THE FLINT RIVER OBSERVER

NEWSLETTER OF THE FLINT RIVER ASTRONOMY CLUB

An Affiliate of the Astronomical League

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Officers: President, **Dwight Harness** (1770 Hollonville Rd., Brooks, Ga. 30205, 770-227-9321, rdharness@yahoo.com); Vice President, **Bill Warren (**1212 Everee Inn Rd., Griffin, Ga. 30224, warren7804@bellsouth.net); Secretary, **Carlos Flores**; Treasurer, **Jeremy Milligan**.

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Club mailing address: 1212 Everee Inn Rd., Griffin, GA 30224. FRAC web site: www.flintriverastronomy.org.

Please notify **Bill Warren** promptly if you have a change of home address, telephone no. or e-mail address, or if you fail to receive your monthly *Observer* or quarterly *Reflector* from the A. L.

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Club Calendar. Thurs., June 14: FRAC meeting (7:30 p.m., The Garden in Griffin); **Fri.-Sat., June 15-16:** JKWMA observings (at dark); **Fri., June 22:** Fayette Co. Recreation Dept. public observing (Lake Horton, 8:30 p.m.); **Sat., June 23:** FCRD rainout date (same time, same place).

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President's Message. My, how time flies! It seems like only yesterday that the Harnesses were at the beach, with little **Laura** dumping a double handful of sand onto her sister **Elizabeth's** head just as a photo was being taken.

Laura was married on May 19th. I haven't had time to prepare a President's Message, so I'll just say that I hope you are doing well and enjoying your membership in FRAC. (Unless, that is, you'd like to hear about the time that Laura and I – you're gonna like this! – we were…)

-Dwight Harness

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Last Month's Meeting/Activities. "Our High Falls State Park public observing on April 28th went very well," reports **Sean Neckel**. "We had about 25 participants of all ages." FRAC members in attendance included **Alan Rutter; Elaine Stachowiak; Truman & Denise Boyle; Eva Schmidler; Sean & Giannal Neckel; Felix Luciano;** and **Steve Benton.**

We had 19 members – speaker **Carlos Flores; Dwight Harness; Eva Schmidler; Alfred McClure; Alan Pryor; Joseph Auriemma; Aaron Calhoun; Dawn Chappell; John Felbinger; Felix Luciano; Ken & Rose Olson; Cindy Barton; Wayne Gardner; Erik Erikson; Marla Smith; Tom Moore; Steve Hollander** and **yr. editor** – and visitors **Winston Yang** and **Willie & Sydney Bohles** – at our May meeting. Carlos's presentation**,** "Astronomy Under Clear Skies," was an overview of what astronomy and FRAC are all about. It is intended for use at indoor public presentations, and you can get a copy of it by contacting Carlos at cflores111@hotmail.com.

It's difficult to say which we enjoyed more, Carlos's talk or the homemade cookies brought by Ken & Rose. Both were excellent.

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This 'n That. On March 14, 2018 the world lost its most brilliant cosmologist and astrophysicist when **Stephen Hawking** died at his home in Cambridge, England at age 76.

As a young man starting out in astrophysics, Hawking was stricken with amylotropic lateral sclerosis (ALS, or Lou Gehrig's disease) that left him wheelchair bound throughout his adult life and increasingly dependent on computers to help him speak.

Although originally told that he was unlikely to live more than two years, Hawking nevertheless

survived for five decades. In the process he forged an unparalleled career that skyrocketed him to the top of the astronomy world. His 1988 book, *A Brief History of Time: From the Big Bang to Black Holes*, sold more than 10 million copies and made him the world's most famous astronomer. In 2014, the critically acclaimed movie "The Theory of Everything" depicted Hawking's personal life and career.

Hawking never lost his sense of humor. He said that his hero was Superman because "he's everything that I'm not." (We respectfully disagree: Stephen Hawking wasn't faster than a speeding bullet, nor could he leap tall buildings at a single bound – but considering the magnitude of his accomplishments under the worst imaginable circumstances, Hawking had it backward: He should have been Superman's hero.)

Referring to his situation, Hawking once said that "However difficult life may seem, there is always something you can do and succeed at…My advice to other disabled people would be to concentrate on things your disability doesn't prevent you from doing well, and don't regard the things it interferes with. Don't be disabled in spirit as well as physically."

