CAPE FEAR Skies
Monthly Newsletter
Cape Fear Astronomical Society
Serving Wilmington, NC and Surrounding Areas
Cape Fear Astronomical Society is a tax-exempt organization under Section 501(c)(3) of the Internal Revenue Code.
December 2020

President's Message

by Jon Stewart-Taylor

It has been a busy year for Cape Fear Astro. Despite the severe restrictions imposed by the pandemic, we have:

- ★ Continued to meet (even if virtually).
- ★ Accomplished some important goals for the organization and support of the club.
- ★ Managed to hold in-person observing sessions safely.
- ★ Are in position to move into the new year with goals and plans to make 2021 even better.

Our last meetings in 2020 are planned for the same day, December 13. Because the Constitution requires us to vote for officers and for constitutional changes at an in-person meeting, we will be meeting at 3 o'clock at the grounds of the battleship North Carolina. Because we must have a quorum of the membership, at least 10 members must come to the battleship grounds for the voting.

Later that evening (at our usual 7 o'clock time) we will hold our last general meeting of the year. This will be our annual meeting at which we look both back and forward. There is more about the annual meeting in another article in this newsletter.

Although the pandemic will continue at least for the first quarter of next year (and possibly as much as a half year) we can put ourselves in a position to move strongly once the restrictions are reduced. I would like to see this include more outreach to the public and being more welcoming to new members. These and similar ideas will be topics during the annual meeting.

Thanks to all members who stuck with us through this difficult year, and who will carry us forward into the new year.

Due to the COVID-19 virus pandemic, we are now under "safer-at-home phase 2" orders. No CFAstro public events are planned. Meetings will be via Zoom. Member observing as noted, with "social distancing".

December 2020

Date – Event – Time

04 Club Observing; 05:30 PM; TBD

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08 Last Quarter Moon; 12:37 AM UTC

11 Club Observing at Starfields; Shiloh Road Ivanhoe NC; 05:30 PM

12 Club Observing at Starfields; Shiloh Road Ivanhoe NC; 05:30 PM

13 Geminid meteors; ZHR 120; peak Dec 13 18h; 1 day before New Moon

13 Cape Fear Astro Elections; In-Person Voting; 03:00 PM; Battleship North Carolina

13 Cape Fear Astro monthly meeting; 07:00 PM; via Zoom

14 New Moon; 04:18 PM UTC

18 Club Observing at Starfields; Shiloh Road Ivanhoe NC; 05:30 PM

19 Club Observing at Starfields; Shiloh Road Ivanhoe NC; 05:30 PM

21 Jupiter- Saturn Conjunction, 07:00 PM UTC; Jupiter 0.10 deg. SE of Saturn

21 Winter Solstice; 10:00 AM UTC

21 First Quarter Moon; 11:41 PM UTC

22 Ursid Meteors; ZHR 15; peak Dec 22 3h; near First Quarter Moon

30 Full Moon; 03:29 AM UTC; Cold Moon

Astro phenomena from https://www.universalworkshop.com/astronomical-calendar-any-year/

December Elections and Zoom Meeting

Sunday **December 13** is a day to mark on your calendar!

FIRST and probably Most Important:

Elections are required by the Constitution to take place IN PERSON with a quorum present. Therefore, at

3 PM at the Battleship North Carolina

we will meet for an in-person election. Please wear a mask and maintain social distancing.

We need at least 10 members for a quorum. In all probability, this will not take long, so please be prompt.

THANK YOU SO VERY MUCH!!

Next, at 7 PM we will have our **December Monthly Meeting via Zoom**

Program: A look at 2020 and looking forward to 2021 – member participation requested. Did you see or image the comet, Mars or other astronomical objects? And next year? AND, don't forget the **Geminid Meteor Shower tonight**.

Annual Meeting

by Jon Stewart-Taylor

On the evening of December 13th, our general meeting program will be an Official Annual Meeting. At this meeting we will look back at the accomplishments of the past year, and forward to our goals and plans for the next year.

The clubs officers will be doing some of the presentation. We will also be asking for your input: what has gone well, and what you members want from the club over the next year.

