THE

FLINT RIVER OBSERVER

NEWSLETTER OF THE FLINT RIVER ASTRONOMY CLUB

An Affiliate of the Astronomical League

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Officers: President/Newsletter Editor, **Bill Warren:** (770)229-6108, warren7804@bellsouth.net; Vice President, **Larry Higgins;** Secretary-Treasurer, **Steve Bentley**.

Board of Directors: **Dwight Harness; Mike Stuart; Jessie Dasher;** and **Laura Harness.**

Facebook Coordinators, **Jessie Dasher** and **Laura Harness;** Alcor, **Carlos Flores;** Webmaster, **Tom Moore;** Observing Coordinator, **Dwight Harness;** NASA Contact, **Felix Luciano.**

Club mailing address: 1212 Everee Inn Rd., Griffin, GA 30224. Web page: www.flintriverastronomy.org.

Please notify **Bill Warren** if you have a change of home address, telephone no. or e-mail address.

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Club Calendar. Sat., Dec. 8: FRAC Christmas dinner party (6:30 p.m., Ryan's Buffet Restaurant in Griffin).

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President's Message. As I told you last summer, I'll be stepping down as FRAC's president in 2013. I'm not going away or dropping out of the club, though; in fact, I'm offering my services next year as vice president. It's a role that I'm very familiar and comfortable with, having served seven years as v.p. in the past. (I'm also staying on as newsletter editor, which is good news if you've enjoyed my work in the past but bad news if you were hoping for a change for the better there too.)

Dwight Harness has volunteered to run for president next year, so naturally I asked Dwight to serve with **Larry Higgins** and me as the nominating committee to prepare a slate of candidates for 2013. It would be unreasonable, to say the least, to expect Dwight to embrace a slate of candidates that he had no say in selecting.

Anyway, here's the rest of the slate of candidates that our committee will nominate for election at the Feb. meeting:

*Larry Higgins will run for a spot on the Board of Directors, along with **Jessie Dasher** and **Mike Stuart.**

*With **Steve Bentley** stepping down from his position as secretary-treasurer in 2013, we'll nominate **Carlos Flores** for Secretary and **Roger Brackett** for Treasurer.

We're biased, of course, but we think that that slate – Dwight Harness, President; Bill Warren, Vice President; Carlos Flores, Secretary; Roger Brackett, Treasurer; and Larry Higgins, Jessie Dasher and Mike Stuart, Board of Directors – is superbly qualified to lead FRAC into the Brave New World of 2013.

On the other hand, just because a nominating committee has selected candidates doesn't mean that no one else in the club is capable of serving admirably in any given elective position. Anyone in FRAC except honorary members can run for any position as a write-in candidate. But election night is not the best time to begin campaigning for office. If you want to run

for office – *any* office – you need to let your fellow club members know your intentions in advance. A brief statement in our January or February newsletter will alert your FRACmates regarding your candidacy and desire to serve.

-Bill Warren

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Last Month's Meeting/Activities. Five FRACsters – **Larry Higgins, Laura & Dwight Harness, Tom Moore** and **yrs. truly --** and about 35 Pre-K students, their parents and teachers attended our observing at Orrs Elementary on Oct. 22nd. We mention it, not just because it's newsworthy and those members inched closer to their next Outreach awards, but also because a textbook example arose regarding how to respond to visitors' questions that you can't answer.

While at yr. editor's telescope, a 4-year-old boy asked, "What's a blue moon?" Our reply was to point to Larry and say, "See that man over there? Ask him."

Five visitors at our Oct. UGa-Griffin lunar observing kept **Larry Higgins, Charles Turner, Aaron Calhoun, Dwight Harness, Chris & Bagitta Smallwood** and **yr. editor** busy all evening. We showed our guests a nearly full **Moon** and its myriad features in every conceivable manner and magnification, and we talked with those who brought telescopes with them about how to set up and operate their GoTo systems.

Twenty members – **Mike Stuart; Dwight Harness; Larry Higgins; Chris & Bagitta Smallwood; Woody, Ben & Brandon Jones; Andy Hasluem; Steven "Smitty" Smith; Felix Luciano; Tom Moore; Aaron Calhoun; Cynthia Armstrong; Steve & Betty Betley; Carlos Flores; Charles Turner; Erik Erikson;** and the evening's speaker, **yr. editor –** attended our Nov. meeting. It was especially good seeing Smitty again after his recent extended stay in the hospital. As the WWE rassler **Ric Flair** used to put it, Smitty is "lookin' good, shtylin' and profilin'" – and that's great, too, considering that Smitty lost 60 lbs. before and during his 40+ days in the hospital.