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Upcoming Meetings/Activities. Our June club meeting will be at 7:30 p.m. on **Thurs., June 14th,** at The Garden in Griffin. Our program will be the **Alex Filippenko** dvd, "Our Sun: The Nearest Star."

Our JKWMA club observings will be on **Fri.-Sat., June 15th-16th.** The sky hasn't treated us kindly so far in 2018; maybe conditions will improve starting this month. Be sure to go to our website and read **Smitty's** article, "Attack of the Martian Mosquitos," to remind you how to prepare for comfortable warm weather observing.

On **Fri.**, **June 22nd**, we'll travel to Lake Horton in Fayette Co. to conduct a public observing for the Fayette Co. Recreation Dept. The event will begin at 8:30 p.m., and a huge crowd is expected. (The rainout date will be **Sat., June 23rd,** same time.)

Observing Chairman **Sean Neckel** put a lot of time and effort into scheduling this event, which will be the first of two Lake Horton observings. (The other one will be on **Fri., July 20th**.) These events likely will be our largest of the year, so please make every effort to participate.

To get to Lake Horton from, say, Griffin, go 10.6 mi. toward Fayetteville on Ga. 92 from the stoplight at U. S. 19/41 and turn left at Woolsey Rd. (It's just past a gas station on the right.) Go 0.7 mi., and turn left at the stop sign at Antioch Rd. Go 0.4 mi., and continue straight toward Lake Horton where the main road curves to the right.

The park entrance is 1.0 mi. ahead. After passing through the gates, turn right at the black asphalt road about 50-100 yds. beyond the entrance. That winding road through the woods leads to a large parking lot; that's where we'll meet. We'll set up our 'scopes on the grassy hill between the parking lot and the main road, then drive our cars back to the parking lot.

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The Sky in June. Mercury (mag. 0.3) and **Venus** (mag. -4.0) will be bright "evening stars" in the NW and W, respectively. **Jupiter** (mag. -2.4) will be up practically all night in the S. **Saturn** (mag. 0.0) will rise around 10 p.m., and **Mars** (mag. -1.2 and brightening steadily) will rise around midnight.

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Telescopes, Part 3

by Bill Warren

Portability

Let's start with the obvious: no matter what kind of telescope you select, the larger it is, the more room it will take up in your vehicle. Before buying a 'scope, you need to know whether it will fit in your vehicle.

With the exception of your eyes and binoculars, "grab-and-go" table 'scopes are the most easily portable observing instruments. They range in size from 3" to 6" apertures. Most of them don't have tripods, so you'll need a table, stool or tv tray to set them on. (Even then, though, you'll do a lot of stooping and bending over to see through the finderscope and eyepiece.)

Beyond that, best advice is to measure the available space in your vehicle before buying a 'scope. Dobsonian reflectors feature two parts, a base and the optical tube assembly (OTA). Newtonian reflectors, refractors and Cassegrains have three parts – tripod (or base), mount and OTA.

Being basically lazy, I disliked having to remove the OTA from my reflector's tripod and mount so I left them connected after observing, which took up more space in my car than if I had removed the tube.

Quality of Images

Refractors win this, hands down. Images – especially planetary – are crisp and sharply defined (but small) in refractors. But since the planets are extremely bright, they respond extremely well to high magnification, and you can use a Barlow lens to double or triple the magnification.

As for reflectors – well, image contrast is not as good as a refractor produces, but the difference is more than amply compensated for by the wealth of detail you'll see in distant galaxies, nebulae and star clusters.

Cassegrains rank somewhere between refractors and reflectors in image quality. The "sealed tube" design that protects the mirrors also tends to trap warm air inside the tube, which can lead to unsteady images on cold evenings. Still…The fact that Cassegrains are available in fairly large sizes makes them highly desirable for planetary and deep-sky observing and photography.

Light-Gathering Power

Dobsonian reflectors are the overwhelming favorite when it comes to gathering photons of light. The term *aperture fever* has been applied to astronomers who, having bought, say, an 8" Dob, immediately begin wondering what the universe looks like in a 10", 12", 14" or larger Dob. Hey, if you've got the money, honey, there's a Dob out there that is big enough to satisfy the most virulent case of aperture fever!