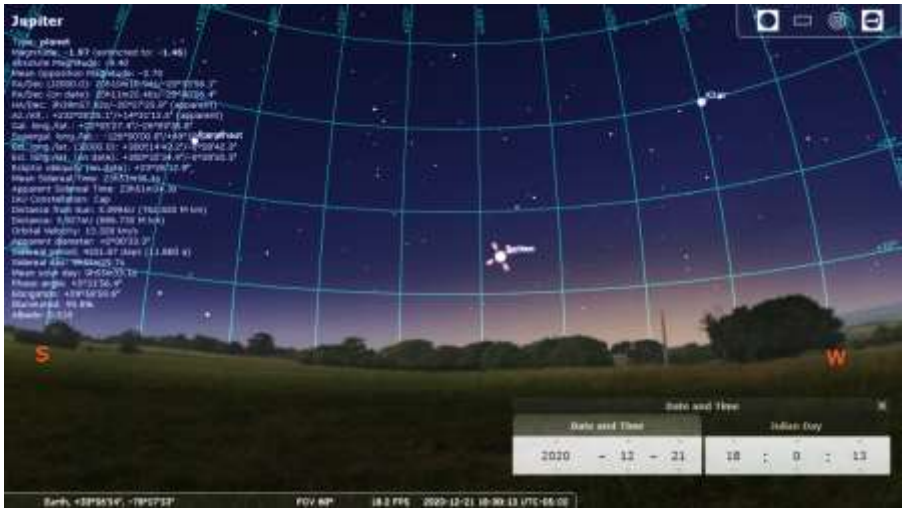
- ★ What has the club done over the past year which has met your needs and desires**?**
- ★ Has the club been giving you what you need**?**
- ★ Do you feel the club is meeting the standards required to achieve our educational and public requirements to be a 501(c)(3) corporation**?**
- ★ Perhaps even more importantly, where would you like the club to go in the next year**?**
- ★ Are there goals you would like the club to adopt**?**
- ★ Are there changes to the meeting format or content you'd like to see**?**
- ★ Are there activities you'd like the club to hold, sponsor, or participate in**?**

The second half of the annual meeting will be members chance to help set the goals, targets, and direction of the organization for the next year. We need your information and input to choose from available options. We can't do our best without you.

Saturn-Jupiter Conjunction

While December 21 is the date of this conjunction, it is interesting to watch the planets approach each other and the recede each clear night.

The top image at right is a Stellarium view on the 21st at about 6 PM EST. You should find a location with a good horizon to the South-West. You can probably spot Jupiter by 5:30 PM.



The second image shows the red frame of a DSLR with a “crop sensor”, an 8” f10 Schmidt-Cassegrain telescope and a 2X Barlow lens.

There is quite a bit of brightness differences between Saturn and its rings, Jupiter and the four Galilean Moons, so if you are imaging, take a number of images while varying the exposures.

At 7:00 PM, Jupiter will only be about 4° above the horizon, so you really only have about an hour of viewing; maybe quite a bit less if the horizon is inaccessible or cloudy.

My recommendation: like a total solar eclipse, whether you image, view telescopically or through binoculars or view naked eye, ***enjoy the experience!***

Next Saturn-Jupiter Conjunction: March 15, 2080.

Astronomical League Update

by Hank Lyon
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www.astroleague.org

With the holidays upon us, I wanted to make sure everyone was aware of gift possibilities from the AL. At the AL store link below, you’ll find a variety of purchase opportunities which include but are not limited to: AL logo items; books and calendars; charts and observing aids; observing manuals; mugs; shirts and T-shirts; hoodies; and appropriately introduced as of last month, AL logo winter knit beanie hats. https://store.astroleague.org

$13

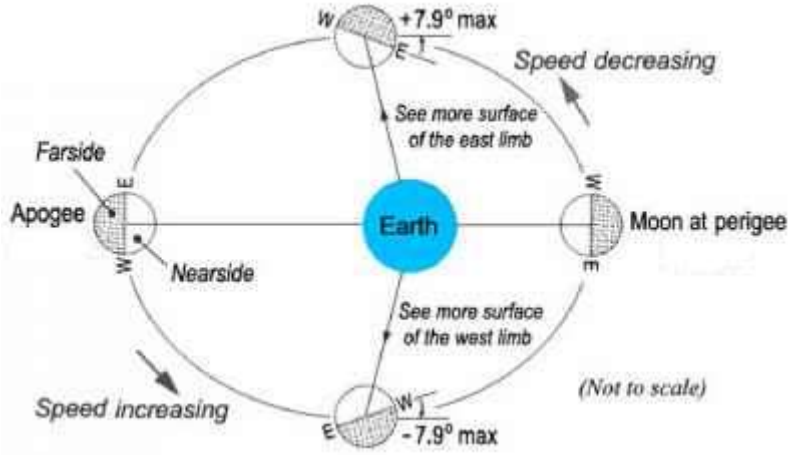
In addition, the AL is also aligned with several vendors who participate in the *Celestial Savings Program*. Under this program, participating vendors offer discounts on equipment ranging from 2.5% to 15%. Some of the more widely known participating vendors include Astronomics, Seymour Solar, Spectrum Telescope, Thousand Oaks Optical and Vixen Optics. Details on how you can take advantage of this program can be obtained via an information request at celestialsavings@astroleague.org.

