# THE

# FLINT RIVER OBSERVER

**NEWSLETTER OF THE FLINT RIVER ASTRONOMY CLUB**

**An Affiliate of the Astronomical League**

**Vol. 18, No. 9 November, 2014**



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**Club Calendar. Fri.-Sat., Oct. 24-25:** JKWMA observings (at dark, Site #1); **Sat., Nov. 1:** Rock Ranch public observing (7-9 p.m.); **Sat., Nov. 8:** Rock Ranch rainout date (7-9 p.m.); **Thurs., Nov. 13:** FRAC meeting/lunar observing (7-10 p.m., The Garden in Griffin); **Fri.-Sat., Nov. 21-22:** JKWMA observings (at dark, Site #3).

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**President's Message.** I think everyone present thoroughly enjoyed **Phil Sacco's** "Howl-een Fun" talk at our Oct. meeting. If you couldn't make it – well, Phil will be returning for two encore performances in the near future: an indoor talk on mythology, and an outdoor (fireless) version of his popular campfire mythology tour of the night sky. Take my word for it, both talks will be exciting.

We'll also be scheduling other speakers. We always look forward to **Dr. Schmude's** talks, but he's a busy man and we don't want to impose on him too often. We have several other speaker options on the table, and we'll pursue them vigorously.

Finally, I know you'll want to join me in welcoming our newest member, **Ron Yates,** who moved here recently from Louisville, Ky. (A lunar photo that Ron took at our Southern Crescent observing appears on p. 5, and another photo is on p. 6.)

**-Dwight Harness**

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**Last Month's Meeting/Activities.** We had six telescopes and seven people showing **Saturn, Mars,** the **Moon** and a handful of deep-sky objects to about 60 passersby on the campus of Southern Crescent Technical College in Griffin on Oct. 1st. Manning (and womaning) the 'scopes were: **Truman Boyle; Dwight Harness; Erik Erikson; Sara & David O'Keeffe** (who organized the event)**; Bill Warren;** and **Ron Yates,** who later joined FRAC at our October meeting.

On Oct. 8th, **Dwight Harness** and **yr. editor** conducted a planetarium presentation for students and parents at Cowan Road Elementary's STEM Night festivities.

**Phil Sacco's** talk at our Oct. meeting was a "howl-een" success in every sense of the word. Listeners were mesmerized by Phil's wonderfully spooky Halloween-themed presentation, and the crowd in attendance was the largest ever to attend a FRAC meeting that didn't involve dinner with Christmas doorprizes afterward. We had 30 attendees, including 22 members – Phil; **Dwight Harness; Carlos Flores; Tom Moore; Erik Erikson; Steve Bentley; Ron Yates; Alan Pryor; Larry Higgins; Dawn Chappell; Andy Hasluem; Aaron Calhoun; Joe Auriemma; Cynthia**

**Armstrong; Truman Boyle; Dr. Richard Schmude; Steven "Smitty" Smith; Jessie Dasher; Sarah, Cherrie & David O'Keeffe;,** and **yr. editor –** and visitors **Courtney Seabolt; Teresa Watson; Scott Cook; Debbie Dutton;** and **Danny Cox** and three members of his family.

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**This 'n That. Aaron Calhoun's** father-in-law was in the hospital recently, but he's at home and doing fine now.

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**Upcoming Meetings/Activities.** Our October Joe Kurz Wildlife Management Area (JKWMA) observing weekend will be **Fri.-Sat., Oct. 24th-25th.** It will be a good opportunity to chase down some of the Unlucky Thirteen objects that **Phil Sacco** talked about at our October meeting. We'll set up both nights at **Site #1**, the open field – actually, it's a parking area for hunters during the daytime – located on the right side of the driving path, 0.3 mi. from the gate. We'll have cones set out Fri. night, but you can't miss it: it's the first open area on either side of the road after you go through the front gate. Set up on the far right end, i.e., the part that's farthest from the driving path and the front gate.

On **Sat., Nov. 1st**, we'll conduct a public observing at the Rock Ranch, a 1,250-acre cattle ranch and "agri-tainment center" for family fun. The observing will last from 7-9 p.m.. We won't be paid for the observing, but admission will be free for each participating FRAC member and his/her family. Come early and participate in the onsite activities, including: a corn maze; train rides; horse rides; hayrides; a petting zoo; zip lines; pony rides; paddle boats; fishing; a merry-go-round; a pumpkin cannon; and a gift shop and produce stand (open till 6 p.m.) selling products grown onsite.

