

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**; and Treasurer, **Truman Boyle**.

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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. Fri., Sept. 11: JKWMA observing, Site #3; **Sat., Sept. 12:** meal and pool party (**Bill Warren's** house at 1212 Everee Inn Rd. in Griffin, pool time from 5-7 p.m., meal at 7 p.m., brief meeting afterward, stay as long as you want); **Sun., Sept. 13:** public solar observing (1 a.m.-4 p.m., The Garden in Griffin); **Sun., Sept. 27:** total lunar eclipse public observing at The Garden (8 p.m.-1 a.m.).

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President's Message. I want to thank everyone who attended our pizza party and public observing in August. Your support in our time of need means more to me than you could possibly imagine. You responded to my request for increased attendance to boost our chances of overtaking the Houston Astronomical Society in the number of Outreach pins awarded – **Bill** says we're up to 34 pins now, and tied with them for 1st place nationally.

I wasn't able to spend as much time with each of you at the meeting and observing as I wanted to, but I was busier than a one-armed pizza twirler. (I'm not complaining; it was a very special occasion, and one that I'm very proud of. I just wish I could have spent more time individually with each of you.)

I want to welcome FRAC's newest members, **Alison Rudzinski** of Fayetteville and **Jeremy, Sarah, Emily & Delilah Milligan** of Senoia. They joined FRAC that night, and we're looking forward to getting to know them better, and vice versa.

Alison and the Milligans, please let us know how we can help you to enjoy your membership to the fullest. That's what we're here for.

-Dwight Harness

Vice President's Message. When, after serving as club president for five years, I decided to step down from the post, my first choice to succeed me was **Dwight Harness**. I knew he'd be good, but I had no idea how good until he took office.

Initially, at least, I thought that some of the directions Dwight wanted to take the club were unnecessary or unrealistic, but I supported him because, frankly, the club had grown stale under my leadership. It was time for a change. So let's see how Dwight's vision of FRAC's future has played out so far.

1. We'd known for years that, with the Coxses in their 80s, we'd eventually lose our Cox Field observing site. Dwight had suggested several times that we try out Joe Kurz Wildlife Management Area (JKWMA) as a replacement site. But it was farther away from Griffin, the central hub of our membership, so I rejected the idea without ever having seen JKWMA.

Shortly after Dwight became president, we changed our observing site to JKWMA, and it was one of the best decisions the club ever made. The horizons are superb, and **Larry Higgins** (who has been in astronomy for 2-1/2 decades) says it's the darkest site he's ever seen. Me too.

The score: Dwight 1, me 0.

2. We had been holding our monthly club meetings and lunar/planetary public observings on separate nights at a site on UGa-Griffin's main campus for several years. Dwight suggested that The Garden would be a better site, and that we could combine the meeting and observing into one session every month. Again I silently disagreed: our members were comfortable with the main campus site, so the move was, I thought, unnecessary. But I hadn't thought it through properly, and I was wrong. The Garden is a darker observing site, and it has everything we need, including restrooms, a great meeting site and heating/ac. And by combining our meetings with public observings before and after, we have increased member participation in those observings, including members who might not come to a public observing on a separate evening.

The score: Dwight 2, me 0.

3. Dwight wanted FRAC to apply for the free Library Telescope to be given away in July to one club in each of the A. L.'s ten regions. I thought, *There's no way we can win, not with so many other, larger clubs in our region.* But Dwight said, "Nothing ventured, nothing gained," so I sent in FRAC's application. And we won it.

The score: Dwight 3, me 0.

That's what usually happens when, like me, you think small.

Dwight's latest project: having a FRAC observatory at The Garden, or maybe at The Cove or elsewhere. It may or may not come to pass, but not for a lack of vision or effort on his part.

The biblical **King Solomon** wrote, "Where there is no vision, the people perish." (*Proverbs 29:18*) Like him, Dwight understands that progress results from visions of what can be accomplished by people working together.

-Bill Warren

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Last Month's Meeting/Activities. An incredible 26 people -- including members **Dwight Harness; Ron Yates; Denise & Truman Boyle; Cynthia Armstrong; Olga & Carlos Flores; Cherrie, Sarah & David O'Keeffe; Dawn Chappell; Steven "Smitty" Smith; Felix Luciano; Orren Haynes; Larry Higgins; Aaron Calhoun; Erik Erikson;** and yr. editor and visitors **Dylan, Ethan & Eisley Higgins** (Larry's son and grandchildren); **Alison Rudzinski;** and **Jeremy, Sarah, Emily &**

Delilah Milligan – attended our "Perseids, Pluto & Pizza Party" and lunar/planetary observings at The Garden on Aug. 13th. Aaron received his Stellar Outreach certificate, and he, yr. editor, Felix and all of the Milligans received Zombie awards.

