

First Light Lite

April 1st, 2026 (No foolin'!)

Jim Lynch – Editor

Message from the CCAS President

Observationally, this winter and early spring has been a bust for CCAS. The midwinter blizzard followed by a long cold spell left the grounds by the Werner Schmidt Observatory snow covered for a long period. And when the snow was done with us, the clouds largely took over. However, being Cape Cod based, we're a bit used to this, and will just "keep calm and carry on" as the old phrase goes. We will be scheduling star parties this spring, which is "the season of galaxies" riding high in the sky. Our WSO scope provides a great view of these deep sky objects.

And, as stated in our last FLL issue, we are keeping busy in the meantime with indoor activities and equipment preparations for the spring. One of these activities that you might enjoy is our social dinner before the First Thursday talks. Currently we are doing this at the Sea Dog restaurant in South Yarmouth, as the H&K restaurant shut down recently. Check the end part of this newsletter for more information.

Outreach and Coming Events

I'll try not to go into too much detail, but we now have requests for talks and star parties from nearly a dozen venues, schools, and organizations. We do our best to honor these requests – education and outreach are two of our Society's core functions. We very much enjoy interacting with people about astronomy and STEM. If you on the mailing list are interested in helping us staff some of these events, please contact us via cca@capecodastronomy.org and we will provide you with further information. We *really* could use a few extra hands!

Let me share a few examples of our recent and *coming* outreach.

In mid-March, we visited the DYHS science club (on Friday the 13th, for the superstitious among you) and are hoping that we will have more interactions with them during the spring, including an observatory visit. We also have the DY Middle School lined up to visit us.

Over the next two weeks, we set up tables at the Falmouth HS STEM fair and the Bourne Intermediate School STEAM fair. We had a good time talking to people both young and old about what you can see in the night sky, and indeed I

hope some of those people are reading this newsletter! The photo below is of me manning our setup at Falmouth HS last week at what was a great family event. (Chris Lynch did the photography.)



A “coming events” example is Peter Pilon and other CCAS members participating in the Chatham Eldredge Library exhibition of astrophotography which will be running during month of April, and also in a free stargazing event at the Monomoy National Wildlife Refuge on Saturday April 18th at 8:30 PM (rain date April 19th at 8:30 PM).

Another “coming events” example is the talk that Brian Twohig will be giving at the Centerville Library on “Astronomy on Cape Cod” at 2:00 PM on April 28th. As Murphy would have it, I also will be giving a class/talk at the Orleans Library on cosmology on April 28th at 1:30 PM. These are two different topics, so please note you have a choice! (As a note, Murphy seems to do a lot when it comes to scheduling things in general! ☺)

Astrophotography

An opportunity to learn astrophotography “from the ground up” will be offered to all by CCAS later this year and is currently in the organizational stage. Peter Pilon and other CCAS members have formed an astrophotography group that will focus on using the new, inexpensive smart scopes as well as our dome

telescope at the Werner Schmidt Observatory. He and other experienced members are planning to offer a course on that for members and friends after doing the organizational work. More details will be forthcoming in the near future, but if you're interested in astrophotography, please contact our Cape Cod Astronomy email [cca@capecodastronomy.org] and let us know.

“CCAS’ Future” Workshop

Two years ago, after Covid had abated and we were able to meet in person again, we held a mini-workshop dinner at Bobby Byrne’s Pub in Hyannis where we discussed future directions for CCAS. This was moderately successful, but we didn’t accomplish quite as much as we hoped.

This year, we will repeat the process, tentatively at our July meeting. We would like to ask all you who are reading this for inputs about how we can improve our club’s science and education programs, increase our membership, advertise better, and any other aspects that you can think of. Please send your input to cca@capecodastronomy.org . If you are coming to the Sea Dog dinner this Thursday before Dr. Milingo’s talk, please consider bringing some input there as well.

Elections in Mid-June

Each year, we elect a full slate of CCAS officers and one CCAF Board member. As Janice Marks is also standing down as a Board member, we will need two Board members. We welcome all nominations for these positions up until mid-June. On a personal note, I would like to see some new people interested in these positions. They are part of sharing the responsibility as well as the fun of being in a club and also are not horribly onerous.

Initiatives and Committees

When we do our forum/workshop , we will likely devote some time to committee structure. We are currently looking at the following committees: Website, History, By-Laws and Organization, Advertising and Publicity, and Membership. As with being an officer of the Society, committee work “makes the wheels turn” and is important to our future.

Last Two Month's Speakers

February 5th Speaker: Dr. Jim Lynch, CCAS/WHOI

Place: Both at the DYHS library and on Zoom

Title: "Cosmology – the large and small of it"

Precis: As those familiar with me know, one of my main hobbies in retirement is learning cosmology theory. As part of my effort, I thought to give a CCAS talk on the always popular topic "Can anything exceed the speed of light?" In assembling this talk, I've developed some theory which, if it is correct, could be quite interesting. This theory parallels, though not exactly, some theories in the current literature, particularly those of well-known cosmologist Neal Turok and his collaborators.

