THE

FLINT RIVER OBSERVER

NEWSLETTER OF THE FLINT RIVER ASTRONOMY CLUB

An Affiliate of the Astronomical League

Vol. 20, No. 3 May, 2016

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Please notify **Bill Warren** promptly if you have a change of home address, phone 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., April 29: Gordon State College "Relay For Life" walkathon (Summer Field in Barnesville, 6 p.m. until whenever; **Fri.-Sat., May 6-7**: JKWMA observings (Site #1, at dark); **Thurs., May 12**: FRAC meeting/public lunar & planetary observings (The Garden, 7-10 p.m.).

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President's Message. When one daughter went off to college and another got married, I thought my life would get less complicated. I pictured **Betty** and me sitting on the front porch in the evening like Andy Taylor and Aunt Bee, churning home-made ice cream and talking about who was doing what in Mayberry. It hasn't been that way, though.

I recently bought a new computer and phone, and getting them to work the way I want them to has been a nightmare. Sometimes I think I'd be better off communicating by smoke signals or a tin can telephone.

Add to that getting a new job that is very different from the work I've done for many years, and you're looking at a candidate for **Mick Jagger's** *19th Nervous Breakdown*. I've gone from "Dish Tec" to a nervous wreck.

Still...I've been blessed in so many ways that I have no right to complain about anything. I wouldn't trade places with anyone. I hope you feel the same way about your life and yourself.

Life is not always easy, no matter who you are, but that doesn't matter. What matters is what you do with what life gives you.

And with that happy thought, I'll turn it over to Bill.

-Dwight Harness

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Last Month's Meeting/Activities. Eleven members attended our April meeting: **Truman Boyle; Carlos Flores; David Haire; Tom Moore; Aaron Calhoun; Joe Auriemma; Dwight Harness; Kenneth Olson; Dan Pillatzki; Erik Erikson;** and **yr. editor**. Carlos & Erik received their Stellar Outreach certificates, and we watched a very nice dvd on "The Spring Sky."

The good news regarding our April JKWMA observings: the sky was clear both nights. The bad news: only four members showed up: **Dwight Harness** and **Jeremy Milligan** (Fri. night) and **Aaron Calhoun** and **Steve Hollander** (Sat. night).

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This 'n That. Our sympathies are extended to the families of **Wayne Gardner**, whose mother passed away in North Carolina at age 95, and **Larry Higgins**, whose uncle passed away at age 85 at Brightmoor Nursing Home in Griffin.

*As we often point out in these pages, FRAC membership requires keeping your priorities in order. For example, **Cherrie O'Keeffe** was slated to receive her Basic Outreach certificate and pin at our April meeting, but a more pressing event required her presence elsewhere, namely, the birth of her and hubby **David's** first grandson. **Liam**

Norton weighed in at 6 lbs., 2 oz. and measured 19 in. at birth, and he and his mom, **Kristen Norton**, are doing fine. Grandmother Cherrie, Grandpa David, **Auntie Sarah** and **Uncle Jeff** couldn't be prouder! If they miss next month's meeting, it probably will be because they're out shopping for a pre-toddler telescope.

***An important reminder regarding JKWMA usage**: If you're the last person to leave, be sure to close the gate behind you and lock the combination lock **to the other lock**, not to the chain.*

The Downloads link on our website contains directions to JKWMA from Griffin and procedures for FRAC's use of the facility. (Those guidelines also appear on p. 5 of this newsletter.) All members who attend our JKWMA observings are urged to familiarize themselves with those procedures and follow them precisely.

*Once upon a time, FRAC members got a sizable discount on their annual subscriptions to *Sky & Telescope*. Over the years, though, FRAC somehow lost its club registration with *Sky & Tel* and we stopped getting that discount.

Now, however, thanks to the tireless efforts of **Louise Warren**, FRAC is once again registered with *S&T*. Next time you renew your subscription, you'll pay $32.95 instead of the regular price of $42.95.

To renew or subscribe for the first time, call *Sky & Tel* at 1-800-253-0245. Tell them that you're a member of the Flint River Astronomy Club, that our club is registered with them and you want the discount that our members are entitled to.

If you place your order via the Internet: 1. Go to www.skyandtelescope.com. 2. Click on Login. 3. Type in your Username and Password. (Or, if you have never registered with them before, click on Register, then type in your Username and create a Password.) 4. If you have problems, call *Sky & Telescope* at 1-866-644-1377 or e-mail them at help@skyandtelescope.com.