Fifteen members – **Aaron Calhoun; Ron Yates; Dwight Harness;** and yr. editor (both nights); **Erik Erikson** (Fri. night); and **Joe Auriemma, Truman Boyle and Jeremy, Sarah, Emily & Delilah Milligan** (Sat. night) – attended our Aug. JKWMA observings. On both nights, the sky was like the little little girl with the little little curl in the very very middle of her forehead: when it was good, it was very very good, but when it was bad, it was horrid. We (briefly) watched the International Space Station fly past; we saw a fireball and a couple of tardy Perseid meteors; Aaron observed a few more Messiers; and Joe showed us **Saturn** and its incomparable rings at 600X. Things like that – and having a good time with good friends – make for very good evenings under the stars.

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This 'n That. **Ron Yates** joined FRAC last November. Since then, he has impressed one and all with his knowledge of astronomy, his incredible astrophotography and his friendly, outgoing nature. He recently became our new observing chairman.

Unfortunately, Ron is moving back to the Louisville, Ky. area he came here from, and FRAC is losing one of its brightest new stars.

We've enjoyed getting to know you, Ron, and we wish you the very best of health, happiness and clear skies for your astrophotography. Our loss is the Louisville Astronomical Society's gain.

*It's happened again – the **Mars** hoax, that is. This is the 12th time in the past 13 years that essentially the same fraudulent announcement has been sent out by mass messaging – always in July or August.

The latest Facebook message reads, "12:30 August 27th you will see two moons in the sky, but only one will be the moon. The other will be Mars. It won't happen again until 2287. No one alive has ever witnessed this happening." The message is accompanied by a doctored photo showing two **Moons** side-by-side in the sky above a church. (Last year it was the Moon and an equally large Mars above a monastery in Russia.)

Well, at least the hoaxster's last sentence was correct: we've never witnessed such an event, because it's never happened before and never will. (If you're new to FRAC or want to refresh your memory, you can read about the Mars hoax by going to our website and looking up the Feb. 2015 issue. It's on pp. 4-5.)

Here's the kicker: according to *Astronomy's* "Cool Facts" #294 – see below -- on July 31, 2018 Mars will be just 35.78 million miles from Earth. That's the closest it's been since the hoax began, but Mars still won't be as large as the Moon in the night sky. It will be an orange "star," and nothing more than that. (Cool Fact #125: At its largest in our naked-eye view, Mars is the size of a quarter held up by someone standing three football fields away.)

*By far the most fascinating single issue of any astronomy-themed magazine of all time is the March, 2015 issue of *Astronomy*. Because it was the 500th issue, the editors devoted practically the entire magazine to "The 500 Coolest Things About Space."

Here, in the form of a little quiz, are some more of those 500 coolest facts. (Answers on p. 6.)

1. How long would it take to walk to the **Moon**?
2. On average, how large is a black hole?
3. If the Earth were to suddenly become a black hole (which is impossible), how large would it be?
4. Which of the planets in our solar system rotates the slowest?
5. Which planet has the fastest wind speeds?
6. How large is the Earth compared to the **Sun**?
7. Why is the sky blue?
8. What famous astronomer lost his nose in a duel?
9. How bright is the sunlight that **Pluto** receives?
10. How many atoms are there in the universe?
11. What is the only planet in our solar system with a density less than water?
12. What is the oldest star?

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Upcoming Meetings/Activities. We'll have just one club observing at JKWMA in September, on **Fri., Sept. 11th** at Site #3.

On the following evening, **Sat., Sept. 12th**, we'll have a meal and pool party at **Bill Warren's** house at 1212 Everee Inn Rd. in Griffin. (*Please Note:*

This event will take the place of our regularly scheduled club meeting in September. We will NOT meet at The Garden on Thurs., Sept. 10th.) We'll eat at 7 p.m., but the pool play will begin at 5 p.m. Bring the entire family: we have a lot of pool toys for the kids, so bring swimsuits for all. We don't have water wings, so bring them along for small children who may need them, and plan to take a dip yourself (in the pool, that is, not a dip of snuff or chewing tobacco). Or, you can just lie around in a floating pool chair. (Bill has four of them.)

After the meal, we'll have a very brief meeting – no more than 10 min. at most – and **Truman** will give out door prizes. Stay as long as you like afterward, whether swimming or just sitting around talking.

