

Vice President's Report

by Jon Stewart-Taylor

The last public event of 2019 is the Cape Fear Fair. Cape Fear Astro has been given access to a new kind of booth: A Free Community Booth

We will be staffing the booth on three days: Friday (opening night), Saturday six to midnight, and Sunday Noon till midnight. This will be Cape Fear Astro's biggest public event by attendance all year.

A team of Cape Fear Astro members are assembling to cover the event, but more members in the booth would be good. We intend to fly the club banner, distribute club business cards and possibly a trifold, and maybe bring a scope or two to give the public some idea of what's available.

Any planning for the fair this year has been short and frequently interrupted, since we did not know we were actually on for the fair until three weeks before the event.

Next year we hope to take a longer run at it now that we have more idea of what to expect.

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Also, we need a new vice president this year since I will be moving to the president position. Anyone who would like to coordinate public events and answer public inquiries would be a good candidate. If this might be you please don't hesitate to let us know at the November meeting.

From the Editor
 November 22 & 23 are Observing nights at Starfields. Daylight Savings Time is over and it's a good time to get out and observe. No telescope? Too much effort to transport your telescope? Come anyway; we will share; and let us enjoy each other's company!

Next CFAS Monthly Meeting

Sun, November 10, **7:00pm** – 9:30pm
 212 DeLoach Hall, UNCW Campus

Presentation: The Learning Center at PARI

GAStronomy Meeting

Sun, November 10, **5:00pm** – 6:45pm
 (Dinner, prior to the Monthly Meeting)

Crave Hot Dogs and Barbecue, 1407 Barclay Pointe Blvd
 Unit 401, Wilmington

Next Events - Public Star Parties

November 1 – 3 – Booth and Display at the Cape Fear Fair

Cape Fear Astro Calendar for November 2019

Events marked with ★ are Cape Fear Astro events.

★ **01 Cape Fear Fair booth and display (6-11)**

★ **02 Cape Fear Fair booth and display (6-11)**

★ **03 Cape Fear Fair booth and display (1-11)**

04 First Quarter Moon

05, 06 Taurids Meteor Shower

★ **10 Cape Fear Astro Monthly Meeting**

11 Veterans Day

11 Transit of Mercury Across the Sun

13 Full Moon

17, 18 Leonids Meteor Shower

19 Last Quarter Moon

★ **22 Observing at Starfields**

★ **23 Observing at Starfields**

24 Conjunction of Venus and Jupiter

26 New Moon

28 Thanksgiving Day

28 Mercury at Greatest Western Elongation

30 Moon, Saturn, Pluto w/in 3 1/2 deg.

Tourist Traps #4: Farewell Summer

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This is the last installment of Tourist Traps for the summer objects. In this you'll find 3 double stars, 2 planetary nebulae, and an asterism. All of these objects meet the criteria for a Tourist Trap, with all but M27 being very easy to find, and all of them are visually interesting in their own right, as well as being good representations of their class of object.

Albireo: Beta CYG; Double Star. One of the most beautiful doubles in the northern sky, as well as very bright (3rd magnitude) and easy to find. The 'eye' of the swan, Albireo is suitable for any size 'scope, or even binoculars, and never fails to impress people. It's best known for its beautiful color contrast. Most people see some variant of yellow and blue, though exactly which shades are highly dependent on the characteristics of your individual eye. Albireo is about 400 light years away. The primary is about 750 times more luminous than our sun, while the secondary is "only" about 100 times more luminous. Albireo was believed to be a true double, but their separation is so large (about 55 times the diameter of our solar system) and since there's been no change in their position since they were first observed in the 1830s, currently they're believed to just be line-of-sight aligned.

