

First Light Lite

August 2, 2020

Jim Lynch – Editor

Message from the CCAS President

First off, I hope that all of you reading this are well and are staying as safe as possible. We on Cape Cod and in MA have now been living for over four months with the novel coronavirus, and our lives and activities have been pretty thoroughly disrupted. CCAS is no exception to this. And it appears that we will have to live with such disruption for a while longer. So, the question is: how do we adapt to the limiting circumstances we find ourselves in?

As you've seen, we've halted our in-person activities until we can operate them safely, and we've gone to the "virtual world" wherever we can. While we are all undoubtedly a bit tired of this virtual universe after a few months, it still does keep us in touch and our programs operating on some level. And I, for one, am an optimist that we can ramp back up to pre-pandemic levels once safety is again assured.

The current status of our three main activities, i.e. lectures/meetings, star parties, and interactions with DYHS and other Cape schools is as follows:

Re lectures, we are actually in pretty good shape. We have some wonderful scientists lined up to speak with our club over GoToMeeting this summer and fall, and I will be describing last month's and this month's talks in this letter.

As regards star parties, club member George Silvis has made his private observatory a star party Zoom broadcast site on an "as available" basis to people who sign up with him. If you are not yet part of this group and are interested, you can ask George for an invitation via me at jlynch@whoi.edu. The group is called "Mashnee Virtual Observers", and again we thank George for this individual effort.

We also would like to have virtual star parties delivered via webcam and GoToMeeting (a Zoom equivalent) from the Werner Schmidt Observatory (WSO), but this effort is pending negotiations with the school district on reopening the facility. We will keep our membership informed as to the status of this effort.

Regarding our educational/mentoring interaction with DYHS and other schools on the Cape, we are again in the discussion phase. It has been exceedingly difficult for the schools to determine how things will play out in the fall, and we are dependent upon their decisions before we can plan our own activities. Again, I will try to keep you all informed as things develop.

Werner Schmidt

Werner Schmidt's son Paul generously donated an assortment of amateur astronomy gear to CCAF/CCAS and radio amateur gear to a local ham group we contacted. We thank Paul and his family (and in memoriam, Werner) for this generous contribution, which will certainly be put to good use. Werner, his family, and his estate have been exceedingly generous in supporting CCAS/CCAF.

It is hoped that we can hold a memorial service for Werner at the WSO in the not-too-distant future. But, as with everything, exactly when will depend upon how the virus affects any gatherings.

Officer and Trustee Election (July 2nd Meeting)

The current officers of CCAS successfully stood for their offices (President, Vice President, Secretary, Treasurer) and Mike Hunter was elected as CCAF Trustee (the Secretary position). Thanks to all of these people for their continuing service to our club.

Invitations to our virtual meetings

To date, we have been inviting people to the CCAS virtual meetings (via providing a link and a password through email the morning of the meeting) using a recent members list, and also by creating a list of people on this FLL mailing list who have contacted me (at jlynch@whoi.edu) stating that they wanted to log into

the meetings. The offer to be put on our “meeting login list” remains open, and anyone who is interested, but has not received a previous invitation only needs to contact me and express interest. We have some excellent speakers enlisted for the entire rest of the year, and plenty of room in our virtual lecture hall for a bigger audience! Please consider this offer!

Miscellaneous talks and resources

I would like to remind people that there are many other organizations that offer excellent Zoom seminars to the public. Check the latest listings of (for example): the American Association of Variable Star Observers (AAVSO), the Maria Mitchell Observatory, and the Harvard Smithsonian Center for Astrophysics. These, and other programs, have very interesting web-based talks available.

Also, I will be giving a series of four weekly talks on amateur astronomy in October via the Falmouth Library’s “Joy of Learning” series, which I will make sure can be available to our club.

Binoculars

And finally, despite there currently not being “in person” CCAS star parties where we can make telescopes and laser pointer sky tours available to the public, there is a LOT you can see in summer and fall by yourself with an inexpensive, standard pair of binoculars and a simple star chart that shows the constellations and the “Messier Objects.” The latter are bright and easy to see astronomical objects, and the summer sky has many of them to offer, especially around the Milky Way.

