



"CAPE FEAR SKIES"

Cape Fear Astronomical Society Newsletter

Wilmington, NC and Surrounding Areas

August 2019



Vice President's Report

by Jon Stewart-Taylor

July has been a good month for Cape Fear Astro public outreach. Our monthly Carolina Beach State Park observing session, was popular despite the skies being completely overcast. In his report to the e-mailing list, Skip said:

Probably one of the largest attendances that I have seen other than for the state star party. So a tailgate lecture/discussion on the moon, Jupiter and moons, beginners scopes, etc. All in all a very good night but a big disappointment as far as viewing.

The same night, since Skip was covering CBSP, Kathleen and I were able to do an invitation-only event for the Sneads Ferry Quality Child Care Center (SFQCC). We'd planned stories, moon phases, model solar system, and moon/Jupiter observing.

Conditions were slightly better than at CBSP, but still not great. The wind was doing about 10-15 from the south, The moon and Jupiter were playing peekaboo with the clouds And, the crowd skewed very young, with maybe 75% being under the age of 3, or the parent thereof.

The stories were popular; we omitted the moon phases, and only went to Jupiter on the solar system.

The moon was very popular even with quite young ones, but they went home to bed after one look. By the time we switched to Jupiter, it was just the older children. Jupiter was very shaky, but the adults and most kids got to see three moons.

SFQCC sent an e-mail the next day:

Thank you so much for coming and providing such an enriching event for our families. We wish the turn out would have been greater, but everyone who went had fun!. Thank you again. We greatly appreciated your lessons and your wife's storytelling!

One last event in July: on the 31st, Jon will do the 1000 Yard Solar System (though again, probably only as far as Jupiter) at the Hampstead branch of the Pender County Public Library.

For August, so far we have only two events:

- ★ August 3rd at CBSP, featuring Jupiter, Saturn, the moon, and all those summer Milky Way clusters.
- ★ August 9th at the Duplin County Public Library in Kenansville.

Further away, the Pender County Public Library will be receiving a loaner StarLab transportable planetarium in September/October. Allan Hillburn will be coordinating our presence at the Cape Fear Fair the first week of November. Due to the park's early closing during winter, the last scheduled CBSP public session is in October.

Next CFAS Monthly Meeting

Sun, August 11, **7:00pm** – 9:30pm
212 DeLoach Hall, UNCW Campus

Presentation: **Bring an item and tell us about it!**

GAstronomy Meeting

Sun, August 11, **5:00pm** – 6:45pm
(Dinner, prior to the Monthly Meeting)

Big Thai 2, Shopping Center, 1319 Military Cutoff Rd

Next Event - August Public Star Party

August 3, **7:00pm** – 9:45pm
Carolina Beach State Park

Cape Fear Astro Calendar for August 2019

Jon Stewart-Taylor

Notable events for August. Most events taken from Guy Ottewell's [Astronomical Calendar 2019](#). I've taken the liberty of adding observing sessions at Starfields to the list, subject to weather. Cape Fear Astro events are preceded with a star (★).

- 1 New Moon
- ★ 2 Observing at Starfields
- ★ 3 Public Observing at CBSP
- 7 First Quarter Moon
- 9 Mercury at greatest western elongation, morning
- 10 Moon 2.5 deg from Jupiter
- ★ 11 CFAS Meeting
- 12 Moon 1/4 deg from Saturn
- 12/13 Perseid meteor shower (morning, Waxing Gibbous Moon)
- 15 Full Moon
- 15 Venus brightest, ~ mag. -4
- 23 Last Quarter Moon
- ★ 23/24 Observing at Starfields
- 30 New Moon
- ★ 30/31 Observing at Starfields

Tourist Traps: Presenting Deep-Sky Objects During Public Observing

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Introduction

If you've provided optics at a public observing session you've probably faced the problem of what to show people. The moon is usually available during these sessions, and if there are any planets up, they're usually crowd pleasers (except Mars, unless it's during a close approach). But, unless you're the only one with a scope, or your scope is fairly specialized for planets, at some point you'll turn to deep-sky objects.

There are a few deep-sky objects which really are spectacular through even small scopes. But, let's face it, most deep-sky objects are small, grey, fuzzy and look like eraser smudges. To make matters worse, most public sessions are in locations some light pollution, and usually with at least some moonlight.

So, the deep-sky objects which make good public session targets and therefore get visited over and over ("tourist traps") generally have most if not all of the following characteristics:

- ★ Easy to find, even in light-polluted conditions.
- ★ Able to stand up to a bright background sky.
- ★ Representative of a class of objects.
- ★ Unusual or distinctive trait or appearance.

