

THE FLINT RIVER OBSERVER

Newsletter of the FLINT RIVER ASTRONOMY
CLUB, an Astronomical League affiliate

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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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Club mailing address: 1212 Everee Inn Road, Griffin, GA 30224. Web page: www.flintriverastronomy.org; discussion group at FRAC@yahoo.com.

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., Dec. 3-4: Cox Field observings (at dark); **Fri., Dec. 10:** FRAC Christmas party (6:30 p.m., Ryan's in Griffin).

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President's Message. Back in mid-October, **Larry Higgins** and I did something that we always look forward to: we went shopping. The place where we shop, **The Camera Bug** on Briarcliff Rd. in NE Atlanta, is by far Atlanta's best source for astronomy stuff. The manager, **Tim Nix**, is fun to talk to, easy to work with, and he always gives us great discounts on everything we buy. And when we're done, we always

go by The Varsity and load up on chili dogs and greasy French fries. ("Whaddayahave, whaddayahave?")

Anyway, we wound up with two terminal cases of gas and an impressive array of door prizes for this year's Christmas party.

Last year, the emphasis was on astronomy books; this year, it's observing tools and equipment. We have, I think, 22 door prizes, most of which were on display at our Nov. meeting. Our three biggest prizes, which sell for \$99.95, \$65.00, \$65.00, respectively, are far more expensive than anything we gave out last year.

There's been a major change in our top prize, and you're gonna like the switch. Instead of the laser collimator, we're substituting an Orion 1.25" Basic Telescope Accessory Kit that includes: an aluminum carrying case with a die-cut foam interior with cut-outs for each accessory; two Sirius Plossl eyepieces (20mm and 7.5mm); a Shorty 2x Barlow lens that doubles the magnification of any 1.25" eyepiece; a neutral-density Moon filter that reduces bright lunar glare and optimizes contrast of craters, highland mountains and lowland mare regions; and best of all, three color filters (#12 yellow, #25 red and #80A blue) to accentuate lunar and planetary features and details. (The bad news: I found out on Nov. 28th that it's on back order and won't be sent until 1/15/11. The good news: somebody's gonna win it on Dec. 10th.)

We're making a couple of changes in this year's party. We're still eating, of course, but this year we'll be back at Ryan's buffet restaurant in Griffin. (More about that on p. 4.)

As for the door prizes...

It's not really fair to give one chip to someone who comes alone and give another guy's family six chips because he brings his wife, his 2-month-old daughter, his brother-in-law, an uncle from Schenectady and a hitchhiker he picked up along the way. So this year we're giving out one chip per individual or family membership. If we have, say, 15 individuals and families present, we'll give out 15 chips, select 15 winners, and then start over. The Grand Prize will be open to everyone.

So yeah, it's theoretically possible that one person will walk away with more prizes than others. But that's the luck of the draw, and not the result of bringing along every family member, in-law and out-law that you're on speaking terms with to increase your chances of winning more than your fair share of door prizes.

I'm being facetious, of course – but it *is* a fair way to do it, if you overlook the fact that I'm adding one more rule, i.e., only the president can win the Grand Prize. (Just kidding.)

Finally, here's a suggestion: if you win a prize that you already have, don't turn it down or grumble about it. Keep it, and after the meeting find someone who won something you don't have and offer to swap prizes with them. Or have **Tom Moore** put it on our website's "Buy, Sell or Swap" link.

At any rate, thanks to everyone who contributed to our door prize fund in 2010. Your generosity has helped to ensure that this year's FRAC Christmas party will be a resounding success.

For the holidays, I think I'll do what comedian **Steve Martin** says he's gonna do: go out to the airport and enjoy a few pat-downs.

Merry Christmas, everyone, and have a happy, healthy and safe New Year!

-Bill Warren

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Last Month's Meeting/Activities. A total of ten hardy FRACsters – **yr. editor** (4 times), **Doug Maxwell** and **Erik Erikson** (twice each) and **Dwight Harness** and **Larry Higgins** (once each) – ventured out to the frozen tundra of Cox Field in early November. The cold weather and (unfulfilled) threat of cloudy skies undoubtedly helped to keep 'scopes packed away at home, but those of us who went had a great time. It never ceases to amaze us how much fun observing is even in hot or cold weather when the sky cooperates.

