

First Light Lite

September 1, 2021

Jim Lynch – Editor

Message from the CCAS President

Every so often, the light at the end of the tunnel is, in fact, a train. The Delta Express seems have roared down the tracks this summer, and like it or not, we have to watch it Zoom by. (Hmmm, maybe a bad choice of verbs there...)

But, even if slower than wished, we are still making progress towards getting back to normal. I'll provide the latest details below. Let me please warn you that there is a wee bit of redundancy in text from last month, but not total – the substantial new text reflects the changes (and progress!)

1) Committees

The committees which we formed this February are working! Our committee meetings are now being held together as a group via Zoom the third Tuesday of every month (with slight departures to line up with our CCAF foundation meetings) and are posted on our website. Agendas and links will be sent to committee members beforehand. We still have room for anyone interested! (Only an hour-long meeting!)

To refresh people's memories of what the committee's and their charters were, in a very brief form:

a) Membership/Outreach – Recruiting new members Cape-wide, and making links to schools, organizations and clubs both on-Cape and off. We will actively recruit more people outside of our mailing list, i.e. the general public, when we can meet with them in person at star parties and activities, which **are being planned for fall (see below)**.

b) Programs/Content – Star party organization, special events, school program offerings, offerings for club members.

c) Communications – Website, videos/podcasts, advertising of events and programs.

d) Speaker Program – Finding invited speakers for CCAS meetings and also tracking other interesting talks that club members can access.

2) Ramping Up Our Activities (latest Plan B update)

As often stated, over the past (almost) year and a half we have been working from Plan B, rather than having clear-cut directions to follow. We managed to keep our lecture series going, thanks to Zoom and some very generous speakers, but our star parties vanished (with the exception of some gracious, intermittent invitations to George Silvis' personal observatory via Zoom.) Our school efforts were limited to our "book give-away" program linked to the monthly Zoom lectures. These Plan B initiatives kept us going, but it has been at the expense of personal interactions.

With the vaccines now being available, and a large amount of people on the Cape being vaccinated, things have improved somewhat, though not quite 100%. But, we'll take the improvements that are available, as these are progress!

Lecture series

We have some excellent speakers lined up through December (see below), and more that we are contacting, so that finding good – no, make that *great* - speakers is not the problem. But getting back to live lectures is still the uncertain piece. We have traditionally had our talks at the Dennis-Yarmouth HS library, with occasional forays to the Falmouth Public Library, but the delta variant of covid is making facility administrators reconsider their opening plans, and so we won't consider "going live" until early next year at the soonest. We *will* announce the lectures via the website and in this newsletter, so look at those for the latest information. We are also looking at recording our lectures in the future and posting them on our website.

Also, please note that, due to a change in scheduling, this month's CCAS lecture will be on September 16th, at 7:00 Eastern. We very rarely deviate from our First Thursday tradition but will do so when we need to.

Star Parties

Our WSO star parties were shut down for a year and a half during the pandemic, but it appears we are now back in business! We just have been notified by the DY Regional School District that we will be able to host events at the Werner Schmidt Observatory (WSO) on the DYHS campus grounds come September, and indeed we have planned dates for star parties, which will be posted in this newsletter and on the CCAS website.

The star parties will be of a somewhat changed nature, however. Due to the delta variant hanging around, these events will be strictly outside (so dress warmly!) and will be a combination of “electronically assisted astronomy” and “binocular astronomy.” Between the two, and some docent style lectures by club members, we can still show you the stars and planets, with the power of our main 12” telescope in the dome, some smaller scopes deployed outside, and binoculars, which often give the best view of wide field objects. These methods allow great views, but will also keep you safe, as there will be no common touching of equipment and no indoors exposure.

Let me elaborate on that last paragraph. “Electronically assisted astronomy” (EAA) is a fancy phrase for stacking electronic camera images (most usually taken through a telescope) in real time. It produces some spectacular images when used correctly, and indeed we showed some from our 12” scope in a past issue of our newsletter. We only needed to cable the images to a TV monitor outdoors to be ready for this for our dome scope, and we have tested this system and it is working.