Whether a particular object meets these standards may depend on how big your scope is. Under most conditions, a bigger scope will show more than a smaller one.

Some objects really are spectacular, and can stand on their own. For most of the rest, when you show people a small grey fuzzy, they'll usually get more out of what they're seeing if you can tell them why you're choosing this object and give information on it: How big is it? How far away is it? How many stars does it contain?

In this series of articles for Cape Fear Skies I'll present my suggestions for Tourist Traps. I'll discuss why I've chosen them, and include at least some of the "how far", "how many", and "how big" information. My ultimate goal is to make a 12 month guide to deep-sky objects for public sessions. Each month's section can be used as an observing plan, and can be printed and handed out at observing sessions.

This first installment is mostly Summer Tourist Traps:

Graffias (Beta Scorpius); Double star.
M13, Globular cluster: the Great Hercules cluster.
M92, Globular cluster in Hercules
Ras Algethi (Alpha Hercules): Double star.
M4, Globular cluster in Scorpius.
M6 and M7: open clusters in Scorpius.
M8: The Lagoon Nebula -and open cluster in Sagittarius
M20: The Trifid nebula, in Sagittarius.
M22: globular cluster in Sagittarius.
Epsilon Lyra: the double-double.
M57: The Ring Nebula; Planetary nebula in Lyra.
Albireo (Beta Cygnus): Double star.
M17: the Swan nebula in Sagittarius.
M11: The Wild Duck Cluster: open cluster in Scutum.
The Coathanger: Asterism in Vulpecula.
M27: The Dumbbell Nebula in Vulpecula.
Gamma Delphini: Double star.

Here's some info on three of these objects in **Hercules**. They'll be visible pretty much all summer during the observing hours most public sessions keep.

M13, Globular cluster. Probably the most observed globular cluster in the northern hemisphere, and for good reason. It's a spectacularly beautiful cluster in almost any scope at pretty much any power. It is bright enough to stand up to considerable magnification, and more power brings out additional detail. The cluster's outer regions resolve into chains of stars.

M13 is about 22,000 light years away, and about 145 light years across. Estimates on the number of stars it contains vary from several hundred thousand up to nearly a million. The age of the cluster is estimated at about 15 billion years. Compare to the age of the earth at 3.5 billion years.

M92, Globular cluster, is usually overshadowed by its more famous neighbor, but it's a very nice object in its own right. It's at nearly the same distance (about 26,000 light years away), but only about 2/3rds as large: around 109 light years across. It's also a little younger at around 14 billion years. M92 is much more compact than M13, and doesn't have the chains of stars.

Ras Algethi (Alpha Hercules): Variable and double star. Ras Algethi is the head of Hercules (usually portrayed as kneeling with his feet towards the North Pole) and is located near the brighter Ras Alhaugue, the head of Ophiuchus (the Physician). It is a binary star with a very nice color contrast. Most observers see some variant of orange for the 3rd magnitude primary and many see green for the 5th magnitude secondary.

The two stars are a true binary, with an orbital period on the order of 4000 years. The primary is a red giant, one of the largest stars known: about 300 times the size of our sun at 350 million miles, but only about 4 times the sun's mass. The earth's orbit would be inside Ras Algethi. Like most red giants it is variable, changing almost a full magnitude over a period of about 90 days. Ras Algethi is about 400 light years away.

I'll go into more detail about the Summer objects in the next few newsletters, and hopefully finish in time for a new list for fall.



This article is distributed by NASA Night Sky Network

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Chill Out: Spot an Ice Giant in August
By David Prosper

Is the summer heat getting to you? Cool off overnight while spotting one of the solar system’s ice giants: Neptune! It’s the perfect way to commemorate the 30th anniversary of Voyager 2’s flyby.

Neptune is too dim to see with your unaided eye so you’ll need a telescope to find it. Neptune is at opposition in September, but its brightness and apparent size won’t change dramatically as it’s so distant; the planet is usually just under 8th magnitude and 4.5 billion kilometers away. You can see Neptune with binoculars but a telescope is recommended if you want to discern its disc; the distant world reveals a very small but discernible disc at high magnification. Neptune currently appears in Aquarius, a constellation lacking in bright stars, which adds difficulty to pinpointing its exact location. Fortunately, the Moon travels past Neptune the night of August 16th, passing less than six degrees apart (or about 12 Moon widths) at their closest. If the Moon’s glare overwhelms Neptune’s dim light, you can still use the its location that evening to mark the general area to search on a darker night. Another Neptune-spotting tip: Draw an imaginary line from bright southern star Fomalhaut up to the Great Square of Pegasus, then mark a point roughly in the middle and search there, in the eastern edge of Aquarius. If you spot a blue-ish star, swap your telescope’s eyepiece to zoom in as much as possible. Is the suspect blue “star” now a tiny disc, while the surrounding stars remain points of white light? You’ve found Neptune!