As for what food to bring – **Dwight** will bring KFC chicken and liquid refreshments (non-alcoholic, of course). FRAC will supply cups, plates, eating utensils, napkins, ice, etc., so just bring one item of the sort that you'd bring to a church picnic: another meat item or more chicken; potato salad, beans, chips, congealed salad, dessert, or any specialty item that you like to prepare for such events.

So holy guacamole!, by all means plan to come, swim, eat like there's a famine coming or you're storing body fat for winter hibernation, and let your family spend some quality time with us, your other (FRAC) family.

To get to Bill's house from, say, Hampton on U. S. 19/41, go south past the stoplight at Ga. 92 (to Fayetteville), and stay on the 4-lane past the Griffin exit, the Ga. 16 (Griffin-Newnan) exit and the Ga. 362 exit (Williamson Rd.). Turn left at the stoplight at Airport Rd. Turn right at the 4-way stop at Everee Inn Rd. Go one block, and turn left at Roberts St. Bill's 3-car paved driveway is the first one on the left. Either park there, or drive past, turn around and park beside his backyard.

Bill's address is: 1212 Everee Inn Rd., Griffin, GA 30224. His GPS coordinates are: 33° 13' 15.37" N, -84° 16' 54.77" W. Or, 33.220933, -84.281907. (Thanks, **Tom Moore**.)

When **Dwight** learned that "The Friends of the Garden" group is hosting a public art show at The Garden on **Sun., Sept. 13th**, he volunteered FRAC to piggyback on that event by holding a public solar observing along with the other activities they will be conducting.

We'll set up a FRAC table with lots of free astronomy handouts; we'll give out free solar

sunglasses; and we'll show visitors the **Sun** every way we can.

We hope you'll make plans to attend on Sept. 13th: the event will be highly publicized and will draw a *big* crowd. It will begin at 1 a.m. and run until 4 p.m., but we'll get there around noon to set up. Bring your filters and 'scope if you have them, but if you don't, come anyway: we need members to give out solar sunglasses and astronomy handout materials, and to remind our visitors of the total lunar eclipse observing that we'll conduct at The Garden on Sept. 27th. (See below.)

Finally, with a **total lunar eclipse** occurring on the evening of **Sun., Sept. 27th** (*see also pp. 5-6*), we'll celebrate the event with another public observing at The Garden in Griffin. A large crowd is expected to attend this well-publicized event, so all telescopes and their owners will be greatly appreciated.

We'll open the gates at 8 p.m., and we'll stay as long as you like. (The visible portion of the eclipse will be over around 12:30 a.m.) We won't serve refreshments this time, but the restrooms will be open. The last paragraph of the eclipse article has suggestions regarding what to bring along in order to enjoy the eclipse to the fullest in comfort.

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The Planets in September: Part 1. Delight At Night. **Saturn** (mag. 0.5) will be up all night throughout September, giving you plenty of time to enjoy its highly visible rings, which are tilted 24° to our line of sight. You'll need a telescope to see them, though: in binoculars, Saturn will look like a tiny football.

Neptune (mag. 7.8) and **Uranus** (mag. 5.7, or 15 times as bright as Neptune) will be up all night, too. You'll see them in binoculars as blue and blue-green "stars," respectively; in a telescope you'll identify them by their tiny but clearly non-stellar disks of the same colors. Neptune can be found about halfway between the 4th-mag. star **Lambda Aquarius** and 5th-mag. **Sigma Aquarius**. Uranus lies in the same binocular field as 5th-mag. **Zeta Pisces**. The Sept. issue of *Sky & Telescope* (p. 49) has excellent finder charts for both of them.

Part 2. Gone By Dawn. **Venus, Mars and Jupiter** will continue their celestial dance in September. Venus (mag. -4.8) will be a blazing morning star in the E pre-dawn sky. Mars (mag. 1.8) will be 10° – a fist-width held against the sky – below and to the left of Venus, its characteristic

orange color immediately recognizable. Jupiter (mag. -1.7) will be the last to rise.

An hour before sunrise on **Sept. 25th**, Jupiter will be as far below Mars as Mars is below Venus, the three of them forming almost a straight line. (Mars will be a bright "double star" with mag. 1.3 **Regulus (Alpha Leo)** on that date.

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Snobbery, Astronomy-Style

article by **Bill Warren**

All right, fellow FRACsters, here's a question for you: *Do you own a pair of binoculars or a telescope?* Let me put it another way: Raise your hand if you don't own a telescope or binoculars.

(Pause.)

Ken Walburn, I know for a fact that you have a 10-in. Dobsonian reflector, so why is your hand up? (Another pause.)