Epsilon Lyra: the double-double. On most nights, this is just a widely spaced double: two white stars a little brighter than 5th magnitude, and splittable even in binoculars. On nights with excellent seeing when you can crank up the magnification, each component comes apart into two. These are "real" doubles: each component in the close pairs orbit around the other, while the pairs themselves orbit around their common center of mass. The entire system is about 200 light years away. The northern pair are about 150 AU apart, and orbit every 1000 years. The southern pair are about the same distance apart, but take "only" 600 years to complete an orbit, because the stars are more massive.

M57: PN; the Ring Nebula in Lyra. The Ring is one of the classical examples of a planetary nebula, and was formed when its parent star shed its outer layers as it collapsed inwards, probably to become a white dwarf. It's clearly visible in just about any telescope giving over 30x as a ghostly donut, and larger scopes may show a yellowish color. M57 is one of the easiest planetaries to find, since it's about 1/2 way between beta and gamma LYR at the bottom of the Lyra "parallelogram". Based on the measured rate of expansion, the nebula is probably less than 20,000 years old. It's difficult to measure the distance, but current best estimates are in the neighborhood of 1300 light years, which leads to a diameter of about 1/2 light year.

The Coathanger: Collinder 399 (Brocchi's Cluster): Asterism in Vulpecula. Visually this is large, about 2 degrees across, so it may be best in binoculars or a finder. As the name implies, it really does look like an old-fashioned wooden coathanger, with 6 stars in an almost straight line and 4 others making a hook at the center of the line. This asterism is frequently "discovered" independently while sweeping through the area with binoculars. The status of this group as a cluster or asterism was under debate for years. It was generally thought that 6 of the stars shared a proper motion, and so should be members of a (very small) cluster. New data from the Hiparchos satellite have clarified that no more than 3 of the stars are in a "cluster", and the Coathanger has been officially demoted to an asterism. The brightest stars are about 420 light years away.

M27: The Dumbbell Nebula in Vulpecula. This one suffers quite a bit at light-polluted locations. On very transparent nights it's probably worth going after, but with limiting magnitude under 5 or if there's any haze in the air, you should probably go after M57 instead. When conditions are right, this is very good object. Medium magnification may increase the contrast and make it easier for visitors to see. As with M57, the nebula is the outer layers of a star, shed as the star evolved into a white dwarf. It's about 1000 light years away, and about 2 light years in diameter.

Gamma Delphini: Double star. This is the dolphins "nose". The brightness of the two stars differs by about a magnitude (4.5 and 5.5), with a very subtle color contrast. While not the spectacular object Albireo is, it's still a very nice view, and unlike Albireo, this is a true double with a very long orbital period. If you have an unusually wide field medium power eyepiece, you may be able to fit another double star (Struve 2725) into the same field of view. Struve 2725 is much fainter (magnitudes 7.3 and 8.2). Both Gamma and Struve 2725 about 100 light years away, so Gamma really is brighter.

The next article will address some fall objects: M15, M2, and M31/32/110.

Fleet-Footed Messenger

by Brad Johnson

On November 11th, all eyes will be on the solar system's innermost planet. A rare planetary transit will bring Mercury directly in front of the sun on Veterans Day. For our location, it begins at 7:36 am. It will last 5 hours, 28 minutes, ending at 1:04 pm. Crossing east to west, the tiny black disc will appear just 10 arc seconds across. The next transit of the planet Mercury will be November 13, 2032, but will not be visible in North America. The next opportunity for us to view a transit will not occur until 2049!

Mercury zips around the sun in just 88 Earth days, traveling at nearly 112,000 mph (29 miles per second) in a highly elliptical orbit. This path takes the planet as close (perihelion) as 29 million miles and as far (aphelion) as 43 million miles from the sun. This close proximity to the sun results in a surface temperature that exceeds 800 degrees Fahrenheit on the sunlit side, and a temperature of minus 279 degrees Fahrenheit on the night side of the slowly rotating planet. Mercury is tidally locked with the sun in a 3:2 spin-orbit resonance. It's tiny axial tilt is the smallest in the solar system.