The Rock Ranch is located 7 mi. W of Barnesville. To get there from, say, Griffin, set your odometer at 0.0 at the junction of 4-lane U. S. 19/41 Bypass and Williamson Rd/ Ga. 362. Go 16.2 mi. south on the 4-lane to Hwy. 36 in Barnesville. (There's a yellow "ROCK RANCH" direction sign at the stoplight where you turn.) Turn right onto Hwy. 36, go 7 mi. and the unpaved entrance to the Rock Ranch parking area will be on your left. (If you go to the paved official entrance, you've gone too far.)

Once you're on the grounds, drive through the parking area to the admissions booth at the far right end to identify yourself. Then, when you go through the fence, turn left and follow that road around the pond and to the right. *(Drive slowly!)*

When you cross the RR tracks, the Handicapped Parking area where we'll park initially is right there at the higher elevation. Later, we'll move a short distance away to our observing site.

The rainout date for the Rock Ranch observing is **Sat., Nov. 8th**, also from 7-9 p.m.

Our club meeting/lunar observing will be from 7-10 p.m. on **Thurs., Nov. 13th** at The Garden in Griffin. Our program will be Part 9, "The Winter Sky," from the *Our Night Sky* dvd.

We'll wind up the month with JKWMA observings on **Fri.-Sat., Nov. 21st-22nd** at **Site #3** (the one that's a mile from the gate). We'll set out cones along the way to guide you in case you've never been there before.

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**The Night Sky in November. Mars** (mag. 1.0) will be up in the SW sky for 3 hrs. after sunset. Since it's about as far away from Earth as it ever gets – about 150 million miles – it will be tiny (but still very orange), with no surface features visible.

Bright **Jupiter** (mag. -2.1) will rise around midnight on Nov. 1st, and around 10 p.m. on Nov. 30th.

The blue disk of **Neptune** (mag. 7.9) will be visible in binocs or a telescope all month; *Astronomy* (Nov. '14) gives excellent finding instructions on pp. 36-37.

Blue-green **Uranus** (mag. 5.7) also will be up all night; finding instructions appear on p. 42 of *Astronomy.*

The **Leonids meteor shower** peaks around 5 a.m. on Mon., Nov. 17th. **Good news:** The **Moon** won't be a factor. (Remember the *Perseids* in August? They were bleached out by a nearly Full Moon.) **Bad news:** The Leonids put on a "meteor storm" performance every 33 years -- but this isn't one of them. (The next one will be in 2032.) **Good news:** The Leonids travel at a very high rate of speed – about 160,000 mph – so they tend to produce more fireballs than most meteor showers. **Bad news:** The peak is likely to produce at best 10-15 meteors per hour, and less at other times. **Good news:** We'll see Leonids on every clear night between Nov. 6th -30th, including our JKWMA

observings on the 21st-22nd. You'll know if they're Leonids meteors if they appear to be coming from the E where *Leo* rises around midnight. The radiant will be near mag. 1.4 **Regulus (Alpha Leo)** and **Jupiter.**

Leonids meteors are remnants of **Comet 55P Tempel-Tuttle,** which returns every 33 years and adds fresh debris to the meteor stream.

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**Prof. Stargazer and "Astronomy History"**

*(Editor's Note: For those of you who have wondered over the years what **Prof. Theophilus** (pronounced: The awfulest) **Stargazer** looks like – well, he's what **Larry Higgins** would look like if Larry looked like Prof. Stargazer. [Or **Alan Pryor,** if Alan looked like Larry or Prof. Stargazer, which he doesn't.])*

*The professor is the world's greatest astronomer and cosmologist – at least, that's what it says on his personal card. But according to the GBI, he is also a world-class pickpocket, con artist, card cheat, swindler and petty thief. He was the only student in his high school graduating class to use a police mug shot for his senior photo.*

*When we visited Prof. Stargazer recently, he was relaxing in a plush velour bathrobe on the balcony of his luxury suite in Reidsville.*

*"Hey, this is pretty nice!," **Joe Auriemma** said, looking around.*

*The kindly old gentleman smiled. "Normally, the Presidential Suite at the state's Club Med Minimum Security Complex is reserved for politicians. But this is an election year, and all of the politicians have sprouted halos. This suite was available, and I won it in a card game with the guards." As he spoke, three aces fell out of his sleeve.*

*Thus our interview began.)*

**Russell Payne**: What did you think of **Bill Warren's** astronomy history Special Edition of the *Observer*?

**Prof. Stargazer:** I thought it was pretty good, considering that he's an ignorant cretin who wouldn't know a lunar crater from a hole in the ground. He probably needed Spell Check to type in his name.

