

THE FLINT RIVER OBSERVER

NEWSLETTER OF THE FLINT RIVER ASTRONOMY CLUB

An Affiliate of the Astronomical League

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

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

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Club Calendar. Fri.-Sat., June 3-4: Cox Field observings (at dark); **Thurs., June 9:** FRAC meeting: 7:30 p.m., Rm. 305 of the Flint Bldg. on the UGa-Griffin campus; **Fri., June 10:** UGa-Griffin lunar public observing (7-10 p.m.); **Sun., June 12:** Sun City Peachtree observing (7:30 p.m.); **Thurs., June 23:** Gordon College observing (9:15 p.m., Abbott's Farm south of Barnesville, Ga.).

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President's Message. During one of our May Cox Field observings, the Coxses' son-in-law stopped by to chat briefly. He told us that **Mrs. Cox** had recently fallen and broken her hip. That unfortunate news reminded us again of something our officers and board members have often discussed, i.e., that Cox Field may not be available to us for much longer. Both of the Coxses are in their 80s now, and their situation and ours could change literally at a moment's notice. We need to be ready when the time comes.

Presently, our best bet for a new observing site is west of Hollonville, about a 10-min. drive beyond Cox Field. The site, which we'll refer to as "Kurtz Rock," is on land owned by new member **Bill Kurtz.** It's a 3-acre slab of granite which, although not as smooth as a paved road, is, in most places, comparable to Cox Field. Using it as an observing site would require painting lines on the rock to steer drivers toward and away from set-up areas in the dark, the same way that we use red-beam flashlights to steer drivers to our observing area at Cox Field.

Bill says that he won't charge us for occasional use of The Rock. It wouldn't work as a star party site due to its primitive nature (think: Cox Field on a hard surface) and lack of the sort of amenities that Camp McIntosh offers. But the dark skies at Kurtz Rock are in fact superior to Cox Field, which has grown steadily more light-polluted in recent years. The horizons aren't quite as good as Cox Field, but it would definitely be a step up in terms of dark-sky observing.

Dwight Harness and I visited the site recently with Bill one evening, and we'll make a return visit with **Larry Higgins** when we can arrange it. We will, of course, let you know promptly if or when any changes are made from Cox Field to Kurtz Rock or elsewhere.

-Bill Warren

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Last Month's Meeting/Activities. Six members – **Dwight Harness, Erik Erikson, Jessie Dasher, Charles Turner, Larry Higgins** and **yrs. truly** –

showed up for our May 6th Cox Field observing. The sky was excellent -- good enough, in fact, for us to find **Copeland's Septet**, a compact group of seven faint galaxies in *Leo*. In a low-power fov, the galaxies are lumped together in an area about as big as your thumbnail. They're easy to find but extremely difficult to observe. Larry saw four of them.

The following evening, five people – three members (**Larry Higgins, Tom Danei** and **yr. editor**) and two neighbors of the Coxses whose names we forgot to write down – had a great time observing under accommodating skies at Cox Field.

We had 16 members, including **Frank Hiller** of Jonesboro (the newest addition to FRAC's fraternity of frolicking fun-lovers) at our May meeting. Other members present included: **Bill Kurtz, Cynthia Armstrong, Smitty, Mike Stuart, Tom Danei, Larry Higgins, Chris & Bagitta Smallwood, Tom Moore, Charles Turner, Jessie Dasher, Carlos Flores, Dwight Harness, yr. editor** and **Dr. Richard Schmude**, our speaker. Known far and wide as a brilliant speaker, Dr. Schmude outdid himself this time with a talk on "Comets" that has to rank right up there with his best-ever presentations. Everyone present learned a lot about comets -- and that's the highest praise that any teacher wants or needs.

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This 'n That. From our "**You Picked a Fine Time to Leave Us, Lucille**" Dept.: While those of us at home were battenning down the hatches and praying to survive the vicious tornadoes that terrorized our area on April 27th, **Jerry & Beverly Williams** were experiencing considerably better weather (and having infinitely more fun) during their vacation-of-a-lifetime trip to the Land Down Under, i.e., Australia and New Zealand. Hopefully, they'll bring tons of photos to share at an upcoming club meeting. And souvenirs for everyone, of course. (Just kidding, Jerry & Bev.)