As for *Astronomy Magazine* – we're checking into it and will let you know when we find out whether they offer a discount for club members.

*****Re last month's article about the solar system: When the International Astronomical League met in 2006 they defined, not just planets, but everything else in the solar family. Here's a (simplified) look at the definitions they came up with.

Planets orbit the **Sun** or another star; their gravity has rounded them into roughly circular shape; and they have cleared their orbits of other similar bodies except moons.

Moons orbit the planets.

Dwarf planets are circular, but they do not orbit the planets. Presently there are only five dwarf planets: **Ceres, Pluto, Haumea, Makemake** and **Eris**. (In 2008, the IAU added a subcategory: *Plutoids*, or dwarf planets orbiting outside -- most of the time, anyway -- the orbit of **Neptune**. That includes all of the dwarf planets except Ceres, which is in the asteroid belt.)

All other objects – asteroids, comets and the "moonlets" that comprise the rings of **Jupiter, Saturn, Uranus** and Neptune – are now classified as **SSSBs (Small Solar System Bodies).**

Those definitions are not entirely beyond question. For example, both moons and moonlets orbit planets, and many asteroids are larger than the Martian moons **Deimos** and **Phobos**.

Rather than criticizing the IAU, however, we're merely pointing out the difficulty of defining the types of objects found in our solar system with any precision. All in all, we think the IAU did a good job of it.

*Here are a couple of tidbits from **Aaron Calhoun** to give you a sense of how large our little corner of the universe is:

1. If you could travel at a speed of a light-year a second, it would take you more than a day – actually, about 28 hours -- to go from one end of the **Milky Way** to the other.

2, To travel to **Andromeda Galaxy** at the same speed – a light-year per second -- it would take you 29 days to get there.

*As **Fred Espenak** points out in the May '16 issue of *Sky & Telescope* (p. 45), spring is the season of celestial tails.

First, of course, there are the long tails of *Ursa Major*, the Great Bear, and *Ursa Minor* (the Little Bear). Bears don't have long tails, of course, so how did these two get theirs? According to legend, Espenak says, their stubby little tails were stretched out of shape when the gods flung them into the heavens by their tails.

Then there are the tails of *Draco*, the Dragon, *Hydra*, the Sea Serpent, and the stinger in the tail of *Scorpius* (the Scorpion) that ended the earthly life of *Orion*, the Hunter.

The brightest star in *Cygnus*, the Swan, is **Deneb**, which is Arabic for "tail" (as in tail feathers). And the little witch's hat asterism of naked-eye stars that today forms the Egyptian **Queen Berenices's** hair (*Coma Berenices*) was once regarded as the tuft of hair at the end of **Leo's** upraised tail.

On the other hand – or tail, in this case – *Leo Minor*, the Little Lion; *Corvus*, the Crow; and *Canes Venatici*, the Hunting Dogs – all of those spring constellation animals are tailless.

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"Where Leo awaits King Sol in dog-days' reign
And Regulus shines diamond-like and bright,
When springtime walks and summer smiles again
Till harvest moon beams yellow in the night;
Six suns, with four stars sparkling in its train,
Like question-mark which faces to the right.
Or secret symbol written clear and plain,
A starry sickle glitters in men's sight."

-Charles Nevers Holmes
The Starry Sickle (1916)

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***Trivia Questions**. **1.** Early stargazers saw the **Milky Way** as a cloud-like river or road in the sky; who was the first astronomer to see it as a huge mass of individual stars? **2.** How far away is the *Voyager I* spacecraft that was launched in 1977? **3.** How much total mass does the asteroid belt contain? **4.** What is the only constellation named for an actual person? (Answers on pp. 4-5.)

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Upcoming Meetings/Activities. We'll participate in Gordon State College's "Relay For Life" cancer walkathon at Summers Field in Barnesville on **Fri., April 29th**. The event will begin at 6 p.m., and will last all night. We aren't expected to stay the whole time, of course; we'll simply have our telescopes available to show walkers the wonders of the night sky. Stay as long as you like, and leave whenever you wish. It's for a wonderful cause, though – celebrating cancer survivors and raising money to combat that disease. You'll be very glad you came.

