. Having been introduced to Jim, and being a shameless opportunist, I thought: "Is there any way we could get him to come to give a talk to CCAS?" We have had *very* good fortune in attracting some world-class astronomers to talk to us over the years, and since

I'm not afraid to be told "no" occasionally, I asked Jim, and to my delight, he instead said "yes."

Jim has an agenda item, too, to promote STEM education and activities among young HS students, with particular emphasis on underprivileged students. So he asked as a "quid pro quo" (not always a bad phrase!) that we buy a number of copies of his book "Proving Einstein Right" so that he could sign them and give them to the students attending his talk on March 16th. We more than happily agreed, and between generous donations to DYHS and Barnstable HS and our CCAS funds, we have collected enough to purchase 64 books. We also are coordinating efforts between the four schools discussed above to have students from all these schools, along with Cape Cod YMCA HS students, attend the talk, which will start at ~700 PM in the Knight Auditorium of Barnstable HS. Jim is a passionate educator (as are many of our speakers), and this talk cum book signing fits in wonderfully with CCAS' own mission. We look forward to his visit!

Upcoming Speakers

Note: We currently have CCAS First Thursday speakers lined up through April. We now are looking for further speakers for the 2020 schedule. If you are interested in giving a talk, or know someone who would be a good speaker, please contact Jim Lynch at jlynch@whoi.edu. Thanks!

February 6th, 2020

Dr. Ken Brink, CCAS, WHOI

Topic: Extraterrestrial Oceans

We are all familiar with Earth's oceans and their importance for life on this planet. In order to understand where else similar oceans might be found in the cosmos, we begin by considering what makes Earth-like oceans possible. These factors include the right solar heating, a magnetic field and plate tectonics. There are, within our own solar system, at least two other types of oceans. One, typified by Jupiter's moon Europa, exists because of tidal stresses which cause friction and thus warm

up an otherwise frigid ice-covered body. The apparent resulting ocean lies beneath 10-30 km of solid water ice, but it has potential as a locale for life. A second type of liquid feature occurs on the very cold Saturnian moon Titan, the only moon in our solar system with an atmosphere. In this case, methane lakes occur as part of an evaporation/precipitation cycle not unlike the water cycle on Earth. These three types of “oceans” are what we know to exist: other forms are possible.

March 5th, 2020 (Perhaps at Falmouth Public Library – vote at the meeting!)

Dr. Glen Gawarkiewicz, WHOI and Mr. Paul Fucile, CCAS and WHOI

CubeSats

April 2nd, 2020

DYHS Projects

DYHS Mentors and Students

Last Month’s Speaker

January 2nd, 2020 (at Falmouth Public Library)

Dr. Jim Lynch, CCAS, WHOI

Topic: Basics of Optics for Amateur Astronomers

ABSTRACT: Since Galileo, optics and optical instruments have been the "bread and butter" of astronomy. In this talk, I will go through the basic laws of reflection and refraction, the lens-makers' equation, the basics of telescopes, the diffraction limit, dispersion, optical gratings, and finally some modern optical physics. Some simple lab demonstrations will be included, time permitting.

I think the abstract talks adequately about the physics, which is mostly basic, but absolutely essential to our hobby. So let me touch on two other items.

First, the Falmouth location was very convenient, and the facilities excellent. We had a good crowd of ~30 people, with both Falmouth and the Dennis-

Yarmouth area being well represented. I'd like to see CCAS use Falmouth and perhaps 1-2 other Cape Cod town facilities occasionally during the year, as a way to attract more members and interest.

Second, I was pleased to see that the diffraction grating and focusing optics demonstrations went well, but was disappointed that I didn't get to the Snell's law (which was discovered long before Snell, as you would know from the talk!) demonstration. Perhaps at the next meeting!

November Meeting Minutes and CCAS Business

The meeting portion of the evening consisted of a brief discussion of the status of the new telescope, the new camera, and upcoming events.

Star Parties

After August until mid-June, we will (generally) have two regularly scheduled Star Parties each month taking place at 7:30 -10:30pm on the *Saturday* closest to the date of First Quarter Moon (about 7 days old). This is an increase from our old schedule of one per month in the fall, winter, and spring.

From June through August, we have three regularly scheduled Star Parties each month taking place on *Thursdays* at 8:30-10:30pm.

When the moon is near its First Quarter, the terminator (the line dividing light from dark) is favorable for viewing sunlight or shadow on the sides of craters. This time is also favorable for observing the dark side of the moon occult (visually cover) stars in the sky as the moon moves in its orbit. Depending upon the calendar, we may also be able to observe planets and other celestial objects.

Here is the schedule for "Star Parties" up to March, 2020; **the public is cordially invited!**

February 1st, 22nd

POSSIBLE CANCELLATIONS for Star Parties: Cancellations will be very rare since we have lots to do "inside" as well as outside. Even if the forecast is "iffy"; the Staff Leader for the night may elect not to cancel in case of possible clouds. If clouds arrive after staff and guests have convened, a virtual Star Party will usually

take place indoors to include overviews of the sky for that night using computer simulations with our big screen TV, videos of interesting sky events recorded previously, demonstrations and/or training on the use of scopes and other equipment, and consultation/discussions on things astronomical, etc.

However, sometimes a solid forecast for overcast or rain or a storm will result in cancellation of a given Star Party. **IF IN DOUBT ABOUT THE WEATHER AND THE STATUS OF A STAR PARTY, CALL THE OBSERVATORY AT 508-398-4765 AFTER 7:45 pm.** No answer means the event has been cancelled.

Directions to Dennis Yarmouth HS and Schmidt Observatory

For information on the location of our Dome behind Dennis-Yarmouth High School, click on the purple button "Old Website" and once there, click on "Meeting Location" viewing the two maps that are there: external for the Dome, and internal to locate the high school library where meetings are held.

For meetings, drive in the south entrance road and go around behind the main building. Park in the lot about halfway down the building and go in the back door and turn down the hall to your left to find the library.

For Star Parties at the Dome, drive in the north entrance road all the way past the north side of the main high school building, through a gate, and on to park near our Dome.

H&K directions (note January 2020 exception!)

Please be reminded that Gus Romano or his delegate host a dinner gathering for members and friends each CCAS meeting night (before the meeting) at the South Yarmouth Hearth & Kettle restaurant at 5:45pm; (the meetings begin at 7:30 at D-Y.) The speaker for each meeting is always invited. Please join the group to dine and talk about all things interesting, including astronomy, each month before our meeting. The H&K is at 1196 Rt 28, South Yarmouth, about a half mile west of the Station Avenue/Main Street intersection with Rt 28 (stop light).