

First Light Lite

August, 2019 Edition

Jim Lynch - Editor

July was neither a very good month for weather, nor for equipment, as far as CCAS activities were concerned. As July 4th was the first Thursday of the month, our speaker (Dr. Larry Marschall) gave his (as usual, excellent!) talk on the second Thursday. That left us the last two Thursdays of July for our star parties. However, as in June, the weather turned nasty on us for the remaining two Thursdays. (Actually, the last Thursday was relatively clear, but in the wake of two Cape Cod tornadoes tearing up Yarmouth and Harwich the day before, we had no choice but to cancel.) We are now in the third month of an extended summer schedule (June through September) of three Thursday star parties per month, and hopefully we will see *some* clearer skies. Working around the Cape's weather this summer has not been very much fun.

The biggest equipment story for summer has been the installation of the new 12 ½" PlaneWave telescope in the WSO dome. From June 3rd on, the CCAF board and other CCAS members worked on getting the new scope set up, and initially, success looked instant. The "first light" picture the scope took, of M13, came out beautifully, with a 30 second unguided exposure giving beautiful, pinpoint stars. But, with instrumentation, even amateur gear (though this is a fairly sophisticated piece of COTS amateur gear), things are never so simple. During installation, the "EFA box" (focuser) was dropped, and it appeared that some of the electronics and/or connectors were damaged. Charlie Burke obtained a new box and hand controller from PlaneWave, and that seemed to fix this hiccup.

Next, we had a large thunderstorm which knocked out power to the dome, which in turn made Charlie and his helpers obtain a new UPS (uninterruptible power supply) good for a few hours, as well as learn how to restore the pointing model files for the PlaneWave system. All this is probably part of the normal learning curve for new gear – things go wrong, and you need to know how to fix them. The next task was to get a Van Slyke "splitter" that could accommodate both a camera and an eyepiece for the scope. This was done, and to quote Charlie

Burke “Looked at mount and balancing. To make process easier, we should install the Van Slyke, one eyepiece and the camera Gary Walker has lent us. This combo would be the heaviest choice for the scope. We can adjust the load along the optical axis so that the motors are not straining when slewing. Later on we can make adjustments with weights as necessary.” This, together with a “users procedure guide” that Charlie Burke is developing, would be the last bits needed before the scope would be available for our star parties.

What else could happen, right? Sigh - as everyone knows, two tornadoes knocked down trees and took out power in the Yarmouth/Harwich area, as well as tearing off a (well-publicized) motel roof. Power to the dome was out for over a day, and the scope then seemed to develop additional “issues.” Charlie Burke and others are working with PlaneWave to fix these latest issues, and we’re pretty sure we have the “fix” outlined. But at two months and counting from the original installation, things are not the “instant success” we hoped for.

Until the dome scope is fixed, the situation re star parties is that we will have plenty of outdoor scopes (large and small) and our binocular tour available, so if the weather actually cooperates, we are still very much in business. The dome scope is most needed in the winter, so we have some leeway there. We’ll keep everyone posted! And a big thanks to Charlie Burke et al for their concentrated efforts to get this reluctant beastie up and running!

One important administrative detail. Dues were formally due in July, and are still a low \$30 for a family, \$15 for college students and part time residents, and free for HS students. As we are transitioning to a new treasurer, Dr. Ken Brink, we are a bit slow on following up with collecting dues (the treasurer transition takes a bit of time), but we will continue doing so over the next few weeks. We have been putting our dues money to very good use for equipment and outreach, and we hope that people will be willing to either start or continue as paying members of CCAS to support these efforts. You can bring checks (made to CCAS) or cash to the meeting, or send checks via snail mail to:

Dennis Yarmouth School District
Maintenance Department

Attn: Werner Schmidt Observatory
296 Station Ave
South Yarmouth, MA 02664

Before getting to our “Upcoming Speakers” part of the newsletter, let me just thank again the many wonderful guest speakers who have come here, and who have agreed to come here in the future. CCAS has enjoyed a first-rate lecture program throughout the years, with many prominent, working professional astronomers and astrophysicists coming here to give public talks. We are privileged to have them visit, and we hope that they will still want to come here to the Cape in the future, despite the sharks and tornadoes! We are an appreciative audience!

Upcoming Speakers

August 1st

**Dr. Antony Stark, Senior Astronomer
Center for Astrophysics | Harvard & Smithsonian**

"Imaging Black Holes"

In May I (JFL) talked up the book “Einstein’s Monsters” by Chris Impey, which gives a very nice history of the VLBI (very long baseline interferometry) project to image a black hole. Another one of our favorite speakers, Dr. Tony Stark of HSCfA, was part of the South Pole Telescope group that manned that key instrument in the global VLBI array. He happily surprised me with an email saying that he would like to give a talk on that topic in August. (He also noted he was one of the *370 authors* on some of the initial papers that reported the now famous image.)