I was disappointed that he overlooked my greatest invention and contribution to astronomy, the *Un-IntelliScope.*

**Ron Yates**: I've never heard of that; what does it do?

**Prof. Stargazer:** It's a computerized GoTo telescope, only without the "GoTo." It doesn't have to be polar aligned, it doesn't move – and best of all, it works equally well under clear or cloudy skies.

**Dawn Chappell**: How does it work?

**Prof. Stargazer:** The "open" end of the Un-IntelliScope isn't open to the sky. In fact, it's not an aperture at all: it's a *screen.* When you punch in an object's name and look through the eyepiece, the computer projects a full-color image of that object onto the screen -- and *Presto!,* you're an instant expert at finding things.

Unfortunately, none of the telescope manufacturers wanted it.

**David O'Keeffe**: Why not?

**Prof. Stargazer:** It's programmable, and when I sent out demo models to Meade, Celestron and Orion, I forgot to erase some photos of an observing I conducted at a nudist colony.

Does anyone have a question about astronomy history?

**Truman Boyle**: I do! Bill said that the ancient Mesopotamians built the first observatories; what were those towers called?

**Prof. Stargazer:** I can't recall. I need a smoke. Anybody got a ziggurat?

**Wayne Gardner**: What is "planting by the signs?"

**Prof. Stargazer:** Years ago, they used to place five-line Burma-Shave poems on signs by the roadside in farm country. You'd read each line as you passed by it. Here's an example:

If things look hazy
Don't give up hope
Buy a bigger
Telescope
Burma-Shave

**Jim Roberts**: What did **Isaac Newton** mean when he said he had stood on the shoulders of giants?

**Prof. Stargazer:** If you're five or six rows deep in the crowd, that's the only way you'll see the parade.

**Tom Moore**: This isn't about history, Professor, but -- What's the dumbest astronomy question you've ever been asked?

**Prof. Stargazer:** During a speaking engagement in Atlanta a couple of weeks ago, I mentioned that it takes sunlight eight minutes to travel from the **Sun** to **Earth**. A fellow in the audience raised his hand and asked, "How long does it take to go the other way, from Earth to the Sun?"

**Tom**: Well, how long does it take?

**Prof. Stargazer,** eyeing Tom suspiciously: When's the last time you were in Atlanta?

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## CIRCLES IN THE SKY

**article by Bill Warren**

All my life's a circle, sunrise and sundown.
The Moon rolls through the nighttime till the daybreak comes around.
All my life's a circle, and I can't tell you why.
The seasons spinning round and round, the years keep rolling by.

-**Harry Chapin**
*Circle*

There are $360^o$ in a circle. The Earth is round, and it circles the **Sun**. The celestial sphere – the sky around us – is a circle that girds the planet in all directions, including the half of the sky that we can't see at any given time. Circles play an important role in astronomy and stargazing.

**Earth's Revolution.** It takes 365 days and 6 hrs. for the Earth to complete one $360^o$ trip around the Sun. Every day of the year, Earth's position in space changes relative to the **Sun**; as a result, we see a slightly different part of the sky every night.

Since there are five more days in a year than degrees in a circle, our view of the night sky shifts by slightly more than one degree every 24 hrs. If you go out tonight and look at **Vega,** and then go out tomorrow night and look at it at the same time, it will have moved $1.01^o$ farther to the west than it was the previous night.

Given unobstructed horizons in all directions, we can see $180^o$ of the celestial sphere. Vega reaches its highest point in the sky during the summer months, so we identify it as part of the "Summer Triangle" with **Deneb** and **Altair**. But since each of the four seasons are three months long, we can also see Vega during the latter half of spring and the first half of fall.

**Earth's Rotation.** The Earth also rotates on its axis. It takes 24 hrs. to complete one rotation.

Due to Earth's rotation, the stars and constellations appear to move across the sky as the evening progresses. Since 24 hrs. = $360^o$, they move from E-W at a rate of $15^o$ per hour. If you look at Vega while it is directly overhead at zenith and then look again an hour later, it will have moved $15^o$ to the west.