The Turok theory of particular interest to me is his "CPT symmetric universe" theory, which features our universe going forward and backward in time. This scenario may seem odd, but both these directions are real solutions to Einstein's field equations. The primary concept driving his work (and mine) is symmetry, which is regarded by many to be perhaps the most important and central concept in physics.

A second concept I've stressed is the Planck scale, which is an incredibly small, high-energy region where only the basic constants of nature (c , \hbar , G) determine the show. (Specifically, the speed of light, Planck's constant, and the gravitational constant). It is where quantum mechanics supersedes even Einstein's General Relativity Theory in "basicness."

And finally, there is Heisenberg's Uncertainty Principle, that slippery concept that allows faster than light (FTL) behavior, but only for a very limited amount of time that is determined by \hbar , Planck's constant.

With these basic ingredients, I've created a variant of cosmology that I would normally ascribe to being just a fun learning experience, except that it is producing some results that might be of some merit and interest. Let me elaborate.

My variant uses an interpretation of Dark Matter (DM) and Dark Energy (DE) as simply being FTL (within uncertainty bounds) mirror images of our own, everyday universe's matter and energy. This ansatz actually predicts the correct measured amounts of DM and DE, which is encouraging. It also avoids our seeing "real tachyons" in our classical universe and predicts that the acceleration of our universe is decreasing, which is something that the recent DESI (Dark Energy

Spectral Instrument) is observing (though results are not quite at the 5-sigma level yet.) It also includes “inflation” and the “cosmological constant” automatically in the theory, rather than being pieces “tacked on” independently, as they are currently. There are other positives, but these alone are enough to keep me interested in working more.

Cosmology is an amazingly beautiful, but also amazingly deep field, and while it may be presumptuous for me to be tackling it as a retirement project, there are still enough mysteries left that it is hard to resist taking a crack at it while I have the time!

March 5th Speaker: Dr. Tracy Becker, Southwest Research Institute (SWRI)

Place: Both at the DYHS library and on Zoom (speaker will be remote)

Title: NASA’s Europa Clipper Mission: How the Ocean World Explorer Observed the Interstellar Comet 3I/ATLAS

Abstract: Under the icy shell of Jupiter's moon, Europa, lies a liquid water ocean and the tantalizing question of whether that ocean could be suitable to support life. NASA's Europa Clipper Mission is on its six-year journey to Europa to answer that very question. While in route to the icy moon, the Europa Clipper spacecraft had the serendipitous opportunity to observe the icy interstellar comet 3I/ATLAS as it passed through our Solar System. This presentation will discuss what the Europa Clipper mission is designed to uncover about the mysterious ocean world, Europa, as well as what it has revealed about icy worlds from distant star systems.

Biography: Dr. Tracy Becker is a planetary scientist at the Southwest Research Institute in San Antonio Texas. She specializes in the study of moons, planetary rings, and asteroids. She is the Co-Deputy PI for the Europa-UVS instrument on the Europa Clipper mission, and the Deputy PI for the Alice UV instrument on the New Horizons mission.

Precis: The Europa Clipper (EC) is headed for Europa (obviously), but it has also encountered a comet on its way, Comet 3I/ATLAS, and so Dr. Becker’s talk was about both things – an excess of riches.

As we know, Jupiter has four large “Galilean satellites” (as Galileo saw them first with his small telescope): Ganymede, Europa, Io, and Callisto. These smaller worlds are just as fascinating as their parent planet and are currently being studied

extensively by planetary scientists. (Which *you* also can do to some extent, just with binoculars!)

Tracy's talk started out with the visual spectrum description of Europa. To begin with, it has a high albedo (reflectivity), which suggests an icy surface. When closer examination became possible with the Voyager 2 satellite in 1979 and the Galileo satellite in 1996, the icy surface was apparent, and moreover it was crisscrossed by numerous darker lines and cracks. This suggested material coming from below the surface, such as we see in geysers and volcanoes on earth. Moreover, these features had some further interesting structure. There were "chaotic" blobs of surface darkness seen, as well as very linear features, the latter of which extended up to 1900 km in length and a width of 20 km.

Besides visual electromagnetic (EM) spectrum imaging, satellites can also examine the magnetic field around a world - magnetometers are an old and well-known technology in Earth geophysics. The intense magnetic field from Jupiter has been seen to be perturbed around Europa, indicating an induced magnetic field due to a conductive liquid - water!

The Hubble telescope has also gotten into the mix, and standard spectroscopy has confirmed salty deposits on Europa's surface. Moreover, it saw water plumes being ejected - geysers! This was also confirmed by reanalyzing Galileo data. And as further reinforcement, plumes of material have also been seen to be ejected from Io and Enceladus.

So, the structure of Europa begins to be shown as a layered one, with H₂O ice being the top 15-25 km, H₂O water constituting the next 80-170 km, and the bottom being the rocky core. Given this water layer, the question "is life possible" certainly looms as a big one to answer.