There is, however, a big trade-off to consider here. The bigger the 'scope, the more it will cost – but equally important, *the more it will weigh!* What happens if, after buying your dream monster Dob or a big Cassegrain, you hurt your back?

(And don't forget: If you purchase a really big Dob, you may need a larger vehicle, a ladder to reach the eyepiece, and you'll have to move the ladder whenever you move the OTA.)

One other consideration: If you're new to astronomy and observing, *don't* start off by purchasing a big telescope, no matter how infatuated you are with deep-sky objects. The size will literally magnify the problems you'll encounter in learning how to set it up, operate it and navigate the night sky. We've always recommended that a beginner's first telescope should be no larger than 6" (or possibly 8").

Simplicity of Use

Refractors. Smitty discussed the problems involved in learning how to operate a refractor's slow-motion tracking control knobs in the dark – but once you learn how to do that through practice, the rest is simplicity itself if you have an altazimuth mount. (Equatorial mounts are more difficult to handle because the tube moves differently and must be locked and unlocked in place whenever you move it.)

Refractors are already collimated, but you'll need to collimate your finderscope. (Hint: Do it during the daytime, using a distant treetop or something else as your target.)

Reflectors. All reflecting telescope primary mirrors require periodic cleaning because they are exposed to dust, etc., at the open end of the OTA. (Two hints: First, get someone in the club to show you how to do it the first time. And second, don't do it often. It takes a long time for enough dust particles to accumulate on the mirror to affect what you see in the eyepiece.)

Reflectors also must be collimated, since the primary mirror cell can be jarred out of alignment by driving over potholes, bumpy roads, etc. Any veteran FRAC member can show you how to collimate your reflector. (Or see my article, "Collimating Your Primary Mirror," in the Apr. '17 *Observer.* It's on our website.)

Fortunately, the diagonal secondary mirror normally doesn't need collimation. You'll know if it does if your eyepiece field of view (fov) resembles a Gibbous Moon rather than a Full Moon, or if the stars along the perimeter of your fov look like hyphens rather than points of light.

You also have to collimate the finderscope (in the daytime) or Telrad (at night).

Having said all that, setting up a Dobsonian 'scope for use is easy. Just find a level spot for the base, plop the tube down onto it in the circular groove, and presto!, you're ready to go!
(Note: That's not true if you're using a truss tube Dob, or a Dob with a motorized mount.)

Cassegrains. Generally speaking, the more complicated a 'scope is, the longer it will take to set it up for operation and master its use. Throw in preparing for astrophotography and/or polar- or star-aligning for motorized tracking, and you may be looking at half an hour or more of setup and takedown time. (I'm not suggesting that you shouldn't buy a Cassegrain telescope; you just need to know that, with the possible exception of their smaller versions, Cassegrains can be a handful for beginners.)

GoTo and PushTo. These aren't types of telescopes; they are computerized devices that are either built into telescopes (GoTo) or can be added to them (PushTo). In both cases, they are used to locate objects electronically. Both feature a hand-held controller pad in which you punch in the object's name (e.g., **Saturn** or **M31**). GoTo finds the object for you; PushTo tells you where to aim the OTA manually to find what you're looking for.

Both types are wonderful labor-saving devices when used by astronomers who are experienced enough to learn how to align them. For beginners who are not tech-oriented, though, it's not necessarily easy to learn. We've had a couple of members who never mastered the process.

That's not to say that you shouldn't buy a GoTo 'scope or a PushTo device. Just be aware that, as with everything else in astronomy, there's a learning process involved. (The manufacturers don't tell you that. They're too busy telling you what all you can see without doing any work.)

Cost

Cost is the most important feature involved in buying a telescope. I've placed it last because there are other things you need to consider before you decide what kind of telescope you need. For example:

*If you want to observe the **Moon**, comets and planets, a little refractor will do nicely. You can buy a 3-1/2" equatorial refractor for about $325. With minimal care, it will last forever.

*If your primary interest is deep-sky observing, buy a Dobsonian reflector. A 6" Dob costs about $300, an 8" about $400 and a 10" sells for about $700.

*For astrophotography, buy a Cassegrain. (Or talk to **Alan Pryor** or **Felix Luciano** about the refractors they use – but be warned: those 'scopes are *expensive!)* Cassegrains are generally more expensive per inch of aperture than Dobs are – but high-quality photos require high-quality equipment.