So here's my question: *How far is $15^o$ in the night sky?*

**Celestial Measurement.** Some celestial measurements are easy. It's easy to tell how far *$180^o$* is: just face north toward **Polaris, the North Star** and extend your arms straight out to the sides. West is where your left arm is pointing, and east is where your right arm is pointing.

Other, smaller measurements are often necessary in stargazing if you don't use GoTo or PushTo technology to help you find things. For example, let's say that you want to see a comet and *Sky & Telescope* says that on a certain date it will lie $2^o$ (or $3^o$, or $5^o$, etc.) W of a bright star. How do you know how far west of the star to point your telescope to look for the comet on that date?

There are two ways.

a. If you have a Telrad, its three concentric red circles are $1/2^o$, $2^o$ and $4^o$ in dia. If the comet is located $2^o$ W of the star, place the E edge of the outer circle on the star and the comet will be in or near the $1/2^o$ circle. (And if the comet is located $4^o$ W of the bright star, do the same thing and the comet will lie on or near the opposite edge of the outer circle.)

*That's* why Telrads have those illuminated red circles: as an aid in gauging distances up to $4^o$ in the night sky. And that's what makes Telrads superior to the red-dot finders that don't have circles.

b. The other way of measuring degrees of distance in the night sky is less precise yet still generally accurate, especially when gauging

distances larger than $4^o$. It involves using your hands to measure distances. All of the measurements described below start with extending your straight arm toward the sky.

*The width of your little finger held against the night sky is $1^o$, or possibly a bit more. Precision isn't terribly important here, because a 7x35 binocular field of view normally is about $7^o$, and your low-power telescopic fov is $1/2^o$ or more. In either case, that pinky-width will get you close to what you're looking for.

For example, the supernova remnant **M1 (Crab Nebula)** lies $1^o$ NW of the mag. 3 star **Zeta Tauri.** To find the Crab, put the left side of your pinky at Zeta, and M1 will be toward the NW on the other side. *That's* where you'll begin scanning for it.

*$5^o$ = the width of your index finger, middle finger and ring finger held together.

*$10^o$= The width of the back of your fist (not including your thumb).

*$15^o$= The width of your spread index finger and pinky.

*$20^o$= The width of your spread thumb and pinky.

Using the latter measurement, the width of the entire sky from horizon to horizon should be nine thumb-to-pinky widths. Being a "doubting Thomas" at heart, I've tested that measurement many times, estimating where the horizons should be, and I've found it to be remarkably accurate, if not precisely so.

Why wouldn't it be precise? Because some people's hands are larger than others. For example, **Steve Bentley** is bigger than I am, so it's reasonable to assume that his hands are larger than mine. But his arms probably are longer, too, so our extended arms should make the size of our hands roughly equal when held at arm's length against the night sky.

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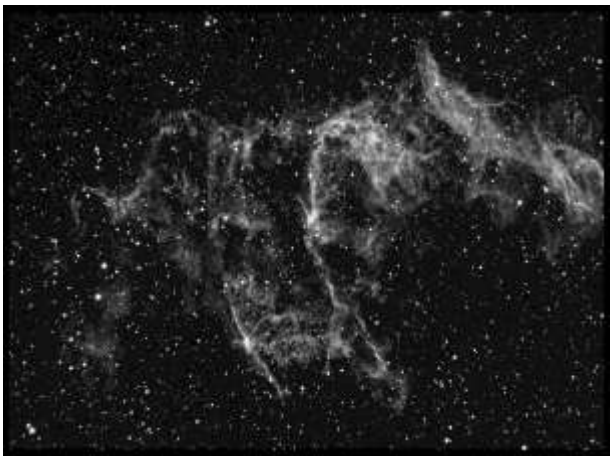
**Upper Right Corner:** Do you see the chubby human figure in **Ron Yates's** photo of the **Moon?** No, it's not **yr. editor** wearing a Speedo. And it's NOT the Man in the Moon: both the Man and the Woman in the Moon are *faces* that can be seen in binoculars during the Full Moon. The Man – seen face-on, but all you can see of him in Ron's photo is his left eye – wears dark glasses. The Woman's face appears in profile, you can see her hair curling down in buns near the terminator.