Oh. It's the room on the left across the hall, just beyond the water fountain. Don't forget to wash your hands afterward.

Let's see, where was I? Oh yes.

Two facts: 1. You're a member of FRAC. 2. That makes you an astronomer. But you're also an astronomer because you're interested in the universe out there. Either that's true, or when you joined FRAC you thought you were joining a gardening club because of where we hold our meetings. (*Hey, you weren't entirely wrong: like all clubs, FRAC has some budding geniuses, and some blooming idiots.* –Ed.)

In astronomy, everyone starts out at Square One with an interest in (but little understanding of) the solar system and what lies beyond it. Astronomy clubs such as FRAC exist to provide opportunities for members to grow as astronomers. How much (and how quickly) you grow depends on how deep your interest is. And that's one of the nice things about astronomy: personal growth isn't a prerequisite for considering yourself an astronomer. You're already an astronomer, whether you think you are or not, and there's no timetable for beginners to progress to Square Two, whatever that is.

Basically, there are two kinds of amateur astronomers, *observers* (those who study the sky through a telescope, binoculars or naked-eye); and those who don't. (They're called *armchair astronomers*.) Some rather snobbish observers

consider themselves superior to armchair astronomers, but it ain't so, Joe. **Stephen Hawking** hasn't done any visual observing in many, many years, but you'd be hard pressed to convince anyone that he needs to get out and observe regularly. The idea that you need to observe in order to be considered an astronomer is as silly as the notion that astronomy is for men only. (Regarding the latter, ask **Tom Moore's** daughter **Katie**: she runs the Smithsonian's sidewalk observatory in Washington, D.C.)

Another form of astronomy snobbery involves observers who, because they look at the sky through binoculars or a telescope, regard naked-eye observing as unworthy of them. But for most of astronomy's history humans studied the night sky using only their eyes. And from 1976 until his death in 2010, **Jack Horkheimer** hosted a *very* popular weekly 5-min. late-night TV show, "Jack Horkheimer: Stargazer." In each brief segment Horkheimer, with the fervor of a side-show barker, urged people to go outside *tonight!* and see with their own eyes how fascinating the night sky really is. He never suggested using binoculars or a telescope: his message was, *You don't need to invest a single penny to see how awesome our universe is; all you need to invest is a few minutes of your time.*

I remember one show in which, with his usual passion, Horkheimer told us why it was vitally important for us to go out right after the show and find the stars **Zubenelgenubi** and **Zubeneschamali** (**Alpha** and **Beta Libra**, respectively). If we did, he insisted, it would change our lives forever. (And it *could* do that, in the sense of sparking an interest in stargazing.)

Bottom line: Astronomy is whatever you want it to be, a casual interest or an abiding passion. But whatever the case, you're an astronomer as long as you don't allow that spark of interest or flame of passion to die.

Don't forget that.

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September's Total Lunar Eclipse

On the evening of **Sunday, September 27th**, you can see one of nature's most stunning and beautiful displays, weather permitting: *a total lunar eclipse*. It will last from 8:40 p.m. until 12:55 a.m., but the

best time to watch it will be between 9:07 p.m. and 12:27 a.m.

Lunar eclipses occur when, in the course of orbiting the **Sun**, the Earth moves into a position directly between the Sun and the **Moon**, blocking sunlight from reaching the lunar surface for a few hours. It happens between 2-5 times a year, always during a Full Moon, and most of them are partial eclipses, not total. We don't see all of those eclipses, for a variety of reasons.

The total lunar eclipse on September 27th will be special, and not just because the entire Moon will undergo dramatic color changes while it is immersed in Earth's shadows. On that date, the Moon will reach its perigee, or closest point to the Earth in its orbit, *while the eclipse is in progress*. As a result, it will be 31,000 mi. closer to the Earth than when it is at its farthest distance from us. This one will be the largest eclipse you'll ever see – a *"Super Moon" in total lunar eclipse!*

Total lunar eclipses consist of five stages, the first and last of which are barely noticeable.

First, there is the *penumbral phase*, in which Earth's fainter outer shadow, or penumbra, will begin to cross the Moon's face at 8:40 p.m. You won't notice it until it's about halfway across, at which time the Moon's left side will begin to darken slightly.

At 9:07 p.m., the second stage, or *partial eclipse*, will commence, and that's when the fun starts. This portion of the eclipse will look like something large is ever-so-slowly nibbling away at the lunar surface and changing its color. This phase marks the point where the Moon enters Earth's dark inner shadow, or umbra.