(Hey, you can take photos with your *phone* – but don't expect everyone to *ooh!* and *aah!* over the images it produces!)

You can, of course, use a SCT or Maksutov Cassegrain for observing as well as photography.

General Tip #1: *Whatever type of telescope you decide to buy, get the largest aperture you can afford.* There's an old saying, "Aperture Rules All." It isn't always true, but it's undeniable that, other things being equal, the larger the image the more you'll see.

General Tip #2: Buy from a reputable manufacturer. High-quality 'scopes are available at all prices, but this also refers to the quality of service you'll receive. Any FRAC veteran can help you here, but every issue of *Astronomy* and *Sky & Telescope* has ads from trustworthy manufacturers, and they periodically feature reviews of new telescopes on the market.

You should expect to pay at least $300 for a high-quality telescope. If you pay less than that, the tripod will be flimsy and too unstable to render serious observing possible.

General Tip #3: *Having purchased a new telescope, use it as often as possible.* No matter what kind of 'scope you buy, you'll have to learn how to use it. The more often you practice, the quicker you'll become comfortable using your new telescope.

And when problems arise – and they will -- FRAC has many experienced observers who know a lot about telescopes. You should ask for help whenever you need it. We may not always have the answers you're looking for, but we can point you toward someone who does.

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Jeff Hester Strikes Again

opinion article by Bill Warren

Jeff Hester, *Astronomy Magazine's* proudest and most vocal atheist writer, is at it again, this time with a vengeance. On p. 18 of his April, 2018 "For

Your Consideration" column, Hester wrote of telling students in his Astronomy 101 college courses about "the Great Deceiver…a flight of fancy" whose supposed existence "can explain anything." Belief in that Great Deceiver, Hester tells his students, fools people into thinking that religion, not science, holds the keys to understanding the universe, how it arose and how it works.

Scientific theories, on the other hand (Hester went on), are useful in ways that religion is not because they offer "explanations that could, in principle, be proven incorrect." He scoffs at the notion of *intelligent design* because it is just "a repackaged version of creationism" (which he detests), and incapable of being disproven or tested scientifically. "Whatever we might discover," he explained, "well, that's just what the Intelligent Designer decided to do."

Fast forward one month to the May issue of *Astronomy*, where, on p. 11, reader **Steve Inerman** responded to Hester's criticism of intelligent design.

"I would have been more impressed," Inerman wrote, "had he addressed the idea that, in a void without even space, where there was no place or space for time to elapse in, amid the infinite timeless nothingness, for no reason, and at no particular time, tons of energy exploded (and maybe 6 to 8 times more dark matter and maybe 15 times more dark energy) to create a huge amount of space. Randomly. Out of nothing."

Hester's reply (in part): "What caused the Big Bang?...Quantum mechanics (implies) that events require no direct cause…Most credible ideas describe the Big Bang as the result of quantum fluctuation...Theoretical physicists argue that absolute nothingness is unstable."

Let's see.

1. "Events require no direct cause." (Translation: We don't know how or why the universe, space and time suddenly sprang into existence out of nothing, but that's not important. All we need to know is that a "Great Deceiver" or "Intelligent Designer" had nothing to do with it.)

2. "The Big Bang (was) the result of quantum fluctuation" *(i.e., a temporary change in the amount of energy in a point in space. -Ed.)*. One wonders: By definition, absolutely nothing, not even empty space, existed prior to the Big Bang; *how could there have been a sudden change in the amount of energy in a point in space if neither energy, space nor anything else existed before the Big Bang?*

3. "Absolute nothingness is unstable." In other words, nothingness can randomly turn into matter, energy and space due to quantum fluctuation. We can believe it, Hester probably would say, because physicists who are much smarter than you or me have arrived at that conclusion after using logic, mathematics and/or computer model simulations to determine what absolute nothingness might be like *(although, I might add, it does not exist in our space-time universe. -Ed.).*

But why should physicists have theorized that nothingness is unstable? What difference does it make whether nothingness is stable *or* unstable? Here's why: If nothingness is stable, there would have been no reason for it to have suddenly turned into matter, energy and space. Physicists would have to find another theory to explain why the Big Bang occurred, and that theory – that an Intelligent Designer created the universe – is clearly unacceptable to them.