No, the figure in Ron's photo is **Jack,** of "Jack and Jill" nursery rhyme fame. Jack is wearing a baseball cap on his head (**Mare Serenitatis**), with the bill turned sideways near the top of the photo. His pudgy midsection **(Mare Tranquillitatis**) is below that, and his legs **(Mare Nectaris** on the left and **Mare Fecunditatis** on the right**)** are below. The dark circle near the limb (edge) is **Mare Crisium,** Jack's overturned pail of water. **Tranquillity Base**, where the Apollo 11 lander *Eagle* touched down on July 20, 1969 with **Neil Armstrong** and **Buzz Aldrin** aboard, is located slightly above and to the left of Jack's crotch.



**Above: IC 1340** (a.k.a. **Bat Nebula**), a supernova remnant in *Cygnus*. Photo by **Felix Luciano.**

**IC 1340** comprises a very small portion of the supernova remnant **Veil Nebula**, which in its entirety is 30x as large as the **Full Moon.** The supernova that created the Veil occurred between 5,000-10,000 years ago; since then, the brightest portions have expanded away from each other to

form a pair of parentheses that require binoculars or a wide-field telescope to see them in the same field of view. The Veil is best seen using an O-III or nebula filter.

IC 1340 lies near the S end of the **Eastern Veil (NGC 6995).** It's easy to see in Felix's photo why 1340 is called "Bat Nebula": rectangular "wings" on either side of a "head" that even contains one tiny "eye" in the dark void, and a "tail" section extending to the left of the more prominent foreground wing.

**Above: NGC 7479**, a barred spiral galaxy in *Pegasus.* Photo by **Alan Pryor. NGC 7479** is a classic **S**-shaped spiral galaxy, and one of the most photogenic barred spirals in the night sky. Discovered in 1784 by **Sir William Herschel,** 7479 has been home to two supernova explosions, one in 1990 and the other in 2009.

Visually, 7479 is somewhat less than impressive. In **yr. editor's** Herschel 400 observing notes he described it as "extremely faint under good seeing and transparency conditions. Low surface brightness due to being nearly face-on. Best seen by moving my 134x eyepiece in and out of focus."

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**Above Right: Propeller Nebula (DWB 111)** in *Cygnus.* The **Propeller** is, of course, the **S**-shaped nebulosity at the center of **Felix Luciano's** H-alpha photo. It comprises a very small portion of the massive **Cygnus X** radio source and star-forming complex.

Cygnus X is one of the most active star-forming regions in the **Milky Way**: it contains 10 times as much gas as **Orion Nebula (M42),** and has produced thousands of starbirths in its more than 800 HII regions of ionized hydrogen gas. Cygnus X is located 4,500 light-years from Earth, and spans an area measuring 600 l.y. in diameter.

The Propeller is #111 in the **Dickel-Wendkur-Bieritz** catalog of 193 H-alpha emission nebulas in Cygnus X.

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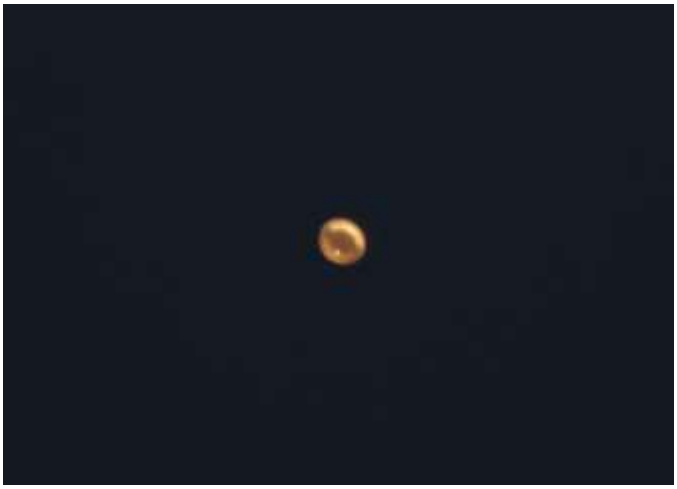

**Above:** From **Ron Yates,** who took the photo: "My girlfriend and I were sitting on our patio around sunset when I looked up toward the northeast and saw what appeared to be a bright star. I didn't think it was, though, so I grabbed her binoculars and took a look.

"It was a silvery blob, but I could not make out any detail. It was obviously at a high altitude since the lower clouds were already turning red from the setting sun. It was also moving very slowly, so I decided to set up my telescope and get a peek at it.

"Sure enough, it was a weather balloon, as I suspected. When I took the photo, I caught the setting sunlight reflecting off of it, giving it a fiery red appearance. Very pretty."

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