What I Learned Coaching the Science Olympiad Participants
Lunar Libration
by Karl Adlon

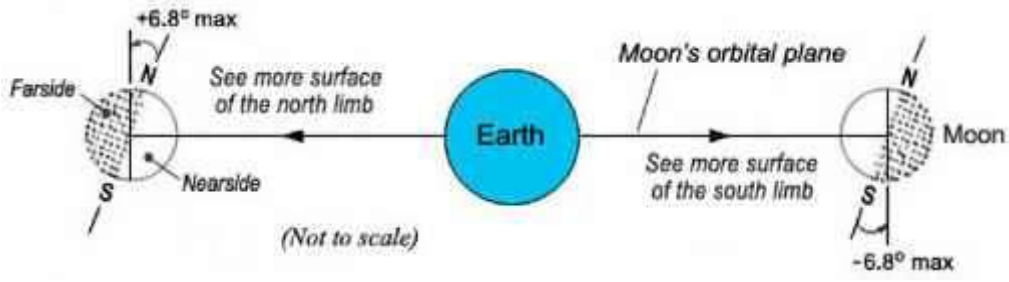
I knew that we could see more than 50% of the Moon's surface, that it nodding was the reason and it was called Libration. Up until 2 years ago, that was good enough for me. But then I volunteered to coach the Astronomy portion of the Science Olympiad and a knowledge of Lunar Libration was required.

I found the subject interesting and I learned that there are 3 effects than cause the libration.

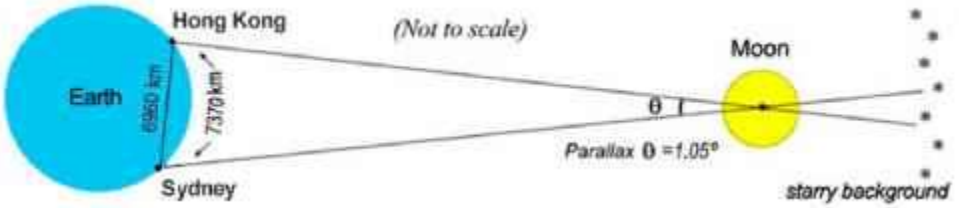
1. **Libration In Longitude** is due to the fact that the Moon moves faster when it is near perigee and slower when near apogee, but its rotation remains constant. This means that the Moon's rotation is not yet in perfect synchronization with its orbital motion. As a result, the Moon appears to wobble back and forth around its rotation axis. The additional longitudinal surface that can be seen with this libration is ±7.90.



2. **Libration In Latitude** is due to the tilt angle of the Moon's equator (or rotation axis) from its orbital plane. As a result, the Moon appears to nod its polar regions towards and away from the Earth as it goes around its orbit. The additional latitudinal surface that can be seen with this libration is ± 6.80.



3. **Diurnal Libration** gives an extra 1.05 degrees of visible surface round the east or west limb of the Moon, because the Earth's rotation brings a terrestrial observer at slightly different view angles between moonrise and moonset. Simultaneous observations of the Moon disc from two cities on Earth also produces a parallax, such as shown below.



Libration in longitude and libration in latitude occur concurrently and repeat every 27 ~ 28 days (approximately one sidereal month).

If you do an internet search of lunar libration, you can findexamples that show an object near the limb at different librations; one time it will be near the moon's edge and hard to see and aonther it will be away from the edge and easier to see. Check it out!

Geminid Meteor Shower

Sky & Telescope magazine calls the Geminids "the brightest, most reliable, and prolific annual meteor shower". This year's shower peak is the night of December 13/14.

Here are some tips to observe the Geminids:

- ★ Have a location in mind that is dark or with as little lighting visible.
- ★ Get some afternoon sleep. You can even sleep into the evening since best chance of seeing some is from about 11 PM to about 4 AM.
- ★ An outdoor recliner make observing more comfortable. Or lay down on a sturdy picnic table or bench.
- ★ Dress warmer than you think you need to be. Don't forget feet, hands and head.
- ★ Tuck yourself in a sleeping bag or wrap yourself in blankets.
- ★ A warm during or a snack during the night might help stave off sleepiness.
- ★ Consider taking notes about what you see – and sending them to the Editor for publication. I know members would like to hear of others' experiences.

Caltech Level 5

Is "A Knowledgebase for Extragalactic Astronomy and Cosmology". https://ned.ipac.caltech.edu/level5/

Look for "Text Search Engine", click on it and type in your search. I have found the 2nd set of results to give access to the papers and documents. Hal Arp's book on Peculiar Galaxies is there. I also found interesting papers on the history of dark matter research and discoveries.

New Year's Eve Recommendation: A bonfire of 2020 calendars!

Editor's Note: Used in this Newsletter, "Cape Fear Astronomical Society" may be abbreviated "CFAS" or "CFAstro".

CFAS Correspondence:
Please contact the society at: CFAS, P.O. Box 7685, Wilmington, NC 28406
Members are welcome and encouraged to submit articles or other input for *"CAPE FEAR SKIES"*. Submit any and all interesting items for publication to Karl Adlon, Editor (email kmja79@yahoo.com).

Cape Fear Astronomical Society is a tax-exempt organization under Section 501(c)(3) of the Internal Revenue Code.

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