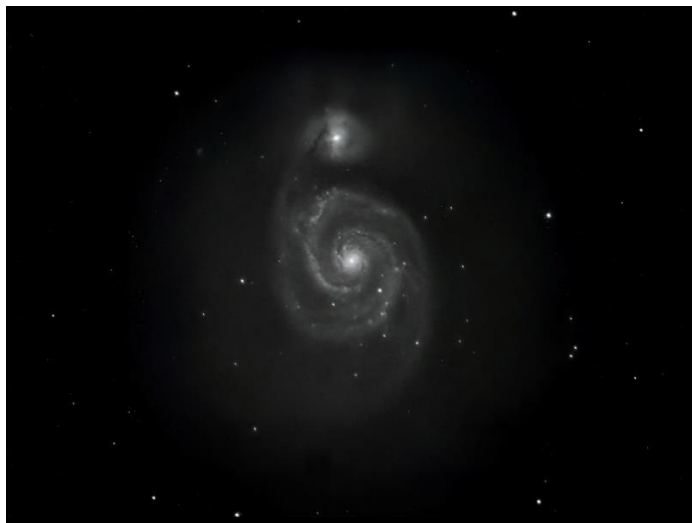


Fig. 1. Image of the M51 "Whirlpool Galaxy" made in two minutes using "EAA," i.e. quick stacking of images, from the 12" Planewave telescope at WSO. The hazy "fuzz" surrounding the image is the result of doing quick processing, as opposed to the more careful processing that one does to make very high quality astro-images.

As to using this technique with smaller scopes, there are also some advantages, as smaller apertures see a wider field of view, and many night sky objects are quite large in extent. Small scopes, combined with the great amplification that CCD and CMOS cameras give, and combined with stacking gain, can show some of these wider features. (The Veil Nebula in Cygnus, an older supernova remnant, is one object that is currently prominent in the night sky, for example.) We are adapting the same software that we use in the larger scopes to our smaller ones, and should have this ready by October. I should mention that our impetus to do this with small scopes came from an excellent talk by Mark Johnson from the Phoenix Astronomical Society on July 15th.

"Binocular astronomy" is a well-established part of amateur astronomy these days and gives a very visceral view of the sky. It doesn't have the amplification that EAA has, but there are many bright objects in the sky, and for anyone wanting to get a feel for our Northern Hemisphere night sky and how it changes with the seasons, it is the first order thing to do.

With EAA, widescreen TV monitors will be placed outdoors, and so one can just look, listen, and ask questions. For binocular astronomy, we have a number of pairs of "loaners" that can be given to a family group, but we can't allow common distribution of a pair or two as we did in the past. We'd ask that people "BYOB" (bring your own binoculars) if they have a pair available. We also will have posted safety rules, as dictated by the state and town, which we all must follow. We don't like being restricted any more than anyone else, but safety has to be the first consideration.

School Projects and Activities

At this point in time, we are discussing with the local schools (DYHS, BHS, Sturgis) what is possible and what is not this fall. We have some very interesting projects available, and hope that we can work with the students on them soon. Given the delta variant, it appears that whatever interaction occurs will be over

Zoom, but at this point all of us are very used to doing that. (And we *always* have projects available for members to try, which we are updating on our website!)

And of course, our astronomy book give-away for the students will continue this fall, as a component of our lecture series.

3) Day of Astronomy

Given permission for outside events at WSO, we are planning a Day of Astronomy event at the Werner Schmidt Observatory (WSO) for the public and our club members and friends. We originally had posted September 18th, but given some delays that we have encountered, it is looking more like sometime in October. The date will be posted prominently when we have a final decision.

During the day, we will have live demonstrations, talks, and many great astronomy-based items to give to our visitors, including books, globes, posters, and a raffle of a four-inch telescope with an equatorial mount. In the evening, we will have a star party, and continue our give-away program for our guests. In between the day and evening activities, we will be going to dinner at a local restaurant, and invite people to join us, but only if they are vaccinated and comfortable with indoor dining. (Right now, our tentative schedule is: afternoon program 2-5 PM, dinner 5-7 PM, and evening star party 7-10 PM.) We will also be doing a membership drive, and hope that some of our visitors will be interested in joining when they see what we do. We hope to see you at WSO!

4) Website

If you look at it later this week (Friday or Saturday) you will see the following updates: 1) an updated introduction by the CCAS President, 2) an updated calendar, with speakers and their topics included, 3) a complete list of this year's and previous year's speakers (back to January 2017) and their topics, and 4) this year's and previous year's FLL newsletters. Our apologies for the delay in updating.