There were plenty of high points, but the low point came when Doug whisked away a cobweb from inside yr. editor's 'scope.

"On Sat., Nov. 6th," **Smitty** reports, "I held an observing for approximately 15 cub scouts and parents of Pack 48 of Moreland, Ga. It was held at the Coweta County fairgrounds. I showed them **Jupiter** and its moons, **Albireo** and the **Ring Nebula**."

"The weather was clear and freezing. The cub scouts' leader told me that I could end the observing whenever I got too cold. I replied that I was dressed better than they could imagine, and I would stay until they wanted to go. They made it a little over two hours, which I thought was pretty good."

"One youngster would not look in the telescope because he was scared of it. I had brought my 16-in. Dobsonian, and its size intimidated him. His mother tried numerous times to get him to the eyepiece, but he would cry and just would not get near the 'scope."

"I don't know what she or someone else did, but finally, just as we were finishing up, he mustered up the courage to take a peek. "I see stars!," he exclaimed. "Show me more!" So I showed him what everyone else had seen. He spent a very long time looking at Jupiter, but later he said, "Albireo is my favorite." His eyes had been opened to the universe, and I was so happy for him."

We had 20 members at our Nov. meeting: **Steve & Betty Bentley; Brianna Mills; Carlos Flores; Tom Danei; Tom Moore; Dwight & Laura Harness; Jessie Dasher; Cynthia Armstrong; Chris & Bagitta Smallwood; Joseph Auriemma; Doug Maxwell; Felix Luciano; Steven "Smitty" Smith; Charles Turner;** and our speakers, **Erik Erikson, Larry Higgins** and **yr. editor**.

We conducted not one, but *two* public observing on Thurs., Nov. 18th.

First, **Steve & Betty Bentley, Tom Moore, Dwight Harness** and **yr. editor** handed out NASA astronomy materials and showed the sky to well over 100 students and parents at Hubbard Middle School in Forsyth, Ga. A nearly full **Moon** might have made things difficult under other circumstances, but our folks made it look easy.

Then, after packing up and driving to Abott's Farm outside Barnesville, Tom, Dwight and yr. editor joined **Doug Maxwell** and **Charles Turner** for an observing for about 60 Gordon College students from **Dr. Richard Schmude's** classes. This one was

harder because, just as the student motorcade arrived, so did clouds that hid large portions of sky from view. We persevered, though, the way FRAC always does under adverse conditions, and we managed to find enough interesting things to keep the students moving steadily between telescopes.

It just goes to show ya, you never know. We had already written off our Nov. UGa-Griffin lunar observing as an absolute bust and no one would show up. After all, we switched it to Friday, due to the Thurs. public observing, and it's well known that, after a long work week, people want to relax on Fri. evenings. (Or, in this case, maybe drive to Statesboro to watch the Griffin Bears in the state football playoffs.) Add to that a Moon that was two days short of full, and you have a recipe for failure.

So what happens? Eleven FRACsters show up – **Betty & Steve Bentley, Brianna & Erin Mills, Laura & Dwight Harness, Tom Moore, Larry Higgins, Jessie Dasher, Charles Turner** and **yrs. truly** – and we get the biggest crowd of visitors we've had since we started doing the lunar public observing last summer. Three people were considering joining the club, and at least 15-20 other visitors dropped by to see what the nearly full Moon and **Jupiter** were up to.

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This 'n That. In case you're interested in visiting The Camera Bug for some Christmas shopping, here's how to find it. (The store is located in the back of a shopping center at 1799 Briarcliff Rd. NE.)

To get to The Camera Bug from, say, Griffin, go north on U.S. Hwy. 19/41 through Jonesboro to I-75 North. Stay on I-75N to I-20 East. Get off I-20E at Exit 60-B (Moreland Avenue), and stay on Moreland until, when you cross Ponce de Leon Ave., Moreland becomes Briarcliff Rd. Stay on Briarcliff Rd. past the stoplight at N. Decatur Rd., and when you come to the shopping center on your left at the intersection of Briarcliff and Johnson Rd., turn in and go all the way to the far end of the lot, turn right and The Camera Bug will be the last store in the complex.