Our JKWMA observings will be held at Site #1 on **Fri.-Sat., May 6th-7th.**

Our club meeting and public lunar & planetary observings will be at The Garden in Griffin from 7-10 p.m. on **Thurs., May 12th.** The meeting will begin at 7:30.

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The Solar System in May. Mercury's solar transit on May 9th (see **Aaron Calhoun's** article on p. 4) will be the star of the planetary parade this month. Other than that, though, Mercury will be too near the **Sun** to be seen.

Mars will rise 2 hrs. after sunset on May 1st, and progressively earlier after that. On May 22nd, the Red Planet will be closer to us than it's been in 11 years. It will be roughly as large and bright as **Jupiter** in telescopes. See if you can see dark surface features and/or the polar ice caps on Mars during May. Use high magnification.

(By the way: In case you receive an anonymous e-mail or Facebook message telling you that, on May 22nd, Mars will appear as large as the **Moon** in the night sky – don't believe everything you read on the internet or your iPad. Like every hoax, the Mars announcement that goes around every year contains a grain of truth: Mars as seen in a telescope will be as large as the Moon as seen naked-eye. To the unaided eye, however, Mars will be no larger than the stars around it.)

Jupiter (mag. -2.3) will be up long past bedtime in May for most folks – but not us hardy astronomers. On the evening of May 7th, there will be a double shadow transit of Jupiter, with **Io** and **Callisto** casting their shadows onto the planet and looking like Mercury crossing the Sun from 12:39 p.m. until 1:42 a.m.

Saturn (mag. 0.1) will rise about 45 min. after sunset in May. On May 8th, it will lies just 8° – less than a fist-width held against the sky at arm's length -- NE of Mars; by the end of the month it will be a spread pinky-to-index finger-width SE of Mars. Saturn's rings will be 26° from edge-on, so our view of them will be excellent. Telescopically, look for the tiny black ribbon of the **Cassini Division** in the rings. (As with Mars, use a high-power eyepiece.)

Venus, Uranus & Neptune won't be visible in May.

The **Eta Aquarids meteor shower** may produce as many as 60 meteors per hour at peak on the mornings of May 5th-6th. The Moon won't be a problem for early risers. The radiant will be in the ESE sky, but Eta Aquarids meteors will be brightest wherever your sky is darkest.

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"For many years, (**Pluto**) was thought to be similar in size to **Mars** and **Mercury**. This changed in the late 1970s when Pluto's largest moon, **Charon**, was discovered. Astronomers measured both the orbital period of Charon and its distance from Pluto, and from this, computed the combined mass of Pluto and Charon. They found that the combined mass was less than that of the **Moon**."

-Richard Schmude, Jr.

Uranus, Neptune and Pluto and How to Observe Them (2008)

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Calhoun's Corner: Mercury Crossing the Sun by Aaron Calhoun

At 7:13 a.m. on Monday, May 9th, **Mercury** will begin a 7-1/2 hour march across the face of the **Sun**. Such events are called *transits*, and they are hardly common: the last Mercury transit was ten years ago in 2006, and the next one will be on Nov. 11, 2019. This year's transit will end at 2:41 p.m. when Mercury passes beyond the Sun's face. The midpoint of the transit will be at 10:58 a.m.

Unfortunately, you'll need a telescope and a solar filter to watch the transit.

A telescope is necessary because Mercury is too small and far away to be seen against the Sun without optical assistance. We see it naked-eye when it's up in the early morning or late afternoon sky because it is much brighter than the blue sky around it. Against the Sun's backdrop, however, its tiny size is revealed.

A white-light solar filter is necessary to protect your eyes from the Sun's overwhelming brightness. Wearing sunglasses offers no protection at all, and looking at the Sun even momentarily through binoculars or a telescope without a solar filter can cause permanent blindness.

In your telescope, Mercury will appear as a small black dot making its way very slowly across the Sun's face. There may be sunspots present, too – magnetic storms on the Sun's surface; if so, you'll easily see the difference between Mercury's perfectly round disk and the sunspots' irregular shape and grayish penumbra surrounding the black center.

Both Mercury and **Venus** occasionally transit the Sun in our view because they are closer to the Sun than we are. Mercury transits are more common than Venus transits because Mercury is closer to the Sun and orbits it more rapidly.