Speakers

Last Month's Speaker

Dr. Antony Stark, Harvard Smithsonian Center for Astrophysics

“The CMB-S4 Experiment”

Tony Stark has been very generous in giving talks to CCAS, and last month he again lent a hand, filling in for a speaker who had to reschedule. Tony's talk (which he has kindly provided us with the PowerPoint to, attached) filled us in on his latest efforts in probing the Cosmic Microwave Background (CMB) radiation, as part of the CMB-S4 collaboration.

In that Tony's PPT slides have a wealth of information, I will just throw in a few “peanut gallery” comments here, rather than repeat things unnecessarily.

I think that club members are all somewhat familiar with how the COBE, WMAP, and Planck satellites revolutionized CMB studies, each with increasing resolution. And, for those who have followed Tony's work, there are also Earth-based microwave telescopes scanning the sky, such as the South Pole Telescope (SPT) and the Atacama Large Millimeter/submillimeter Array (ALMA). Tony uses these as part of the CMB-S4 collaboration, braving both the cold and thin atmospheres. The CMB-S4 collaboration is described on their website (cmb-s4.org) thusly: “With 21 telescopes at the South Pole and in the Chilean Atacama desert surveying the sky with over 500,000 cryogenically-cooled superconducting detectors for 7 years, CMB-S4 will deliver transformative discoveries in fundamental physics, cosmology, astrophysics, and astronomy.” This is a large, multi-investigator collaboration with a budget that puts it in the same league as the gravitational wave detector efforts. Not exactly small science!

I won't go into the details of Tony's slides, other than to say that they are very detailed and informative, and well worth scanning through. If you are not familiar with some of the words or concepts, make a list and go through it! At the end, you will be familiar with many the forefront topics of modern astronomy and astrophysics. And please visit the [cmb-s4](http://cmb-s4.org) website as well!

This Month's Speakers (Zoom)

September 2nd, 2021

Special Phoenix Astronomical Society invitation (with our thanks to Paul Facuna and PAS)

The Phoenix Astronomical Society is meeting on Thursday September 2, 2021. The speaker is Anna Engle, a graduate student at Northern Arizona University. Her topic is "The Moon of Saturn: Titan." The Cape Cod Astronomical Society is invited to attend the meeting. An intro is as follows:

“Anna Engle is a third year PhD student in the Astronomy & Planetary Science program at Northern Arizona University. She works in the [Astrophysical Materials Lab](#) with Dr. Jennifer Hanley (Lowell Observatory, NAU Dept. of Astronomy and Planetary Science) primarily focusing on the interactions of hydrocarbons in Titan's lakes. She was awarded the 2020 NASA FINESST Fellowship for the proposal titled "*Experimental Studies to Determine the Impact of Propane, Acetylene, and Ethylene In and Around Titan's Lakes*", which she will be working on for the next three years. She is also fascinated by Pluto's Sputnik Planitia region and has also begun work on a side project that involves exploring the delamination sites at the interfaces of electrodes and polymer electrolytes in supercapacitors. When she is not in the lab or office, she enjoys [making art](#), cooking, running, bouldering, and exploring Arizona and the southwest.”

Virtual log-in starts about 7 pm (PDT). The meeting begins at 7:30 pm (PDT) after a brief introduction. The link to log into the Zoom meeting is:

<https://us02web.zoom.us/j/86256016995?pwd=aURYc2RtZzg1NDZvaUR0Y3hGaVVzQT09>

NOTE: Login for the PAS meeting begins about 10:00 PM **EDT** with the meeting beginning at **10:30 PM EDT**.

BTW, if you are not on our CCAS “Zoom login” distribution list, and wish to be, contact Jim Lynch at jlynch@whoi.edu. Our usual CCAS talk links come via that link.

September 16th, 2021

Dr. Jim Lynch, CCAS and WHOI

Due to a change in scheduling, Jim Lynch will fill in as speaker this month. His topic is “An Introduction to CCAS and Amateur Astronomy.” He will make sure that his talk does not tread on our November speaker’s (Dr. Dan Davis) specific topics on a similar subject! And our book give-away for students WILL begin with this month’s talk!

Future Speakers (Zoom)

October 7th, 2021

Dr. Jim Head, Brown University

Dr. Jim Head of Brown University, who has given us two excellent talks on Lunar Exploration and the Chinese Space Program, has offered to talk this October about the latest news from Mars, which should be very exciting. Perseverance and a number of other rovers and orbiting craft are making Mars a busy place these days, and there should be plenty to relate and synthesize!