You can call Tim at 404-873-4513, but going to his website is a waste of time since he's never gotten around to doing more than posting a message saying

that the site will be improved in the near future. He needs to get **Tom Moore** to work on it (for a slight fee, of course.)

If you visit the store, you're bound to buy something since you've never been around so much astronomy equipment in your life, so be sure to tell Tim that you're a member of the Flint River Astronomy Club. And everything you buy, ask him how much of a discount he'll give you.

*If you'd like to keep up with what the **Sun** and its foremost publicity agent, **Stephen Ramsden**, are doing on a regular basis, you can follow both of them by joining Stephen's Google group, <http://groups.google.com/group/solarastronomy.org>.

Says Stephen, "As some of you know, I suffered a pretty serious back injury recently. I am on medication and have seen three doctors. They all said for me to take it easy, but of course that is not in my vocabulary. My friend **Scott Curry** came down to Hopewell Middle School and helped me set up the equipment, and I recruited a few 8th-graders for the tear down.

"I am now setting up two computers, an iMac and a PC under a tent so that the kids can image the Sun themselves through either H-alpha or Calcium K wavelength telescopes. This has really been a big hit with everyone. It also costs a fortune in equipment, but thanks to **B. S.** (an anonymous donor in Suwannee) we have the setup going good and working like a champ. He also just donated a brand new Astrophysics Mach 1 GTO mount so I can add another station to the setup.

"If you would like to hide a few dollars or some quality astronomy equipment – especially a large screen iMac or MacBook Pro -- from Uncle Sam this year on your taxes, please contact me. I am a certified non-profit and can issue tax deductible donation receipts for such goods or cash.

"If you are not in a position to do that, I would appreciate a little prayer to keep the kids interested, my employer friendly and helpful, and my health good enough to continue what has become a really big and successful project.

"Thanks to all my friends for helping make this project the success that it has become. I know that

Charlie (Bates, for whom Stephen's "Charlie Bates Solar Astronomy Project" is named) would be proud.

"-Stephen W. Ramsden, Executive Director, www.solarastronomy.org."

*In an unusual move, the Texas Astronomers Society (TAS) of Dallas, TX has added our "The Night Sky Explorers" program to their website on Vimeo (<http://vimeo.com/channels/tas>). And while we don't mind their doing so – it is, after all, an outreach program designed to publicize our club – it rankled somewhat that they chose to do so without first asking our permission (which we granted belatedly with the understanding that our cd cannot be edited, changed or copied without our permission).

*If, as **yr. editor** has been, you've been impressed with *Astronomy* editor **David Eicher's** magnificent astrodrawings of deep-sky objects that appear in each monthly issue of the magazine, you can find 96 of them in his wonderful book, *The Universe from Your Backyard*. Alas, the book is out of print, but at writing amazon.com had 14 used copies available at \$12.04 + \$3.99 shipping.

Although the subject is open to debate, many deep-sky observers consider drawings to be superior to photographs or ccd images in terms of showing you what you'll actually see at the eyepiece. It's especially true in color photos that are overexposed to show details like the delicate blues and pinks of **Orion Nebula** but bleach out the little 4-star **Trapezium** within it. It's also true of open clusters where photos collect and store light to show many faint stars that you see as a hazy blur in the eyepiece field of view.

*Nine days after Atlanta Astronomy Club ex-president **Keith Burns** disappeared, his body was found by Cobb Co. police during a search of a wilderness area near his home.

Burns, 45 and a Type 1 diabetic who required medication, left home between 9-10 a.m. on Tues., Nov. 9th, to work on a freelance construction job in Hiram, a small town in Paulding Co. He took along his insulin but not his cell phone.

Whether Keith reached the work site is unknown – a witness claimed to have seen his truck there – but the truck eventually was found by the police in Lost Mountain Park, about three miles from his home. A park surveillance camera showed his truck entering the park but gave no indication of who was driving.