Mercury transits happen only in May or November – within a few days of May 8th or Nov. 10th. This is because in May Mercury is at its farthest point from the Sun (called *aphelion*), while in November it is at its closest point, or *perihelion*. May transits occur at intervals of 13 or 33 years, and November transits at intervals of 7, 13 or 33 years.

To astronomers, watching Mercury transit the Sun is more than seeing a little black dot move across a larger white ball of light. It is seeing an object that is 60 million miles away in space and only 1-1/2 times as large as our Moon cross in front of a star that is a million miles in diameter and 93 million miles away.

Trivia concerning Mercury transits:

*The first person to observe a Mercury transit was the French astronomer and priest **Pierre Gassendi**, in the year 1631.

*On June 3, 2014, the *Curiosity* Mars rover observed Mercury transiting the Sun. It was the first time that a Mercury or Venus transit has ever been observed from a celestial body besides Earth.

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Answers to Trivia Questions on p. 3. **1**. In 1610, **Galileo** aimed his telescope at the **Milky Way** and saw stars "so numerous as to surpass belief." But everything non-stellar that he saw surpassed belief. All of us experienced that same sense of wonder the first time we looked in a telescope and saw the **Moon**, a planet, nebula, galaxy or star cluster.

2. *Voyager I* is now 12.3 billion mi. from Earth **–** four times as far from us as **Pluto**. To reach a point as far away as **Proxima Centauri**, the nearest star besides the Sun, *Voyager* will have to travel 48,000 times farther out in space.

3. The total mass of the asteroid belt is less than 5% of the Moon's mass. Half of that mass resides in just four asteroids: **Ceres, Vesta, Pallas** and **Hygiea**. Ceres alone accounts for 1/3 of the total mass of the asteroid belt. (That's why it's classified as a dwarf planet.)

4. *Coma Berenices* is Latin for "Berenice's hair." The constellation was named for a real person, ancient Egypt's **Queen Berenice** (see p. 2). When her husband, **Ptolemy III**, went off to wage war in the 3rd century B.C., Berenice promised the gods that, if they spared Ptolemy's life in that conflict, she would shave off her lovely braided

hair. And when Ptolemy returned safely, he was appalled at what she had done. His anger was appeased, though, when his court astrologers told him that the gods had placed Berenice's hair in the heavens as a lasting tribute to her love for him.

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Guidelines for FRAC Usage of JKWMA

We conduct our monthly deep-sky club observings at Joe Kurz Wildlife Management Area (JKWMA), a 3,700-acre game management and hunting area in Meriwether County. The facility is operated by the Ga. Dept. of Natural Resources, and its use is strictly regulated.

FRAC has worked out with the rangers the following guidelines for using JKWMA. Whether you observe at Joe Kurz regularly or occasionally, it is important that you follow these procedures carefully. Failure to do so could result in our being denied permission to use JKWMA.

1. *Do not go out to JKWMA on any night except the scheduled Fri.-Sat. observing dates announced in our monthly newsletters and on our website.* Those are the only nights that we have permission to be there.

2. **Hunting Season**. The hunting season at JKWMA runs roughly from mid-August through mid-March. *During that period, the gate is left open at night. Do not close it when you enter or leave.*

3. **JKWMA's Closed Season**. Between mid-March and mid-August, hunting is not permitted at JKWMA. The facility is closed to the public and the gate is locked, but we have special permission to be there on our scheduled observing nights, with the following provisions.:

When you arrive:

a. If the gate is unlocked, that means a member has already arrived. Drive in and pull the gate shut behind you. Do not lock it.

b. If the gate is locked, unlock it and pull it shut behind you but do not lock it. (If you don't know the combination, call ***Dwight*** *at 770-227-9321.)*

When you leave:

a. If you are not the last to leave, close the gate behind you but do not lock it.

b. If you are the last to leave, close the gate behind you and lock the combination lock ***to the other lock*** *(not to the chain).*

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Observing Report: Alan Pryor (4/23/16)

The sky was clear, so I took my 5-in. refractor over to my son's house to show him and his family a few things in the night sky. Gallagher and his wife Liz enjoyed seeing things like **Jupiter** and the globular clusters **M3** and **M53**; 15-month-old **Madeline** must have enjoyed it, too, because she walked around all evening with a huge smile on her face. She is one happy kid!