Our Pike Co. Middle School observing on Nov. 13th was a rip-roaring success in every respect. **Mike Stuart, Joe Auriemma, Laura & Dwight Harness** and **yrs. truly** showed **Andromeda Galaxy, Albireo,** the **Double Cluster** and the **Pleiades** to about 250 of the politest, best-behaved kids we've ever encountered. Laura had the somewhat upsetting experience of having one of the girls at her 'scope address her as "ma'am." Laura's reponse: "Please don't call me ma'am." (Laura is 15 years old.)

We had eleven members – **Andy Hasluem** (Fri. night), **Aaron Calhoun, Charles Turner, Felix Luciano, Alan Pryor, Mike Stuart** and **Erik Erikson** (Sat. night) and **Dwight Harness** and **yr. editor** (both nights) at our Nov. JKWMA observings. Felix invited a friend, **Jose, Rossello,** Sat. evening, and everyone enjoyed the crystal-clear view from Site #3.

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This 'n That. An Open Letter from **Alan Pryor:** "**Dwight** and **Larry** outdid themselves in finding the (JKWMA Site #3). It has excellent horizons and very dark skies. This was the first time in a long time that I've been able to get out and observe with the old gang, and I really enjoyed seeing you guys again. **Felix** and I stayed out till 2 a.m. imaging; it was cold, but the skies were gorgeous. I dressed for cold weather, but next time I'll wear the battery-powered heated vest that my wife gave me last Christmas."

***A. L. Outreach Program News: Carlos Flores** received his Basic Outreach

certificate and pin at our Nov. meeting. Other members due to receive Outreach awards include: **Aaron Calhoun,** Basic Outreach pin; **Charles Turner,** Stellar Outreach certificate; and **Larry Higgins** and **Steve Bentley,** Master Outreach pin.

Eight members – **Bagitta & Chris Smallwood, Cynthia Armstrong, Julie Avery & Sam Harrell, Jessie Dasher, Joe Auriemma** and **Erik Erikson –** need just one more outreach activity to earn their Basic Outreach awards.

*The A. L. is in the process of adding a 46th observing club, the Asterisms Program. We don't know the requirements yet, but we can tell you that there are 110 asterisms on the list – 8 naked eye, 16 binocular and 86 telescopic. Participants will probably need GoTo or PushTo capability – or at least a 'scope with setting circles – because many of the asterisms and their names are unfamiliar.

(If you're new to astronomy, *asterisms* are random alignments of stars that form a recognizable pattern or shape that we associate with something familiar such as a square, a coathanger, a dipper or a teapot.)

We don't know yet if there will be a manual available to tell us how to find the asterisms, but it would certainly be helpful. Presumably they will expect us to draw the asterisms, since giving a written description of an open cluster is as hopeless a task as drawing a picture of a verb such as *take* or *have.*

Yr. editor has seen the Asterism Program list. It contains many of the asterisms he showed and talked about in his Asterisms talk at GSV. The most glaring omissions from the list are the **37 Cluster (NGC 2169)** in *Orion* and the **Little Dipper** in *Ursa Minor.*

There are, however, five Messier open clusters on the list: **M34 (Star Eyed Susan** [?]**); M48 (The Moth** [?]**); M6 (The Butterfly Cluster); M73,** the little 4-star, **Y**-shaped asterism in *Aquarius*; and **M45 (Dipper Bowl** [?]**)** The bracketed question marks refer to nicknames we've never heard associated with those objects.

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Upcoming Meetings/Activities. Experience has taught us that December is NOT a good time to offer a crowded FRAC schedule. There are simply too many other activities going on around the holiday season for us to expect more than minimal attendance, so we don't schedule observings or a meeting per se in December.

Instead, we offer our rollicking, rowdy Christmas dinner party at 6:30 p.m. on **Sat,, Dec. 8th** at Ryan's Buffet Restaurant in Griffin. We hope you're planning to attend this year's festivities, because we always have a large crowd and everyone has a great time eating ourselves senseless, enjoying each other's company, getting to know seldom-seen family members, and grousing about the door prizes that we wanted to win but didn't.

