**First Light Lite**

May 1, 2019

Jim Lynch - Editor

This has been a quieter month, by and large. Sometimes that is a good thing… 😊 But there have been a *few* happenings, so here goes.

We are currently finishing preparations for a STEM activity at Sandwich High School entitled “STEM Journey VI”, originally scheduled for March 2nd, and now rescheduled for Saturday, May 4th from 3-6 PM. It should be a good one, featuring 40 booths and a NASA lecture from 4-5 PM. We could still use one or two more people to man our booth, if anyone is interested

We had one good clear night for our star parties, which given how wet this Spring has been, was not so bad. Sadly, all the planetary activity is in the early morning of late, so we lost a few of our usual major attractions. But the winter and spring constellations were bright and clear, so all things considered, we did well.

The new telescope, which has been ordered, has been slightly delayed due to back orders (installation date seems to fluctuate). In the interim, a 14” Celestron scope is being set up, so that star party visitors can get a good view from inside the dome. New alt-az power cables for that scope have been obtained, and are now in hand, so that we should be good in May for some dome viewing. The CCAF board members have agreed upon a special celebration event for the new scope in mid-June, if all goes as planned. More on that to come.

Also, further work has been done on our “projects” initiative. The idea is to have all our club members sign onto some “hands-on” projects, akin to the projects given to the DYHS students, to test them out, as well as to get involved (if not already) with some real observational astronomy. This would be done by groups, pitched at a level commensurate with amateur astronomy, and include at least one experienced member to help each group. I have created, using the DYHS projects and an excellent book entitled “Astronomical Discoveries You Can Make, Too,” a first order list of projects. That list is attached to this email. We will briefly discuss that list and “logistics” at the May meeting, during the business portion of the meeting. After that meeting, I’d like to ask people (via an email) to pick their top three choices of projects to join into. Hopefully, we can start some of these in June, and we’ll set aside some time to discuss the technical aspects at the June CCAS meeting. These projects are designed to be do-able by amateurs without technical backgrounds, so I hope people will not be reluctant to try them!!!

Finally, for those who want to follow up more on the imaging of a black hole that was done recently, the book “Einstein’s Monsters” by Chris Impey gives a very nice history of this VLBI (very long baseline interferometry) project, along with some good technical background, pitched at a general public level. It is a bit of a shame that the book came out in 2018 rather than this year, in that the book’s ending is a bit of “The Lady or the Tiger?” ending, and not the glowing triumph that eventually emerged.

**Upcoming Speakers and Topics**

**May**

**Mr. Jim Mitchell, DYHS.** Jim will speak on the Dennis-Yarmouth HS Astronomy Honors Project Program.   Specific projects will be discussed and demonstrated by Mr. Mitchell and the CCAS mentors that have helped with this program.

**and**

**Dr. Mike Hunter, CCAS.** Mike will be giving the Werner Schmidt Observatory Update. Emphasis will be on the new telescope and on Observatory activities.

**June – Dr. Dierickx has had to reschedule due to travel obligations, so we are looking for a speaker. If we don’t find one, we will use the hour to discuss the observational projects.**

**July (11th, not 4th!!!!!!)**

**Dr. Larry Marschall, Gettysburg College, topic TBD.**

**August**

**Dr. Antony Stark, HSCfA, topic TBA**

**Last Month’s Speaker**

**Dr. Charles J. Lada, Senior Astrophysicist, Harvard-Smithsonian Center for Astrophysics**

**Exploring the Great Hunter: Unlocking the secrets of star birth in Orion.**

In that Dr. Charles Lada (Charlie) wrote a rather detailed abstract, I will just repeat it here, followed by a brief recap of his talk in my own, less eloquent words.

**Abstract**

The constellations of the winter sky harbor some of the most spectacular objects known to astronomy. For example, within the boundaries of Orion, the Great Hunter, is the nearest Giant Molecular Cloud, though invisible to the eye. Giant Molecular Clouds are the largest and most massive objects known in the Milky Way galaxy. The one in Orion spans nearly the entire extent of the visible constellation. These immense dark clouds of gas and dust are also the coldest objects in the universe and the most prolific birth sites of stars and planets in the Milky Way. In this lecture I will present a tour of the visible and invisible Orion, my favorite constellation. I will reveal some of the secrets of star birth that astronomers have wrestled from the Orion Molecular Cloud using observations across the electromagnetic spectrum. In this tour we will encounter mysterious protostars, bipolar jets and outflows, infant star clusters and the proto-planetary disks where new systems of planets are currently being formed.  I will also discuss what we have learned from studying Orion about range of masses that stars acquire at their birth (the so-called initial mass function or IMF). Finally I will describe the important underlying connection between the Great Orion Nebula and the famous Hyades and Pleaides star clusters, all prominent in the Winter sky.

RECAP

First, it was good to have Charlie Lada come back to visit CCAS again. He attracted a *very* good audience, as usual!

Charlie loves the history of astronomy as well as its technical side, and this was evident in the first part of his talk, which covered the history of the Great Orion Nebula, starting from the Sumerian era (~2700 BC) and proceeding up to today. After a tour through some fascinating historical pictures and graphics, Charlie moved to the physical nebula itself, starting with the familiar view in visible light. Many of these pictures were quite familiar to our amateur astronomers – the Flame and Horsehead nebulae, for instance.

Then the talk delved deeper, into the spectral bands that are invisible to human eyes, but not to our instrumentation. After a brief recap of spectra, the HR diagram, and other basics, Charlie started showing how Orion looks in the infrared band, and at the greater resolution our space telescopes provide. All of a sudden, familiar objects look very different! A particularly striking example was that of a dark dust cloud seen in half a dozen wavelengths ranging from 0.44 microns to 2.16 microns. At the shorter wavelength, the cloud obscures the background stars, but as the wavelength increases, the dust scattering weakens and the background stars become visible!

From there, Charlie moved to the birth of stars, showing an interesting construct called the “initial mass function.” This function posed an interesting question – *why are there so many little stars produced?* (Also see the interview with him about this in the Feb 2019  *Astronomy* magazine). Delving further into the production and birth of stars, Charlie then showed another set of spectacular slides on how “dark cores” produce new stars and solar systems. Perhaps the most amazing one was the slide showing strong bipolar jets coming from a new star, in close analogy to the jets that are seen coming from active black holes and galactic nuclei. The scales are very different, but the pictures (and perhaps some of the physics) are virtually the same!

The relation between the Orion Nebula, the Pleiades and the Hyades (all winter sky super attractions) was next on the list, with “age” being the basic answer to the riddle in the abstract above.

As a finale, Charlie played a movie made by his colleagues that showed the beauty of Orion accompanied by the very appropriate music of Mozart’s “Eine Kleine Nachtmusik.”

**April Meeting Minutes and CCAS Business**

The April business meeting was a pretty close repeat of our March one! To repeat:

Our CCAF officers gave the latest update on the status of our main observatory telescope replacement. We're looking at about two months (guesstimate) overall for the new scope to be installed, and we will be training a core of people on the computer software needed to use it.

Jim Lynch further discussed the “projects” idea with the members, and will be pursuing its initiation soon.

Jim Lynch also discussed pursuing membership more aggressively this year. Since then, we have made some good progress with this initiative, which VP Ashish Dutta is heading.

**Star Parties**

From September until late June, we will 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 late 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 spring “Star Parties” up to July, 2019; **the public is cordially invited**:

May 4th and 11th

June 8th, 15th and 27th

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 spite 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 half way 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**

Please be reminded that Gus Romano or his delegate “host” a Dutch-treat 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).