Neptune and Uranus are ice giant planets. These worlds are larger than terrestrial worlds like Earth but smaller than gas giants like Jupiter. Neptune’s atmosphere contains hydrogen and helium like a gas giant, but also methane, which gives it a striking blue color. The “ice” in “ice giant” refers to the mix of ammonia, methane, and water that makes up most of Neptune’s mass, located in the planet’s large, dense, hot mantle. This mantle surrounds an Earth-size rocky core. Neptune possesses a faint ring system and 13 confirmed moons. NASA’s Voyager 2 mission made a very close flyby on August 25, 1989. It revealed a dynamic, stormy world streaked by the fastest winds in the solar system, their ferocity fueled by the planet’s surprisingly strong internal heating. Triton, Neptune’s largest moon, was discovered to be geologically active, with cryovolcanoes erupting nitrogen gas and dust dotting its surface, and a mottled “cantaloupe” terrain made up of hard water ice. Triton is similar to Pluto in size and composition, and orbits Neptune in the opposite direction of the planet’s rotation, unlike every other large moon in the solar system. These clues lead scientists to conclude that this unusual moon is likely a captured Kuiper Belt object.

Discover more about Voyager 2, along with all of NASA’s past, present, and future missions, at nasa.gov

Credit Jon for suggesting this article.

Neptune is about 23 degrees above the horizon at Midnight on August 1, so my suggestion is wait a month or two for it to be higher at an earlier hour. -Karl



Clockwise from top left: Neptune and the Great Dark Spot traced by white clouds; Neptune’s rings; Triton and its famed icy cantaloupe surface; close of up Triton’s surface, with dark streaks indicating possible cyrovolcano activity. Find more images and science from Voyager 2’s flyby at bit.ly/NeptuneVoyager2 Image Credit: NASA/JPL

Picture Page



Story telling at Sneads Ferry. I see some very young future amateur astronomers here.



Grissom's Liberty Bell 7 now resides at the Kansas Cosmosphere in Hutchinson, KS after being retrieved from the floor of the Atlantic Ocean. You can't see it in this picture, but the hatch frame is bent. Some believe the capsule splashed down on the hatch, bending the frame and causing the hatch bolts to later fail.

Below: To go with Jon's article on Page 2, here are images I took of M13 and M92 in 2017. -Karl



Out of Curiosity

This is taken from an article I wrote 7 years ago. Better cameras are available, but I still find the basic pretense of the article interesting. Hopefully, you do too.

At that time, I got a ZWO ASI120MC. It was a \$300 camera that replaces the eyepiece in a telescope and that is connected to the USB port of a computer. Aim the scope at a planet or the Moon and you can record a video. During the video there will be instances where the image is sharp while most of the time it is shaky due to turbulence in Earth's atmosphere. You can then run a program that reviews the video frames, picks out the sharpest and stacks them for a clear image. Here is an image of Jupiter that I produced using this approach.



I was looking at ZWO's website and saw that people were trying the camera on faint objects. Instead of operating at 25, 50 or higher frames per second, they operate at 1 frame in 20 seconds or even more.

I had become interested in imaging details in planetary nebula (PN). PN are the remains of stars that have evolved off the main sequence (which the Sun is currently on) to become first red giants and then white dwarfs. In the process the outer gasses of the star are lost to space and the white dwarf, which is small and energetic, supplies energy in the ultraviolet range to cause the lost gasses to shine in visible light.

I decided to try the camera on the Dumbbell Nebula and recorded 35 frames, varying the gain and exposure times as the video was being recorded. The video is interesting to watch, but the nebula is rather faint.

The program that came with the camera is for bright planets, so it turned out to not work. I tried a different program, one that is less specific but doesn't give quite as good results for planets. Registax 6.

The first result showed lots of camera noise – as expected.

Several days later I recorded a dark frame video. To get a dark frame I used QuickTime, stopped the video, made the program full screen and copied the frame. I then pasted it into Paint and saved it as a bmp file. I then used that as the dark frame in Registax 6, otherwise running it as normal.

(I tried saving the dark frame in different formats, BUT I found that only bmp and jpg actually deleted the hot pixels. And no, I don't know why.)



Using only the best 12 of the 35 frames (that's only about 6 minutes total exposure) the image shows some pretty good detail in the nebula.

The sensor is only 1/3" square, so tracking needs to be very good to not smear the image over the 30 second exposure. -Karl

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