Thanks, incidentally, to everyone who contributed to our door prize fund at meetings in 2012. Your generosity has allowed us to buy a lot of very nice prizes to distribute. **Tim Nix** of The Camera Bug donated three prizes, **Carlos Flores** donated two prizes and **Smitty** donated two. **Stephen Ramsden** will be on hand for a special presentation.

To get to Ryan's from, say, Hampton, come south on U. S. Hwy. 19/41, go past the Hardee's-McDonald's stoplight in Griffin (where you'd turn left to go to a club meeting or right to go to Fayetteville on Ga. Hwy. 92). Go through the next stoplight a block ahead at the Racquethause health spa on the right, and get in the right-hand lane. Before you come to the RR overpass you'll see the red Ryan's neon sign on the right.

Turn right at that road, and Ryan's parking lot is on the left.

FRAC has reserved one of the rooms in the back of the restaurant.

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How (and Why) the Stars Move Across the Sky

by Bill Warren

The celestial sphere surrounds the Earth with stars in all directions. The Earth rotates on its axis from west to east, so stars rise in the east, move across the sky from east to west, and set in the west.

There are 360^o in a circle, and 365-1/4 days in a year. As a result, stars advance one degree farther west across the sky every night. And since one day consists of 24 hours, 360^o divided by 24 hrs. = 15^o per hour. So if you see **Vega (Alpha Lyrae)** in a given location one evening, it will be in roughly the same place the next night at the same time, only one pinky-width farther west. (See below.) It will be moving E-W across the sky at a rate of 15^o an hour.

Those same figures hold true in your binocular and telescopic views, too, although magnification will cause you to see Vega moving across your telescopic field of view (fov). You won't see it moving in your naked-eye view, because there's nothing to indicate movement the way your limited eyepiece fov does. The higher the magnification applied to an object, the faster it will move across your fov.

Try this: when the **Sun** is in the western sky, extend your arm toward it with your index finger and pinky spread apart. That's roughly 15^o. Put your index finger on the Sun with your pinky toward the western horizon or treeline. From that you can determine roughly how long it will be until the Sun goes down at a rate of 15^o per hour. If it's two index finger-to-pinky-widths above the horizon or treeline, it's 30^o high in the sky and will set in about two hours.

Other "rule-of-thumb" measures of degrees: a pinky-width held at arm's length against the sky equals roughly one degree. Your index, middle and ring fingers held together – again, at arm's length against the sky – equals roughly 5^o. Your fist is roughly 10^o wide, and your spread thumb-to-pinky width equals roughly 20^o.

In 1996, the tail of **Comet Hyakutake** stretched a mighty *80^o* – that's *four* thumb-to-pinky-widths across the sky, and nearly halfway from the western to eastern horizon!

Don't worry about the relative size of your fingers and hand: these are rough estimates, and anyway someone with larger or smaller hands than yours probably will have longer or shorter arms.

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Above: NGC 7380, a Herschel 400 open cluster/emission nebula in *Cepheus.* **Yr. editor** didn't see the nebulosity – which is very faint visually -- but he described the cluster in his Herschel 400 notes as being "large and bright at 56x in my 10" Dob. It consists of about 50 stars… and doesn't stand out well against a star-rich background." NGC 7380 is located 2^o -- two pinky-widths -- E of **Delta Cephei. (**North is at the top of **Alan Pryor's** photo**.)**

Understanding Nebulae. Since our astrophotographers take delight in imaging nebulae, here's a brief summary of what nebulae are:

Nebulae are clouds of interstellar gases and/or dust produced by dying stars. Those gases and dust in turn eventually become new stars, or else they dissipate into the vast nothingness of space.

There are basically two kinds of nebulae, **dark** and **bright**. Dark nebulae are discussed briefly in association with **Felix Luciano's** photo of **Barnard 150**.

There are four types of bright nebulae: **emission, reflection, planetary** and **supernova remnants (SNRs)**.

Emission nebulae glow as the result of fluorescence generated by ionized gases within the cloud. **M42 (Orion Nebula)** and **M8 (Lagoon Nebula** in *Sagittarius)* are two examples of emission nebulae.

Reflection nebulae, on the other hand, do not produce their own visible light but rather shine by the reflected light of one or more stars within or near the gas cloud. The **Pleiades (M45** in *Taurus)* is a popular group of reflection nebulae.