For **Dwight Harness** and his family, the "land down under" was their driveway, submerged beneath a canopy of downed trees. (As **Larry Higgins** optimistically noted, "Now you have better horizons for observing.") Ditto for **Bill Kurtz**, whose property took a direct hit: he's safe, but he lost his computer

connection and his latest issue of *Astronomy*. As of the May meeting, Kurtz Rock wasn't accessible via the entrance we used in our earlier visit due to felled trees. Bill is seriously considering erecting a storm cellar lest there be a repeat performance of that terrifying evening somewhere down the line.

Apart from those close encounters and a small hole in the roof of Dwight's Dishtec facility on Hwy. 19/41, though, we haven't heard of any significant damage suffered by anyone in FRAC – and no deaths or injuries, thank goodness! The tornado left a ½-mi.-wide path of destruction through Meriwether Co. and northern Pike Co. and Spalding Co. that resembles a war zone.

*In their letter thanking us for having an astronomy booth at Dauset Trail in April, the folks in charge of Bluebirds & Bluegrass Arts & Crafts Festival said the event had 2,669 attendees this year – not bad for a one-day affair! Like **yr. editor's** waistline, that event is getting bigger every year!

*Most people think of astronomers as people who either work in an observatory or teach astronomy courses. All of us in FRAC know better, of course: an astronomer is anyone, whether professional or amateur, who is or has been involved in astronomy.

In the same sense that, if you work regularly in your garden you can regard yourself as a gardener, we are astronomers because we're members of an astronomy club. It doesn't matter how long you've been a member of FRAC, how involved you are in club activities or how much you know about astronomy: belonging to an astronomy club is all the evidence you need to support your claim to being an astronomer. And if you're uneasy about adopting such a lofty title, you can always refer to yourself as an "amateur astronomer."

At any rate, whenever we refer to "astronomers" in these pages, we're talking about you and all other amateurs and professionals who are interested in astronomy, whether as a hobby or a profession.

***Jessie Dasher** was right on the money in his splendid talk at our April meeting: science and religion aren't really so very far apart. They share

common goals such as the quest to understand the universe and mankind's place in it. Practitioners on both sides have switched positions many times in the past, and doubtless they will continue to do so in the future. For example, most religious leaders no longer consider the Earth to be the center of the universe, and most of today's scientists and astronomers agree that the universe had a beginning.

It wasn't always that way, though.

By the 1950s, there were two scientific theories regarding the formation of the universe: the steady state theory and the Big Bang theory.

According to the steady state theory, the universe has always existed, will always exist, and there was no beginning, whether by chance or divine creation. The Big Bang theory holds that the universe arose in a single, massive *Bang!* that occurred about 13.7 billion years ago.

Today, the steady state theory has gone the way of the woolly mammoth, the saber-tooth tiger and **Ken Walburn's** hair. Sixty years of research into the origins and nature of the universe have sent the steady state theory to the trash bin, in favor of the Big Bang theory. (See p. 4.) The question now is not *Was there a beginning?*, but rather *What caused it?* And that's another point where scientists and religious leaders agree: it's a very big question.

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Upcoming Meetings/Activities. We'll kick off June with Cox Field observings on **Fri.-Sat., June 3rd-4th**. (The New Moon is on June 1st.)

Our club meeting will be held at 7:30 p.m. on **Thurs., June 9th**. The business portion of the meeting will be conducted in Rm. 305 of the Flint Bldg. on the UGa-Griffin campus, after which we'll move outside to the front lawn where our speaker, **Steve Knight**, will show and tell us about the "Frankenscope," Steve's 14-in. Dobsonian reflector. The Frankenscope has undergone more cosmetic modifications than **Joan Rivers**. Newcomers especially will enjoy Steve's stirring story of "The Day the Frankenscope Caught Fire" at Chiefland Astronomy Village in Fla.

Our monthly UGa-Griffin lunar public observing will be held on **Fri., June 10th**, from 7-10 p.m. on the same lawn on the UGa-Griffin campus.

At 7:30 p.m. on **Sun., June 12th**, FRAC will conduct an observing for residents of Sun City Peachtree, a Del Webb gated community near Griffin. **Cynthia Armstrong** arranged the event. A good crowd is expected, so we'll need a bunch of FRAC telescopes and their owners.

To get to Sun City Peachtree, go N from Griffin (or S from Hampton) on U.S. Hwy. 19/41, and turn E (right if you're coming from Griffin, or left if you're coming from Hampton) at the stoplight at Birdie Road.