As one (non-Messier object) example, the recent comet Neowise was very visible and impressive through binoculars, even in well-lit areas, and not very hard to find, being just below the bowl of the Big Dipper. (A beautiful DSLR image of it, taken by CCAS senior members Hank and Mary Lou Ricci, is shown below.) Also, Jupiter is very bright in the evening sky right now, and its four moons are easy to spot with binoculars (and to see change positions over only a few hours!) And there is always the moon, which soon will be full.



Some hints for using binoculars: 1) they can “jitter” the image a lot unless you brace them, preferably against something solid, 2) they can get heavy in your hands after a while, especially bigger pairs, and 3) if you are looking high in the sky, get a reclining patio chair or similar to lay down in! You will have little or no success looking up past 45 degrees otherwise!

Last month’s speaker

July 2nd, 2020

Speaker: Brother Guy Consolmagno, Director Vatican Observatory

**Topic: “Discarded Images: Astronomical Ideas That Were Almost Correct”
(an update of his 2014 Sagan Medal talk)**

Before doing the usual “recap” of the talk (below), let me reiterate the background from last month’s FLL issue, as I think it is very interesting and if you missed it, you should give it (and the links) a glance.

I suspect many people are familiar with Brother Consolmagno’s book “Turn Left at Orion,” which he co-authored with Dan Davis. In addition to his prolific public writings, Brother Consolmagno is well known for his research into asteroids and meteorites. Brother Consolmagno is Director of the Vatican Observatory, and his friend and CCAS member Marinna Martini has supplied this link to his CV: <http://www.vaticanobservatory.va/content/specolavaticana/en/who-are-we-/staff/guy-j--consolmagno--s-j---1-.html>

Abstract: Astronomy is more than just observing; it's making sense of those observations. A good theorist needs to blend a knowledge of what's been observed, with a good imagination... and no fear of being wrong. Ptolemy in ancient Rome, the medieval bishops Oresme and Cusa, the 19th century astronomers Schiaparelli and Pickering, all rose to the challenge; and they were all *almost* correct. Which is to say, they were wrong... sometimes hilariously, sometimes heartbreakingly so. What lessons can we take from these discarded images of the universe?

Recap of talk

Recaps are always pale reflections of the talks given, but if you weren't there, they at least give an idea of what interesting topics were discussed in a talk. So, without further apology, here goes!

The tone of Brother Guy’s talk was set by a C.S.Lewis quote (about his book, *Discarded Images*): “Few constructions of the imagination seem to me to have combined splendour, sobriety, and coherence in the same degree. It is possible that some readers have long been itching to remind me that it had a serious defect: it wasn’t true.” This “beautiful, but alas untrue, science” theme rang throughout the talk.

The starting point, naturally, was “ancient cosmology”, which had a rather good excuse for getting some things wrong (lack of appropriate data), though it did also get an amazing amount right. The peculiarities of the “heavenly spheres” and

the theological explanation of how the term “high seas” came about were my personal favorites.

The Middle Ages comes next, with a lovely 1377 quote from Bishop Oresme: “Reason alone cannot rule out the possibility of the earth spinning and the stars holding still. Nevertheless, everyone holds that the heavens move and the earth stands still; and so do I.” The oceanographers/geophysical fluid dynamicists in the audience certainly enjoyed that quote.

No “history of astronomy” talk is complete without mention of Galileo. His observation of the crescent phases of Venus (shown nicely together with the Moon), pretty much proved the case for the Copernican view of the Solar System. Yet even around the same time, Tycho Brahe, the foremost observational astronomer of the day, still clung to an “epicycle” picture of the Earth’s orbit. Tycho’s failure to find any stellar parallaxes convinced him, and even the great scientist Robert Hooke, that the Earth could be regarded as standing still. Of course, the few arc seconds of accuracy that Tycho worked at, while great for his day, were no near close to the very small stellar parallaxes that exist in nature. His observations were just not good enough! And the old Ptolemaic view died hard.