Planetary nebulae are thin shells of hydrogen gases cast off from red giant stars prior to their cooling to become white dwarfs. **Sir William Herschel** gave them their name when he noticed their resemblance to the greenish disk of **Uranus. M57 (Ring Nebula** in *Lyra)* and **M27 (Dumbbell Nebula** in *Vulpecula)* are two examples of planetary nebulae.

Supernova remnants (SNRs) are the expanding clouds of debris from supernova explosions. Two well-known SNRs are **M1 (Crab Nebula)** in *Taurus* and **Veil Nebula (NGCs 6960, 6992-5)** in *Cygnus.*

Above: Barnard 150, a dark nebula in *Cepheus.* As seen faintly in **Felix Luciano's** photo, Barnard 150 is a thin, dark shape snaking its way through a Milky Way starfield. At roughly five times the size of the Full Moon, it is far too large to fit into a normal telescopic field of view.

Dark nebulae are clouds of hydrogen gas or dust that neither generate nor reflect light, and thus hide from our view the stars that lie behind them. Usually, we see them vaguely, if at all, and then only as silhouettes overlying bright nebulae or the Milky Way itself.

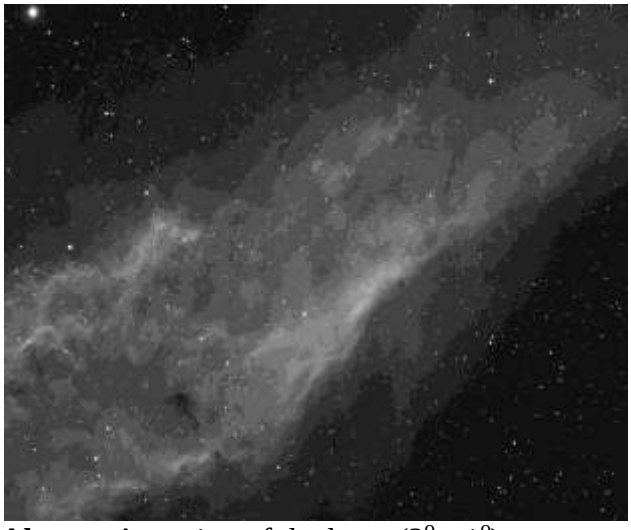
The American astronomer and astrophotographer **Edward Emerson Barnard** catalogued 370 dark nebulae, of which 349 appeared in his 1927 book, *A Photographic Atlas of Selected Regions of the Milky Way.*

Previous Page, Lower Right-Hand Corner: NGC 7727, a small, peculiar Herschel 400 barred spiral galaxy in *Aquarius.* **Yr. editor** saw it at 134x as having "a stellar (starlike) core within a round halo. I didn't see the bar, nor did I see **NGC 7724,** another peculiar galaxy about 12' NW of 7727. A bright orange-yellow star lay about 9' away to the W of 7727." (Photo by **Alan Pryor)**

Above: The Pleiades (M45) in *Taurus.* One of the brightest, best-known and loveliest open clusters in the entire night sky, the **Seven Sisters** – daughters of **Atlas** in Greek mythology – are extremely bright and encompass an area twice as large as the Full Moon. As a result, they are easily visible to the naked eye on a clear winter evening, and splendid in binoculars.

As you can see in **Alan Pryor's** astrophoto, the Pleiades are bathed in nebulosity. The size of the cluster limits our ability to fit the seven stars into a telescopic view except with a rich field telescope or maybe a 32x eyepiece, but you can see the nebulosity with a broadband nebula filter or an O-III filter, especially around **Merope,** the star that forms the inside bottom of the asterism's Dipper-like shape.

Above Right-Hand Corner: The Elephant's Trunk Nebula (IC 1396A) is a star-forming region of ionized gases and dust in *Cepheus.* Its nickname derives from its resemblance to a pachyderm's proboscis. It is part of the larger open cluster/emission nebula **IC 1396,** which spans 3^{o} in dia. and lies immediately S of the lovely bright orange-red **Herschel's Garnet Star (Mu Cephei).**



Above: A portion of the huge (3^{o} x 1^{o}) **California Nebula (NGC 1499)** in *Perseus.* Nicknamed for the its resemblance to the Golden State, the nebula is faintly illuminated by **Xi Persei,** the 4^{th}-mag. star in the upper left-hand corner of **Felix Luciano's** photo. Best seen in binoculars.

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