November 4th, 2021

Dr. Daniel Davis, Stony Brook University

Dr. Daniel Davis of Stony Brook University, the co-author with Brother Guy Consolmagno of “Turn Left at Orion,” will give the November talk on “hands on” astronomy projects for amateurs. We will have signed copies of his book to distribute to students, and we hope they will be interested in some of the things that amateurs can see and do!

December 2nd, 2021

Dr. Delilah Gates, Princeton University,

Our Guest Speaker in March, Dr. Jim Gates, mentioned in passing and with more than a slight hint of pride, that his daughter Delihlah was finishing her PhD work in General Relativity (Black Holes) at Harvard this last spring, Being a shameless opportunist, I cadged the link to her thesis defense and also asked her if she would be interested in giving a talk to our club. Happily, she agreed and her abstract is below. We were hoping that we would be able to have this as a “live” event, but as mentioned, the facilities we use weren’t planning to open until September (and even that is uncertain now.)

Her topic should ring a bell with our members, in that Dr. Tony Stark gave a talk about the Event Horizon Telescope and its images when they first were disclosed to the public. The effort to extract information from these images about black holes and their environs has been ongoing since their appearance (and actually before), and Dr. Gates will provide us with some insight into how that effort is going!

Title: Observational Signatures of Black Holes: Learning from Light?

Abstract: Black holes are a prediction of Einstein's theory of general relativity and are the most extreme gravity regions of our universe. With experiments like the Event Horizon Telescope, imaging black holes has transformed from science fiction to science fact. What can we learn about black holes from imaging the light that bends around them? What signatures in black hole images tell us how big they are and how fast they rotate?

Spring/Summer 2022

Dr. Alyssa Goodman of Harvard University, whose work on the "Radcliffe Wave" discovery has been prominent in the news, has also agreed to talk to CCAS this coming year. We had promised Dr. Goodman some direct contact with the local students, but until the delta variant is under control, that is not yet possible. Her exact topic/title is TBD.

Star Parties

We are again posting our “usual information” as well as an event schedule, but please note that given the resurgence of the pandemic via the delta variant, these dates and plans may change. Please see the website for up-to date information.

Star Party Dates:

September No star parties scheduled – still setting up our “modified format!”

Oct 4,30;

Nov 6, 27;

Dec 4, 11.

Information:

A Star Party is a scheduled event “at the WSO Dome” usually starting at 7:30pm in the fall, winter, and spring (8:30 in the summer because the sun sets later.) Our EAA setup will be available for ~2-4 hours from when the sun sets.

Not just telescopes will be available: a CCAS member who knows the groupings of stars in the night sky (constellations) and how those move with season and time, will point to various stars, planets, and constellations with a laser pointer, describe what is being pointed out, and invite binocular observation.

When at our website, please click on: " Meetings & Events" on the Home Page and then, ...for Schedule of Meetings and Star Parties and anything else scheduled, click on " Calendar". If you need to see a month later than the current month, click on the arrow pointing to the right... to see more info on each item in the calendar, click on each item.

If you can, please visit the calendar at our website once a month to track us “opening back up to normal,” especially as we start scheduling Star Parties again.

If in doubt about the weather, call 508-398-4765 15 minutes or less before the event starts – no answer means the event has been cancelled. Cancellations may also be reflected on the calendar.

All our scheduled Star Parties are free of charge and open to the public. One of the main missions of CCAS is to invite folks to enjoy the night sky and learn something about it.

For more info about The Schmidt Observatory click on " Observatory" from the home page and look thru the items listed, particularly "Mission" and "Facility." At "Facility," please click on the underlined "Werner Schmidt Observatory" at the top of the page to go to a map showing the location of the observatory behind Dennis-Yarmouth High School.

Directions:

To get to a WSO Star Party, exit from the Mid-Cape Highway, Rt 6, at Exit 8 and turn left (toward the south) at the end of the ramp. Drive down Station Avenue a mile or so, and, when you reach it, on the left, drive into the northernmost road leading onto the Dennis-Yarmouth High School campus. Then go all the way thru the gate until you see the Dome and parking spots. Don't worry about a sign on the fence near the open gate which suggests "authorized" folks only. If the Dome is open, you are authorized.

To get to the Library at Dennis-Yarmouth Regional High School where our monthly meetings are usually held (again, check for updates), drive into the southernmost road leading onto the campus, drive along the football field until you can turn left behind the main HS building, and park near and go into the first "back door" you can see. Directions to the Library are posted in the hallways when we have meetings there.