The EC mission is due to arrive at Europa in 2030, and have a four-year mission with 49+ flybys, the closest of which will be just 25 km from the surface at 5 km/hr. The five instrument packages onboard, part of which is SWRI's project, will all be recording remote sensing data simultaneously. These can be examined in some depth on the EC's website.

The oceanographers listening to the talk (and there were a few) were again right at home looking at obtaining T/S/z diagrams (temperature, salinity and depth) - just a little further offshore than usual. Hopefully some of you remember Dr. Wanying Kang's (MIT) talk from last October!

Every so often, nature throws some "bonus data" to an investigator. In the EC's case, this was from the flyby of Comet 3I/ATLAS, which was discovered July

2nd, 2025. The EC was outside the orbit of Mars heading towards Jupiter when it got some good looks of the comet, which was between Earth's orbit and Mars'. There was also the JUICE satellite near Earth looking outward, so there were instruments that could get a good look at both the ion plasma trail and the dust trail of the comet.

The interstellar comet is perhaps seven billion years old, compared to the Solar System's 4.5 billion, so seeing what the compositional differences between the Solar System and interstellar materials is was a great opportunity. The results so far show the same chemical species, but some very different relative abundances. This data is new and still being analyzed, but you know that the investigators are not unhappy with a little more work to do!

This month's speaker:

April 2nd Speaker: Dr. Jacquelynne Milingo, Director of Astronomy, Maria Mitchell Association

Place: Both at the DYHS library and on Zoom (speaker will be live)

Topic: Stewarding the Past, Present, and Future of Astronomy at the Maria Mitchell Association.

Abstract: In this talk I will share my journey to the Maria Mitchell Association (MMA) and my vision for astronomy at MMA including the observatories, the role of our long-standing NSF REU program, our glass plate collection, and engaging different communities in the mission of MMA.

Biography: Dr. Jackie Milingo is an observational astronomer who earned B.S. degrees in Physics and Astronomy from the University of Kansas, and a Ph.D. in Astrophysics from the University of Oklahoma. Dr. Milingo joined the MMA after a year-long AAAS Science and Technology Policy Fellowship at the U.S. National Science Foundation, where she was a Fellow in the Office of Legislative and Public Affairs, as well as the Astronomy Division in the Math and Physical Sciences Directorate. Before her fellowship, she was a professor in the Physics Department at Gettysburg College for over twenty years.

Next month's speaker:

May 7th Speaker: Dr. Keaton Bell, CUNY NY

Topic: White Dwarf Asteroseismology

Date: May 7th, 7:30 PM

Place: Both at the DYHS library and on Zoom (speaker will be remote)

BIO: Assistant Professor Keaton Bell is an observational astronomer who studies the structures of white dwarf stars from their vibrations. Dr. Bell earned his PhD at the University of Texas at Austin, where he observed for over 200 nights on the 2.1-meter telescope at McDonald Observatory, and now he mostly works with video data of the entire sky collected by NASA's Transiting Exoplanet Survey Satellite (TESS). Dr. Bell worked as a postdoc at the Max Planck Institute for Solar System Research in Göttingen, Germany, and was an NSF Astronomy and Astrophysics Postdoctoral Fellow at the University of Washington before joining the faculty of the Queens College Physics Department of the City University of New York (CUNY) in 2022.

Abstract: Queens College astronomer Keaton Bell uses video recordings from space telescopes to measure vibrations of dead stars called white dwarfs. White dwarf stars are the glowing hot embers left over when most stars run out of nuclear fuel. Some white dwarfs vibrate spontaneously, revealing resonant frequencies of the stars that can be used to map their interior structures. This presentation will describe the physics of stellar vibrations by analogy with the physics of musical instruments, which Keaton teaches a course on at Queens College. We will discuss the importance of studying white dwarf stars and review how the QC White Dwarf Research Group studies their structures by interpreting video recordings of vibrating white dwarfs. This talk will explain some of the newest breakthroughs in the field of white dwarf asteroseismology.

June 5th Speaker: TBD

July 2nd Speaker: TBD (Forum/workshop meeting?)

August 6th Speaker: Dr. Antony Stark, HSCfA

Topic: “The tensor-scalar relation at the start of the Big Bang.”

Directions to Dennis Yarmouth HS and Werner 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 along 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. You can (and should) park on the grass there.

Sea Dog restaurant directions (No longer H&K, which recently closed)

CCAS hosts a dinner gathering for the speaker (if available), members and friends on meeting nights (just before the meeting) at the Sea Dog restaurant at 5:30 - 5:45pm; (the meetings begin at 7:30 at D-Y.) Please join the group to dine and talk about all things interesting, especially astronomy, before our meeting. The Sea Dog restaurant is located at 23 White's Path in South Yarmouth. Its phone is 508-694-6020. Chris Lynch has called ahead to confirm this new venue (as the H&K closed recently.)

NOTE: Since Covid, we have a mix of fully remote and hybrid in-person+ remote meetings. Check the newsletter and/or website to see what the format is each month! Sometimes there are no dinners when the meeting is fully remote.