From there, Birdie Rd. becomes Baptist Camp Road. Stay on Baptist Camp Rd. for 2.4 mi. to the 1st and only stoplight. The gated entrance to Sun City Peachtree is just beyond the stoplight, straight ahead: you'll see a huge, lighted waterfall ahead on the right that marks the entrance. Stop at the front gate; the security guard will be expecting you.

Directions from the front gate to the observing site will be announced prior to the observing.

Our clouded-out May Gordon College observing at Abbott's Farm has been rescheduled for 9:15 p.m. on **Thurs., June 23rd**. **Dr. Schmude** always brings a motorcade of 50-60 students, so we'll need a buncha telescopes.

To get to Abbott's Farm from, say, Hampton, come S on U.S. Hwy. 19/41 like you're going to Cox Field, but stay on the 4-lane past the Williamson Rd./Ga. Hwy. 362 exit. Go 19.1 mi. from Williamson Rd. on Hwy. 41 South – it eventually becomes Hwy. 341 – and turn left at paved Brent Road. Turn left into the driveway of the first house on the left.

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TUNING IN TO THE BEGINNING OF TIME

article by **Bill Warren**

In 1964, American radio astronomers **Arno Penzias** and **Robert Wilson** were using a highly sensitive, 20-ft. horn antenna radio telescope to measure faint radio waves bounced off echo balloon satellites. Problem was, after filtering out the effects of radar and radio broadcasting interference, they kept getting other interference in the form of a mysterious

low, steady background noise that didn't go away no matter where they aimed the antenna. They checked their equipment, chased away pigeons that were nesting in the dish, cleaned out the droppings – and the noise remained. But the signals they were picking up didn't come from anywhere on Earth -- or from the **Sun**, the solar system, the **Milky Way** or other galaxies. They were coming from *everywhere*, day and night.

As it turned out, the unidentified noise that Drs. Penzias and Wilson were receiving was what is known today as the **cosmic microwave background (CMB)** – thermal radiation energy left over from the formation of the universe. Since the Big Bang occurred everywhere simultaneously (and in fact created space where there was nothingness before); and since CMB radiation is also found almost uniformly everywhere in the sky; it follows that a causal relationship exists between them.

But here's the really stunning part: ***You can see it, too!*** *You can see these echoes of creation.*

Not in your telescope, though. It doesn't work that way.

Light interacts with matter in different ways and at different wavelengths in the form of gamma rays, X-rays, visible light, infrared rays, radio waves, etc. Cosmic microwave background radiation is found between the infrared and radio wavelengths. It is "cosmic" because the only source of such radiation is the early universe immediately after its formation. It is "background noise" because it is found everywhere and doesn't come from our planet or any nearby objects in space such as stars, nebulae or other galaxies.

The best way to see the CMB is via a radio telescope. You probably have a microwave oven at home, but that's not enough. You also need a dish to collect and focus the radiation and relay it to instruments that detect and record the signals. Your microwave can't do that. It's the price we pay for a good bowl of popcorn.

A few years ago, a group of SETI (Search for Extra Terrestrial Intelligence) researchers at an observatory in Australia were understandably excited when their radio telescope began picking up and recording some new, rhythmic, identifiable signals. Their excitement

was short-lived, however, when they learned that the signals were coming, not from intelligent beings in a faraway galaxy, but from the observatory basement where someone was microwaving his supper.

So where can you see these lingering CMB remnants of the beginning of everything, if not via your microwave?

Your TV set.

If you can tune your TV set between channels, a small portion of the "snow" on the screen will be the noise of the cosmic microwave background. You won't know which parts of the "snow" are CMB photons, of course – but it is nevertheless somewhat humbling to think that a tiny portion of what you'll see dates back to the first minute or so after the universe suddenly banged into existence.

The only other thing in the universe as old as that is **Prof. Stargazer's** jokes.

Oh, and since you didn't ask I'll tell you anyway. Here's how they know that cosmic microwave background radiation dates back to the beginning of time:

It was created in the immense heat of the Big Bang, which was by far the greatest release of thermal energy that the universe has ever experienced. As the universe cooled and expanded after the Big Bang, no energy source in the universe was (or is) capable of generating heat sufficient to produce further CMB radiation. So the only possible explanation for its existence is the Big Bang.

That is in fact one of three "proofs" used to validate the Big Bang theory. The other two are: (a) the redshift spectral emissions of distant receding galaxies and (b) the abundance of hydrogen and other light elements throughout the universe. Taken together, they provide compelling support for the theory that the universe did in fact have a beginning. Rest in peace, steady state theory.