Merely saying that events require no cause doesn't make the question of why the Big Bang occurred go away, so they fall back on the explanation that it was the result of unstable nothingness suddenly turning into a universe. For evidence, they point to virtual particles that pop into and out of existence at the deepest quantum level. Like dark matter and dark energy, those virtual particles are theoretical and cannot be seen, but they can be detected by their effect on real particles.

Conclusion. *Astronomy* columnist Jeff Hester is important to this discussion because, with the recent passing of **Stephen Hawking** *(see pp. 1-2)*, he is the most outspoken atheist in astronomy.

Hester is a gifted writer, teacher and astrophysicist. Not content with promoting science, however, he delights in poking fun at anyone, even his fellow astronomers (including some *Astronomy* columnists) who believe in what he refers to as "the Great Deceiver." Hester's God is *science*, and anyone who believes otherwise is living in a dream world that does not exist.

"Most Christians I know believe in evolution and in a universe that was created by the Big Bang," letter writer Imerman wrote, adding that "Mr. Hester may be every bit as clever as he thinks he is,

(but) the rest of us are not nearly as lunkheaded as he thinks we are." And that's the point of all this.

It's one thing for Hester to air his pro-scientific views at every opportunity; that's his job, and he is very good at it. But it's something else again for him to deride the beliefs of astronomers, college freshmen, his readers and others who might regard science *and* religion as important roads to truth in their lives. That's not what he is being paid to do.

P. S.: Re my earlier statement that absolute nothingness does not exist in our universe: Even in the remotest vacuum in the universe where no more than one molecule of matter per square meter might be found, it exists in the otherwise empty space around it. Without space, there would be no universe. And conversely, without the universe there would be no space or anything else.

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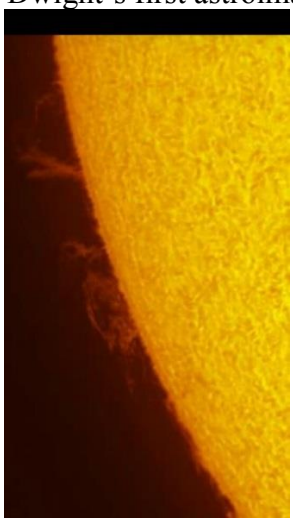
Below: Solar prominences imaged by **Dwight Harness** using one of **Stephen Ramsden's** h-alpha telescopes at Brooks Elementary School six yrs. ago. It was Dwight's first astroimage.



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Upper Right: NGC 3190 and the **Hickson 44 Galaxy Group**, four spiral galaxies in *Leo.* (Photo by **Alan Pryor.**) Pictured with a blue mag. 7.5 star nearby, elongated **NGC 3190** is the brightest of a quartet of four close spiral galaxies located halfway between 2nd-mag. **Gamma Leo** and 4th-mag. **Zeta Leo.** Those galaxies comprise **Hickson 44**, an A. L. Galaxy Groups and Clusters Program target. (The other three galaxies: **NGC 3187** to the upper right of 3190; **NGC 3193** to the upper left of 3190; and **NGC 3185** to the lower right and farther away.)

Says Alan, "I took this photo with a 17" telescope in New Mexico that I rented last month. I prefer to take images with my own equipment, of course, but I can hardly remember when we had clear dark skies on a Sat. night at Joe Kurz where I could attend."

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Errata. Re **yr. editor's** statement in the May *Observer* that "No one in FRAC owns an equatorial, motor-driven refracting telescope, so none of us has ever attempted astrophotography with a refractor": **Alan Pryor** notes that "For the record, **Felix Luciano** and I both use refractors for astrophotography. Felix has two refractors, an Astro-Physics refractor and a Takahaski refractor. I have a Takahashi just like Felix's.

"Felix's Astro-Physics refractor is good for objects that require a wide field of view. Our Takahaski scopes are very good for objects requiring a field of view of around 0.75º. Of course, you usually see me using an 11" SCT; it gathers more light, and it is good unless the object is large. For instance, you could not get half of **Andromeda Galaxy** in a photo with the 11".

At any rate, thanks, Alan – and **Erik Erikson** as well -- for pointing out the error. We try very hard to avoid such glaring mistakes in the newsletter; it will be interesting to see whether "Telescopes: Part 3" contains further examples of **yr. editor's** steady advance toward senility.

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