For those who would like to see the initial papers published about this famous event, please visit the Event Horizon Telescope website at:

<https://eventhorizontelescope.org/> . On the site, you will see:

“This research was presented in a series of six papers published today in a special issue of *The Astrophysical Journal Letters*, along with a [Focus Issue](#) that

summarizes the published studies. Individual papers can be accessed without any charges via the following links:

- Paper I: [The Shadow of the Supermassive Black Hole](#)
- Paper II: [Array and Instrumentation](#)
- Paper III: [Data processing and Calibration](#)
- Paper IV: [Imaging the Central Supermassive Black Hole](#)
- Paper V: [Physical Origin of the Asymmetric Ring](#)
- Paper VI: [The Shadow and Mass of the Central Black Hole](#) “

Tony Stark’s abstract for Thursday, August 1, is as follows:

ABSTRACT: We have now made the first image of a Black Hole, using a world-spanning radio telescope acting as an interferometer. Future images will yield moving pictures that bring new understanding of Black Hole event horizons. The redshift at the event horizon is infinite --- this is an example of an actual infinity in Nature. The nature of the event horizon is under intense theoretical study. Is it cold? Is it ultra-hot? What happens when you cross the threshold? What happens to things, people, and information that fall in?

September 5th

Dr. David Wilner
Associate Director
Radio and Geoastronomy Division
Center for Astrophysics | Harvard & Smithsonian

Title: New Eyes on Planet Formation

Abstract: To understand where the Earth comes from, we have to look beyond what's visible to the human eye. Using radio telescopes, we can now "see" directly the raw material for new planets orbiting around young stars and probe the process of planet formation in action. This talk will introduce some basic ideas and open questions about planet formation, from properties of our own Solar System that you can deduce from your own backyard to the latest advances from giant new radio telescopes, in particular new high resolution images from the international Atacama Large Millimeter Array (ALMA) of 66 precision antennas located at 16,500 feet altitude in northern Chile.

October – TBA

November – Dr. Mark Reid, HSCfA

December – TBA

Last Month's Speaker

Dr. Larry Marschall

Professor of Physics, Emeritus, Gettysburg College.

“ON BEYOND PLUTO”

Abstract: On New Year's Day, 2019, the New Horizons Spacecraft achieved a rendezvous with 2014 MU69, the most distant object in our solar system ever visited by a spacecraft. Three and a half years earlier, in July 2015, New Horizons made its closest approach to Pluto, sending back striking and informative closeup views of that distant dwarf planet. 2014 MU69 lies beyond Pluto, in a region of our solar system called the Kuiper Belt, and because of its immense distance, practically nothing is known about it. In this presentation, we will show some of the first glimpses of this previously unexplored region of space. Based on our experience with New Horizon's first views of Pluto, we expected many surprises, and there were----but there were also some remarkable confirmations of predictions. We'll discuss these both---data is still coming down from the distant spacecraft, and it won't all be downloaded until next year.

As many know, Dr. Marschall is an old friend of CCAS, noted for giving crystal clear talks with wonderful graphics. In his latest talk, Larry gave a fascinating introduction to the history and basic physics of the Kuiper Belt, which has become fairly notorious since Pluto was “demoted” to be one of its numerous inhabitants. The New Horizons mission first toured by Pluto, and Larry gave us an update on where that amazing bit of data collection and science lies. The now well-known images of Pluto both answered many questions and raised many more. But, as the NH vehicle still had some fuel and maneuvering capability left, the mission scientists decided to go for more, and so searched for yet another KBO (Kuiper

Belt Object) that was “close enough” to the vehicle’s trajectory past Pluto. An object was found, its orbit determined, and New Horizons steered to the rendezvous. The attempt succeeded brilliantly, and we now have some great images of some of the Solar System’s “least disturbed”, primordial material to look at. More images are incoming this year, as the data rate for transmitting these pictures is quite slow!

July Meeting Minutes and CCAS Business

The July CCAS business meeting pretty much played the same tunes as previous meetings, with the telescope having the biggest part, but with our yearly officer election and envisioned dome automation also being prominent.

As the telescope story was discussed in the beginning of this newsletter, we will not belabor it further here.

The CCAS yearly elections were held as per our usual schedule at the July meeting. The (unanimously) elected CCAS officers for the coming year are: Jim Lynch (President), Ashish Dutta (Vice-President), Ken Brink (Treasurer) and Katie Sisson (Secretary). We wish to heartily thank Mike Hunter for his previous service as CCAS Treasurer. CCAS also elects CCAF board members, and at the meeting, Gary Walker was unanimously elected to fill the open slot on the CCAF board.

With the officer elections over, we also discussed dues collection and membership. Dues collection was discussed above, and as for membership, this will be a high priority item for the next CCAS Officer’s meeting.

One addendum to the “new telescope installation saga” is that we have also gotten quotes for automating the dome for remote viewing. The (rough, conservative) bottom line is \$9-15K to do this. However, some partial work could be done quickly for smaller, initial funds. This would be a game changer for us, in that we would have a LOT more observation time available (read: any clear periods!), we could accommodate some of our more distant members (and there are a number all over the Cape), and the students would not be so restricted in their project work

times. Janice Marks and Chris Lynch have signed up to do some development work to try to get funds for this initiative, some “ideas” memos have been circulated, and we will be posting more in the near future. Getting the new telescope up and running is the first step, and now that we are (hopefully!!!) nearing completion on that, we can start moving even further.

Star Parties

After September until mid-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 mid-June through September, 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 October, 2019; **the public is cordially invited:**

August 8th, 22nd, and 29th

September 12th, 19th, and 26th

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 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

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).