The position of Mercury's perihelion processes around the sun at a very slow rate, Very small differences between observed and predicted values using Newtonian mechanics could not be explained by 19th century astronomers. This discrepancy was believed to be due to the presence of another planet closer to the sun than Mercury (Planet Vulcan). Of course no such planet was ever found. Einstein's General Theory of Relativity provided the answer.

Mercury is the smallest of the planets and is only slightly larger than our moon. It has an unusually massive solid inner iron core for such a small planet and has the second highest density in our Solar System, only slightly less than Earth's density. It consists of approximately 70% metallic and 30% silicate material. The surface looks similar to that of our moon and appears heavily pockmarked with craters. The Solar System has not been kind to this small world. Early in it's history, it was struck by a large asteroid which created an impact crater 960 miles wide (Caloris Basin).

Two spacecraft missions have been sent to Mercury. Mariner 10 flew by the planet in 1974 and 1975. It was launched by NASA on November 3, 1973 to explore both Venus and Mercury. Only 45% of the surface was mapped during these flybys. The planet is too close to the sun to be safely imaged by the Hubble Space Telescope. The Mariner mission discovered that Mercury has a very tenuous exosphere as well as a weak magnetic field.

NASA's MESSENGER mission was launched on August 3, 2004. The spacecraft finally entered orbit on March 18, 2011 (getting to Mercury is not easy!), The mission was very successful, performing amazing science and obtaining incredible images of this elusive world. One of the most surprising discoveries was the presence of water ice in the permanently shaded craters around its North Pole. Sadly the mission ended on April 30, 2015, when the spacecraft, which had run out of fuel, crashed onto the planet's surface. The BepiColombo spacecraft was launched on October 20, 2018. It is a joint mission of ESA and JAXA and should arrive in December 2025 to continue the exploration of this "Fleet-Footed Messenger.

October Events

Thanks to Tom Jacobs

Who says you can't be in two different places at the same time? CFAS can!

Well, we *could* have if clouds didn't cause Carolina Beach State Park to cancel their public star party.

The Cape Fear Museum (CFM) "International Observe the Moon Night" event happened. But it was not an observing event. At about 1730 or so the folks at the CFM decided to forgo all the outside activities. So Karl set up his 8 inch SCT as a static display near the old sloth. He did remove the dust covers and inserted an eyepiece. He was focused on a street light across the street, so terrestrial observing did happen. We also had Kat's binoculars out. A pair of 10x50 if I remember correctly. People were using the binoculars to look at things inside the museum.

We even showed people views of the moon from inside the CFM. Karl had an image of the moon on his phone that he had taken "A focus". I had a copy of Saturday's APOD on my phone. (You do what you gotta do.)

CFAS members present included Karl, Kat and friend Andrea, Ben, and TDJ.

We pass out all the CFAS Business cards, that we had with us, to people who express and interest in the Society. I think that several of the CFAS attendees will need to replenish.

Given the weather conditions, this was a successful public session. I can say that the Museum people were very happy with the public turnout. According to one of the museum volunteers, the most popular attraction was the "Moon globe" upstairs. As it was explained to me the moon globe was a "selfie magnet".

CFM reports that they had 130 visitors that night – even with the clouds!

Good night. Oh for ...

Clear skies and gentle breezes,
tdj

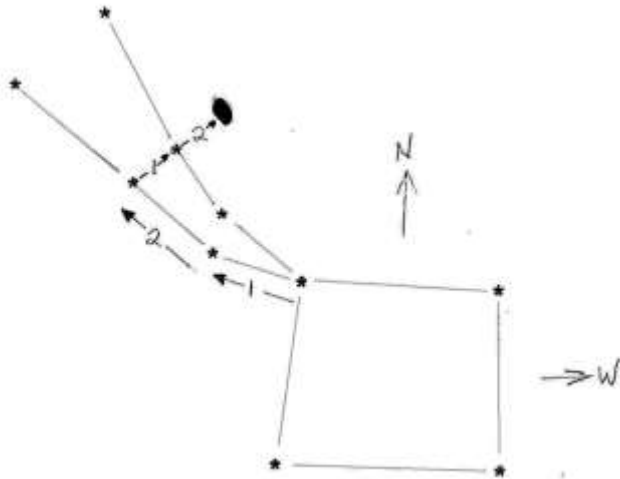
Overhead -by Karl Adlon

Overhead is the best direction to look when the skies are not clear because you look through the least amount of light polluted air. However, you may find the eyepiece in an uncomfortably low position, depending on your telescope and mount design.