Police investigators found no evidence of foul play, and therefore regarded his disappearance as voluntary. Friends and family searched the area on Nov. 12th-13th with no success.

A few days later, with Keith still missing and media coverage of his disappearance escalating, Cobb Co. police announced that they would begin searching the Lost Mountain Park area. They found his body around 10 a.m. on Wed., Nov. 17th.

Art Zorka, an AAC member, probably knew Keith as well as anyone in FRAC. Art writes that "Keith was a friend to everyone who knew him. We are all in shock." At writing, Art was preparing an obituary for the *Reflector* (AAC's newsletter).

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Upcoming Meetings/Activities. Our Cox Field observing weekend will be on **Fri.-Sat., Dec. 3rd-4th**.

Our Christmas dinner party will be held at 6:30 p.m. on **Fri., Dec. 10th** at Ryan's in Griffin. We won't have a formal program that evening, just plenty of eating and fellowship followed by our door prize drawings.

To get to Ryan's from, say, Hampton, come south on U. S. Hwy. 19/41. Go past the Hardee's/McDonald's stoplight at Ga. Hwy. 92 (Fayetteville Rd.), and past the next stoplight (where Racquethouse is on the right, Hong Kong II restaurant on the left) as well. Before you get to the RR overpass, you'll see the red Ryan's sign on the right. Turn right at that road, and the parking lot will be on your immediate left.

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THE TRIVIA QUESTION THAT GREW

Part I of an article by Bill Warren

(Author's Note: This is truly a "tale that grew in the telling.")

*My original purpose was to answer a simple trivia question, i.e., Where in the Solar System can you find objects other than the **Sun**, planets and their moons? But the obvious answer – Everywhere except those places – wasn't what I meant to convey. The only way to approach the subject was to expand the question and start at the beginning.*

Since this is an article – actually, a series of articles beginning in this issue of the Observer – and not a book or series of books, it is necessarily somewhat simplistic. It has also been simplified because, in any aspect of astronomy, incredible complexity lurks just below the surface.

Since we weren't there when the universe or the Solar System was formed, much of astronomy is based on theory rather than fact. Attempting to distinguish between the two can at times be somewhat akin to advancing through a minefield on a pogo stick.

At any rate, my goal isn't to make you an expert on the Solar System or any portion of it, but just to give you a general idea of how it all might have begun in our little corner of the universe. And if I'm lucky and persistent, I may get around to offering you a tentative answer to the trivia question that started it all.)

Where Did the Sun Come From? Once upon a time, the area of space where our Solar System now resides was part of a huge, irregular, rotating cloud of interstellar ice, dust and gases – leftovers from the cataclysmic death by supernova explosion of a red giant star. There was no Sun then, just material that would later become our Sun, planets, etc.

About 5.5 billion years ago, a portion of that immense cloud of dust and gases collapsed under the influence of gravity to form a disk that continued to rotate and compress toward its center. The disk grew as its gravitational influence increased both externally (attracting more material from the cloud) and internally (creating massive amounts of heat and energy from ongoing core compression). The central portion of the rotating disk eventually became the Sun. The outer portion became the planets and everything else in the Solar System. That's why the planets lie more or less in the same plane.

At some point, the gases within the Sun-to-be ignited in the form of nuclear reactions at its compressed core, and a star was born. The nuclear fusion of hydrogen atoms into helium has fueled the Sun for 5.5 billion years, and will continue to do so for another 5.5 billion years.

What About the Planets? Not everything in the Sun's vicinity became part of the newly formed Sun, or else there would be no planets or anything else.

Although the Sun contains 98% of the total mass of the Solar System, there was plenty of leftover material in the outer portion of the nebulous disk, held in place by, and orbiting, the young star. Collisions of superheated particles of matter were frequent in that turbulent outer disk, welding bodies together into clumps. As these clumps – called *planetesimals* – continued to grow through subsequent high-speed collisions that absorbed other bodies or else shattered them like plates dropped on a tile floor – the largest ones extended their dominance to become *planetoids*, or planets-in-the-making. Their volume and mass increased their gravitational attraction to the extent that virtually everything in their paths was either expelled, absorbed, or became moons orbiting them. At that point, they stabilized to become a small but select group of eight planets.