Another interesting misinterpretation was by Galileo himself. Taking the diameter of a star to be indicated by its disc size in a telescope image, he calculated (with perfectly good math) that “the distance of a fixed star of the sixth magnitude is 2,150 radii of the earth’s orbit.” Of course, the kicker here is that what he was looking at was actually the Airy disc (diffraction image) of the star, which has little to do with its actual size. But, until physical optics was developed, his interpretation was a very natural one, if wrong.

There was more discussion of the mischief that the lack of parallax measurements created, but I will move past that (also very entertaining) segment for now. All I will do here is unreservedly recommend the book “Parallax” by Alan Hirshfeld to you. It is an excellent read (and also was discussed at one of our talks last year!)

Bode’s Law of course got some play, but that’s an “oldy but goody” to this group.

Giovanni Schiaparelli of course comes up in any discussions of misinterpretations, his most famous being the Martian “canali” (canals). As planets often fade in and out during periods of good and bad seeing, Schiaparelli thought he saw, in the instruments of his day, distinct lines linking major areas, which he

interpreted as canals. This in turn gave rise to a booming science fiction industry years later (of which I was a major consumer). But, as later, less romantic data showed: (loud buzzer goes off...) WRONG.

Another mistake Schiaparelli made, this time based on pretty good math, was about the period of rotation of Mercury. Mercury could only be observed well at certain times, which unfortunately were at a multiple of its rotation period. It is now known that Mercury spins three times on its axis for every two revolutions around the sun. However, if the observations are only made at certain times during an orbital period, a well-known signal processing phenomenon called “aliasing” can occur, and Schiaparelli fell prey to it. This is pretty darn forgivable, but again shows how even perfectly good (but inadequate) data can lead you astray.

The last part of the talk involved how a young MIT Master’s student (Brother Guy) deduced, along with others, that there was an ice-covered ocean of liquid on Europa that could possibly support life. At the time, the immortal Carl Sagan shied away from thinking that life could exist in a cold, dark ocean covered by a thick layer of ice – after all, doesn’t life need light energy to exist? But years later, a Woods Hole colleague of many of us, Bob Ballard, discovered the deep ocean hydrothermal vents, and that life could thrive on just heat and chemical energy. Something that was hard to imagine beforehand became real, and our knowledge of planetary physics and formation, combined with an unexpected observation on earth gave a big boost to a brand new field – exobiology.

Like many a good story, Brother Guy’s had a moral at the end. If he doesn’t mind me directly quoting his next-to-last slide, “Science makes mistakes, but it also corrects them. You learn from your mistakes (if you’re good). Often the mistakes are not in your data...but in your imagination!”

Next speaker (August)

August 6th, 2020

Speaker: Dr. Antony Stark, Senior Astronomer HSCfA

Topic: Astronomy Can Save Your Life: The Search for Near-Earth Objects

One of our favorite speakers over the past few years is Dr. Tony Stark, who has given great talks on topics such as “Cosmology With the South Pole Telescope,” “Imaging Black Holes”, “The Cosmic Background”, and “Star Formation in the Milky Way and Beyond.” While Tony is lamenting not being able to stop down at the Cape for a summer vacation for the first time in 25 years, he is still agreeable to giving a remote talk, and we very much look forward to hearing of his latest adventures.

Abstract: There's a lot of stuff floating around in the Solar System, and occasionally some of it crashes into the Earth. People worry about the dinosaur-killer events, but those only happen every 100,000,000 years or so. Much more common --- once a decade? ---are the city-killer sized events like the near-miss Chelyabinsk meteor. These 20-meter sized asteroids can now be detected and tracked, although current instrumentation has limitations and is still somewhat hit-or-miss. The same instrumentation network also detected the weird interstellar "asteroid" Oumuamua.