The Moon will continue to darken and change color as that shadow gradually expands across the lunar face until, at 10:11 p.m., the third stage -- *totality* -- begins. At that point, the entire Moon will be engulfed in reddish or orange shadow. Totality will last for an hour and 12 minutes.

At 11:23 p.m., the Moon will reverse the process and begin moving out of the dark umbral shadow, marking the fourth stage: another partial eclipse. The Moon's edge will reappear, bathed in sunlight that continues to expand until the shadow is completely gone by 12:27 p.m.

By then, the Moon will be full again. All that will be left of the eclipse is the faint penumbral shadow that marked the beginning of the eclipse.

Best advice here (if you can't make it to our public observing at The Garden) is, go outside around 9 p.m. on Sept. 27th to watch the partial eclipse begin, and watch it grow until the Moon reaches totality shortly after 10 p.m. After that, stay outside until you've seen enough, then call it a night and go indoors.

Other advice: Don't forget to use insect repellent. Sit in a reclining lawn chair, not a straight-back chair. Use binoculars or a telescope (if you have them); it will greatly enhance your appreciation of what you're seeing. And while it will still be hot during the daytime in late September, the temperature will drop before the eclipse begins, so have a blanket or warm clothing available in case you need it.

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Answers to Astronomy's "Cool Facts" questions on p. 3:

1. Assuming a walking speed of 3 mph with no stops along the way for meals, sleeping or anything else, it would take nine years to walk to the **Moon**. (Cool Fact #358)

2. The average black hole is 18 miles in diameter. (#374) (*That's pretty small for something that is capable of devouring entire galaxies. –Ed.*)

3. If Earth suddenly became a black hole, its entire mass would be compressed into an area measuring ½ inch in diameter. (#379)

4. **Venus** rotates at a speed of 4 mph. (#353) (*Earth rotates at 1,000 mph, and according to Cool Fact #439 Venus's rotation rate has slowed by 6.5 min. in the past two decades or more. –Ed.*)

5. The winds on **Neptune** blow at speeds of more than 1,400 mph. (#245) (*On Earth, tornadoes have generated wind speeds as high as 300 mph. –Ed.*)

6. If Earth was the size of a tennis ball, the **Sun** would be a globe 24 feet in diameter, a half-mile away. (#13) (*And according to Fact #314, if the Milky Way were the size of a tennis ball, Andromeda Galaxy would be another tennis ball 5.6 mi. away. –Ed.*)

7. Here's why the sky is blue during the daytime (#198): Air molecules in the atmosphere scatter the blue and purple portions of the sunlight we receive more than red and yellow light. (*And since there is more blue than purple light, the sky is blue. –Ed.*)

8. As a young man, the great Danish astronomer **Tycho Brahe** (1546-1601) lost his nose in a duel

that stemmed from an argument over a mathematical formula. He wore prosthetic noses made of wood, copper and brass. (#437) (*It was an early example of accessorizing: a nose to suit every occasion. –Ed.*)

9. The sunlight that **Pluto** receives is 300 times brighter than the Full Moon as seen from Earth. (#404)

10. The universe – or at least the part of it that we can see or detect – contains 2.4 quinvigintillion (10^{80}) atoms. (#402) (*This isn't a "Cool Fact," but we thought we'd add it because you probably were wondering about it: the body of an average adult male contains about 7×10^{27} atoms. That may appear at first glance to be uncomfortably close to the 10^{80} atoms in the entire observable universe, but it isn't: each of those additional 53 zeros in the 10^{80} superscript represents ten times as much as the previous number. –Ed.*)

11. **Saturn** is less dense (and therefore lighter) than water. If you could find a large enough container of water, Saturn would float in it. (#68)

12. Referred to as the "Methuselah Star," **HD140283** in the constellation *Libra* dates back to the beginning of star formation about 200 million years after the Big Bang. Its age is thought to be 14.5 billion years, plus or minus 800 million years. (#88) (*The margin of error is necessary because the universe is only 13.8 billion years old.*) *Regardless of the problems involved in dating the Methuselah Star, however, no other star has been found to be comparable in age to HD 140283. – Ed.*

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Errata. The photo of **M17** on p. 6 of the August issue of the Observer was taken by **Alan Pryor**, not **Felix Luciano** as stated.

In the recent "Star of Bethlehem" Special Edition of the *Observer*, **Luke** was incorrectly described as a "largely uneducated...fisherman." Wrong. Luke was a doctor, either Greek or a Jew living in Greek-controlled Antioch, Syria, until he became an evangelist who traveled with the apostle **Paul**. Luke is regarded today as a highly intelligent man who recognized the importance of historical detail and accuracy in his writings.

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