With a refractor, I've used a step stool as a low seat but getting up from it can be a problem for some.

Dobsonians put the eyepiece in a good location but directly overhead can cause it to be difficult to track objects.

About 9 PM the Great Square of Pegasus is overhead and the Summer Triangle has moved to the west. You'll notice that the sides of the square closely face the cardinal directions.



While it's called the Great Square of Pegasus, only 3 of the corner stars are in Pegasus with the 4th being in Andromeda. The 4 corner stars, clockwise from the NW star, are:

NW: β PEG
SW: α PEG
SE: γ PEG
NE: α AND

From the Northeast star, α AND, you should be able to see, if the skies are good or better, two strings of stars as shown in the above sketch, heading northeast and north-northeast. From α AND, count 1, 2 stars along the Northeast (southern) string. Then see the star about the same distance from α AND on the other string and look about the same distance in the same direction. If skies are good, you can probably see the glow that is M31, The Andromeda Galaxy. Aim your binoculars or low power scope in this direction and you should easily see the galaxy, even though it is 2.5 million light-years away. I remember one open house / public star party at St. Ambrose University's observatory. A high school teacher was in attendance. He asked if I could show the Andromeda Galaxy and I aimed my 10" Dobsonian at it. He looked a long time and I appreciated that. Then he asked how he could find it in the sky and I gave him these directions which he used to find it in his binoculars. He did this a couple times so he'd remember it. I think he wanted, some time in the future, for his students to see it.

Below is one of the first decent astrophotos I took.

This nearest galaxy to us Northern Hemisphere observers spans about 3 degrees of the sky, or about 6 moon-widths. In a telescope with 2000 mm focal length, even with your lowest power eyepiece you may only see 1 degree of sky, or 1/3 of the galaxy's span. In a good sized scope under favorable conditions the inner dust ring, which lies between the spiral arms, is an obvious aspect of the view.

There are 2 companion galaxies that are visible in most scopes as well as the image above. M32 is to the left of the core of the image above. M110 is below and to the right of the core.

Cecil once brought his 30" Dobsonian to the Eastern Iowa Star Party. He aimed the scope toward M31 and while I was having a look he said what I was thinking: that it didn't look like he (I) remembered. I moved the scope around a little and came on M31. He had it on M110, which actually looks decent in a 30" telescope!

And M31 was huge and quite detailed!



Daytime Observing Reports

Here's a pic (below) of the sundogs I saw at Ft. Fisher on 10/21/17. – Terry Herrin



There was a glorious sundog visible yesterday afternoon from about 5:15 to 6:00 PM. Had a deep gold fringe on the right edge. Was in the car and couldn't get a pic. Was about 15 to 20 deg. left of the sun and 25 elevation. There really are things to see in daylight, . . . though not often.

– Skip Hager, Oct. 24, 2019

I guess this one also counts as a daytime observing event since we were observing and it was daylight early in the evening.

This photo was provided by Cape Fear Museum.

Left of center, seated, is Ben and right of center, standing, is Kat. A youngster is looking through my finder scope while his Mom talks with Ben. Can you find my forehead and blue shirt behind the group?

Later, it became too dark to see anything outside – until the streetlights came on. Then I moved the scope slightly and aimed at it out that right window. The streetlight had a rippled glass cover and when asked what they were seeing at 150X, most did not know until I pointed it out. I think they were impressed. I wish I could have shown them the Moon! –Karl Adlon



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

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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).

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