By the way: you can also tune in to meteors and hear them on your digital FM radio. Just tune to a distant known station frequency where all you get is static.

"Meteors burn up in the atmosphere and leave an ionized trail which acts like a mirror to reflect transmitted signals from stations hundreds of miles away," explains **Michael Bischat** of the Royal

Astronomical Society of Canada. Whenever a meteor ionizes the air around it, the station will briefly come in clearly, then fade back into static as the ionized atmosphere dissipates. It doesn't work if there are a lot of FM stations in the area because their overlapping signals will mute the meteor signals.

Listening to meteors is most effective during a meteor shower, of course, because the occurrences are more frequent. And if the sky happens to be cloudy, you won't miss the shower. You'll still hear the meteors' passage even if you can't see them.

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Errata. (Editor's Note: Occasional mistakes are inevitable and perhaps understandable, given the complexity of some of the material that appears in The Observer. But the May issue had more errors than a tee league baseball team, and that is clearly unacceptable! Like the man sez, "Everyone makes mistakes, but you're overdoing it when the eraser is used up before the rest of the pencil.")

*The **Alpha Persei Association** isn't an open cluster. Its stars were born together but spread too widely to be held together by their mutual gravity, as is the case with true star clusters. This moving group is also known as **Melotte 20**, and contains over 100 members, about 1/3 of which are brighter than the rest.

*Something else that **yr. editor** reported on (but forgot to mention as such) in his May binocular report was the **Hyades**, the V-shaped star cluster that forms the face of *Taurus, the Bull*. Spanning 4.6° , the Hyades features seven bright stars forming the "V" and 125 other stars of mag. 9 or brighter within the V.

Also known as **Collinder 50** and **Melotte 25**, the Hyades lie practically within sneezing distance of us, a scant 150 light-years (l.y.) away. Curiously, the cluster's brightest star, mag. 0.7 **Aldebaran (Alpha Tauri)**, the 14th brightest star in the night sky, isn't a true member of the group: it's a foreground object located just 68 l.y. away. 10x50 binoculars show about 40 stars within the V.

*Yr. editor's binoculars are 10x50 Nikons, not Bushnells as stated in the article.

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Below: Tim Cunard photographed **M81 (Bode's Galaxy)**, a spiral galaxy in *Ursa Major*. M81 was, not surprisingly, discovered by **Johann Bode** when he also discovered **M82** in 1774. (North is toward the lower right corner of Tim's photo.)



Above (image by **Felix Luciano**) and **next page, top left** (image by **Alan Pryor**): **NGC 3628**, the largest and faintest of the "Leo Trio" of interacting galaxies that also includes **M65** and **M66**. Located slightly more than $1/2^\circ$ N of **M66**, NGC 3628, an edge-on barred spiral galaxy, is seen in a 10-in. telescope as somewhat cigar-shaped with a thin, E-W oriented dust lane off-set from the galaxy's major axis and visible along the southern edge.



Above (image by **Alan Pryor**): **M13, the Great Cluster** in *Hercules*, is the largest and brightest globular cluster in the northern hemisphere and the third-brightest globular in the sky behind **Omega Centauri** and **47 Tucanae**. M13 was discovered in 1714 by **Edmond Halley**, who first predicted the return of a comet you may have heard of.

Top right: M97 (Owl Nebula), a planetary nebula in *Ursa Major* was discovered in 1781 by **Charles Messier's** assistant, **Pierre Mechain**. Its nickname derives from the two dark areas – the owl's large "eyes," which are shown clearly in **Alan Pryor's** astrophoto. The eyes can also be seen in telescopes 12-in. or larger under dark, transparent skies. According to *Night Sky Observer's Guide, Vol. II* (**George Kepple & Glen Sanner**), "The nebula is brighter with an O-III filter but the eyes seem easier at high power without filters." (p. 400)

Above: Located in southern *Hydra*, **M83** (a.k.a. **Seashell Galaxy**) is one of the finest barred spiral galaxies in the night sky, as you can see in **Alan Pryor's** stunning astrophoto. **Charles Messier** didn't discover this breath-taking treasure of the night sky – it was discovered by **Nicolas Lacaille** in 1752 – but he wisely included it as M83 in his third and final list of Messier objects in 1781.

The NE-SW bar through the galaxy's core curves to the north on top and to the south on bottom in Alan's photo. The entire galaxy has a distinctly nebulous appearance that adds to its beauty.

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