All of the newly formed planets had metallic cores and rocky surfaces composed of heavy elements such as iron, silicon and aluminum. But most of the lighter elements such as hydrogen and helium and mixtures of other gases that were present on **Mercury, Venus, Earth** and **Mars** were pushed away from those planets by the Sun's heat. And most (but not all) of those escaping elements and gases were captured by the outer planets (**Jupiter, Saturn, Uranus** and **Neptune**), transforming them into "gas giants."

Jupiter's core is about the size of the Earth, but its overall volume including gases is 1,430 times that of our planet. Jupiter – and to a lesser extent the other gas giants – exerts a powerful gravitational influence on everything in its vicinity as it orbits the Sun.

The Asteroid Belt. Not all of the planetesimals actually became planets. For example, those that formed near Jupiter found their orbits disturbed by

Jupiter's powerful gravity. The result was frequent violent, high-speed collisions with other planetesimals that shattered them into pieces rather than welding them together. Most of the pieces were either thrown out of the newly formed Solar System or sent hurtling toward Sun, the inner planets or their moons.

(In 2007, a team of U.S.-Czech Republic astronomers identified a large-body impact with the asteroid **298 Baptistina** as the culprit likely responsible for both the rayed lunar crater **Tycho** and the Chicxulub crater in Mexico that killed off the dinosaurs 65 million years ago.)

Some of the planetesimals, however, remained in orbit around the Sun. In time, collisions became less frequent and these planetesimals settled down, cooling into rocky *asteroids* that, under Jupiter's gravitational influence, formed a loose, doughnut-shaped "belt" of objects orbiting the Sun between **Mars** and Jupiter.

Contrary to popular notions, the asteroid belt is mostly empty. There are known to be hundreds of thousands of asteroids, the largest of which is **Ceres** (621 mi. in dia.). More than 200 asteroids are 62 mi. in dia. or larger, and between 700,000-1.7 million of them are as large as 2/3 of a mile in diameter. But numerous spacecrafts have passed through the asteroid belt without incident; you'd be as likely to have a 2-car collision in the middle of the Sahara Desert as a spacecraft collision with a large object in the asteroid belt.

Altogether, the total mass of the asteroid belt is just 4% of our **Moon's** mass. The four largest asteroids – **Ceres**, **4 Vesta**, **2 Pallas** and **10 Hygiea** – account for half of the belt's total mass, with Ceres alone accounting for 1/3 of the total mass. Ceres is the only asteroid large enough to have developed gravitational attraction sufficient to have shaped it into a sphere during its molten stage. The rest are – well, just misshapen rocks.

Definitions: Tiptoeing Through Quicksand. I've used considerable space in this article discussing planets, moons, asteroids and such without defining those terms. Why? Truth is, there are no precise cutoff points that distinguish between a planet, a dwarf planet, a minor planet, a moon and an asteroid.

Anyway, let's belatedly give it a try – defining our terms, that is.

A **star** is a *celestial body that shines through the release of energy and heat produced by nuclear reactions at its core.*

A **planet** might be defined as a *nonstellar object that orbits a star and is large enough to have cleared its area of other, smaller but similar objects through collisions that absorbed those objects or sent them elsewhere.*

By extension, a **moon** could be defined as an *object that is large enough to have achieved a stable orbit around a planet without being drawn into it through gravitational attraction.*

A **dwarf planet** would be a *body that is smaller than the planets but large enough to have established a stable solar orbit that is independent of the influence of the planets.*

The original definition of the term **minor planet** was something like *an object in the Solar System that is smaller than a planet but large enough to have been identified.* But by 2006 the number of minor planets had grown to 480,000 objects, and the International Astronomical Union (IAU) realized that a change was necessary. They pretty much left **asteroids** and **moons** alone, but re-defined minor planets as *dwarf planets* and classified **comets** as *small solar system bodies.*

(Next month in Part II: NEOs, NEAs, PHOs, centaurs, KBOs and OCOs, and why **Pluto** was demoted from planetary to dwarf planetary status.)

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The only thing easy in astronomy is spelling the word.

-Prof. Stargazer

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