As always, though, the star of the show was 4-year-old **Natalie**, who has always been interested in astronomy. When she was two, the *Observer* featured a photo of Natalie with a make-believe telescope she made from a toy microphone. *[Editor's Note: Readers can see the photo of Natalie and her stairway-mounted "telescope" on p. 3 of the April, 2014 issue on our web site via the Newsletters link.)*

Natalie helped me unload my equipment cases from the van. I taught her how to use a compass to find north, and she showed everyone else how to hold the compass. She was in charge of telling me when the bubble level was level.

Then I let Natalie operate the telescope, a 5-inch Takahashi GoTo. She used the hand controller to point the 'scope at trees. Doing it in daylight got her familiar with actually looking through a telescope, and she learned to focus it. I had my ladder with big steps, which made it easy for her. She wanted to know why the trees were upside-down.

When it got a little dark, I showed her Jupiter. She even saw the moons. ("How many do you see?" "One-two-three-four!") She had a blast.

Liz says that Natalie tells the teachers at pre-school about my telescope.

("Train up a child in the way (she) should grow, and when (she) is old (she) will not depart from it." [Proverbs 22:16] Good work, Alan! One of these days Natalie will become an astronomer, and when she does you can brag that you were her first astronomy teacher. –Ed.)

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Next Page, Upper Left: NGCs 2237-2239 (commonly referred to as NGC 2237 or **Rosette Nebula**), an emission nebula, and **NGC 2244**, an open cluster at its center. Both of them are in the

constellation *Monoceros*, the Unicorn. Photo by **Felix Luciano**.

Due to its extremely large size – more than four times as large as the **Full Moon** – **Rosette Nebula** is extremely faint visually, and therefore it tends to be overlooked by most observers.

Although the nebula does not appear in any of the A. L. observing programs, the bright open cluster **NGC 2244** is is listed in the Caldwell, Deep Sky Binocular, Herschel 400, Open Cluster and Urban programs. It contains about three dozen stars in an area about $1/2^{o}$ in dia., and it is bright enough to be seen naked-eye as a faint glow on a dark night at JKWMA if you know where to look. 2244 is a young cluster, perhaps less than half a million years old.

The nebula and cluster were discovered in 1784 by **Sir William Herschel**. He designated the three brightest portions of the wreath-shaped nebulosity as NGCs 2237, **2238** and 2239. (A fourth portion was designated **NGC 2246**.)

Dawn Chappell considers Rosette Nebula to be one of the most beautiful in the night sky, so she put it in her **FRAC 50 Observing Program**, along with NGC 2244. Find one of them, and you've found them both.

To observe the Rosette, use a narrowband nebula filter, whether telescopically – or possibly even better – in binoculars. (Place the filter over one of the eyepieces.) In binocs, you're likely to see it as a faint, formless cloud encircling the bright open cluster.

Rosette Nebula and NGC 2244 are about 4,900 light-years away. The nebula is 90 light-years in dia., and the "hole" at the center is about 30 light-years across. The hot young stars of NGC 2244 light the nebula and make it visible to us.

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"Space is big. Really big. You just won't believe how vastly, hugely, mind-bogglingly big it is. I mean, you may think it's a long way down the road to the drugstore, but that's just peanuts to space."

-Douglas Adams
The Hitchhiker's Guide to the Galaxy
(1979)

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Above: NGCs 4298 & 4302, a pair of spiral galaxies in *Coma Berenices*. Photo by **Alan Pryor**. These two lovelies offer a close and startling contrast: edge-on spiral **NGC 4302** and open-armed spiral **NGC 4298**.

In **yr. editor's** Herschel II observing log he wrote: "This close galaxy pair was faint but easy to find, located slightly ESE of **M99**…4302 was slender, elongated 4'x1' and oriented N-S…4298 was oval, and measured about 1-1/2'x1'…(but) those shapes and sizes were not readily apparent at low power (61x), where they appeared almost as one extremely faint, triangular, diffuse mass of uneven brightness. Only at high magnification (161x) did any sort of detail or separation arise. They were maybe 1' to 2' apart at their closest point. I saw no concentration of brightness toward the center of either galaxy." (The dust lane shown in Alan's photo was not visible telescopically.)

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Errata. The 2006 IAU special session that resulted in Pluto's demotion to dwarf planet status was held in Prague, Czech Republic, not in Paris, France as stated.

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