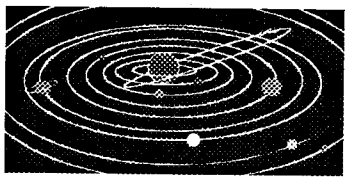
THE FLINT RIVER OBSERVER



Vol. 1, No. 11 **FLINT RIVER ASTRONOMY CLUB** **January, 1998**

Officers: President, Larry Higgins (227-2233); 1st Vice President/newsletter editor, Bill Warren (1212 Everee Inn Rd., Griffin, GA 30224 / 229-6108); 2nd Vice President/Secretary-Treasurer, Ken Walburn (954-9442); AlCor, Melanie Handy (228-6214); Librarian, Keith Cox (227-8171); Hospitality Chairman, Lee Russell (228-0704); Observing Chairman, Steven "Smitty" Smith (583-2200). Club mailing address: 2431 Old Atlanta Road, Griffin, GA 30223. All of these phone numbers have 770 area code prefixes, if it matters.

Please notify **Bill Warren** and **Melanie Handy** promptly if you have a change of address.

* * *

Club Calendar. Thurs., Jan. 8: Club meeting (Beaverbrook media center, 7:00); **Fri., Jan. 9:** "First Light"/ FRAC joint club observing, behind the school at dark; **Fri., Jan. 23:** deep-sky observing (Cox Field at dark).

* * *

President's Message. Let me begin by welcoming our newest club members, **Tom Moore** and his daughter **Katie.** We look forward to seeing the two of you at our upcoming meetings and observings. I think you'll like our group: we don't pretend to be anything more than we are, just people who are fascinated with the night sky and what it holds.

We didn't win the "Best Float" award in the Griffin Christmas Parade held on **Sun., Dec. 7th**, but that doesn't matter. We had a great time and gave the crowd a good show. It was excellent publicity for our club, both live and via two taped parade replays on Griffin's Channel 9.

I'd like to thank the following people for their contributions to our float's success: **Randy Cox (Keith's** brother), who loaned us the flatbed trailer; **Louise Warren,** who prepared the "Flint River Astronomy Club" signs for the float; **Ken Walburn,** who helped plan the decorations and drove his truck to pull the trailer; and everyone who showed up on Saturday to decorate the float and returned on Sunday to ride it.

As **Smitty** announced at the December club meeting, starting with our January meeting one lucky winner every month will take home a door prize via a drawing from among those present. I think Smitty plans to give away a planisphere at the Jan. meeting.

With our Fall Stargaze cancelled by bad weather and various expenditures cutting into our financial reserves, we'll be calling an executive meeting soon to discuss possible fundraisers for the club. Raising our annual dues is our least desirable alternative, although at $10 a year you're getting a lot for your money.

At any rate, we'll keep you posted regarding whatever moneymaker(s) we

come up with, and we hope you'll want to pitch in and help us with it. After all, we're a nonprofit organization, but we aren't in it to lose money. And we don't want to be like the pastor who, in announcing his church's latest drive to raise money, looked out over the congregation and gave his listeners his warmest smile as he began to speak. "And now, dear funds..."

-Larry Higgins

* * *

Notes from the Editor. In case you're an Internet user, I'm now online and looking forward to receiving your articles, hate mail, indecent proposals and/or chatty news about your adventures in stargazing via e-mail. Contact me at:

WE1212LW@aol.com

It was nice hearing from **Tim Astin** that he and his wife **Celia** saw Mercury in binoculars from, of all places, the Ingles parking lot. Elsewhere, **John Wallace** found NGC 253 (the "Sculptor Galaxy") and NGCs 247, 935 and 1052, all galaxies in Cetus. **Larry Higgins** observed Stephan's Quintet -- no, **Ken W.,** it's *not* a jazz ensemble, it's a group of five interacting galaxies in the same field of view near NGC 7331 in Perseus. **Chuck Beckham** got a pretty photo of California Nebula (NGC 1499) in Perseus. And I chased down (among other things) NGC 2169, the "37" open cluster in Orion that was mentioned in the Dec. issue of *Astronomy*, bringing my Herschel 400 total to 55. Aren't you glad you asked?.

So. What have **you** seen lately besides water spots and dust on your primary mirror that you'd like to share with us? We'd like to know.

-Bill Warren

* * *

December Meetings/Activities. Quite a few willing workers showed up for our float decorating get-together on **Sat., Dec. 6th: Larry H., Ken Walburn, Mitch** and **Jordan Hammond, Mike** and **Danielle Stewart, John Wallace, Keith Cox** and, of course, **yr. ubiquitous newsletter editor.** Highlighting the afternoon's activity was **Keith C.** finding Venus in broad daylight, after which of course the rest of us had to find it.

The same motley crew showed up the next day to ride the float in the Christmas Parade on **Sun., Dec. 7th.** I was extremely proud of our float, as you were if you saw it. We had 5 'scopes, a mounted pair of binoculars, and pretty little **Danielle Stewart** accompanied by seven of the handsomest guys since the last time Robert Redford walked through a House of Mirrors maze.

We had 18 in attendance for **Rich Jakiel's** excellent presentation on the history of spiral galaxy observation from Edwin Hubble to Hipparcos and the HST. Some of those old amateur telescopes were truly massive, weighing several tons apiece -- more than **Larry H.** after a spaghetti dinner -- and standing even taller than **Ken Walburn's** Dob (but not as pretty). **Chuck Beckham** showed us his latest astrophoto: it featured a hauntingly beautiful, solitary Jupiter without its moons set against a pitch-black sky. **Suzy Wellons** modeled her beautiful jacket with the Sun, Moon and planets on it. **Keith Cox** brought our fledgling club library collection to the meeting and passed out copies of our holdings list. **Mitch Hammond** wanted to check out Stephen

Hawking's *A Brief History of Time,* but he hasn't finished the *Where's Waldo?* puzzle book he's presently reading. **Keith** also brought along a wonderful mounted collage of Christmas Parade photos he assembled. Nice work, Keith. His camera has more moving parts than a Dallas Cowboys cheerleader, but he handles it like a pro. The camera, that is.

Incidentally, to check out a book just let Keith know what you want and he'll bring it to the next meeting. Then, either bring it back to the following meeting or let Keith know if you need to keep it for another month.

* * *

Upcoming Meetings/Activities. Phil Sacco, vice president and observing chairman of the Atlanta Astronomy Club, will be the featured speaker at our **Thurs., Jan. 8th** club meeting. You already know Phil if you attended our July meeting; he's one of the most enthusiastic speakers you'll ever hear. His interests are eclectic, ranging from the history of the constellations to cosmology, to astrophotography, to practically everything else in the universe. Phil has the rare knack of making his subjects come alive in ways that will entertain and motivate you.

Don't forget **Doug Chesser's** visit in February, either. It may be the best chance you ever get to see what computerized astronomy and CCD-imaging is all about. (Mainly, it's about costing *Big Buck$.)*

We'll hold a joint "First Light" (BB student astronomy club)/FRAC observing at Beaverbrook on **Fri., Jan 9th;** our FRAC deep-sky observing will be on **Fri., Jan 30th** at Cox Field. It'll probably be colder than a tax auditor's heart on that date, but with clear skies the other impediments to good viewing should be absent. If it gets *really* cold, we'll light a bonfire in the back of **Ken Walburn's** truck.

In case you don't know how to get to Cox Field, we're reprinting our map in this issue so you won't have any excuse for not joining us on the 30th. It'll be three days after the new moon, so observing conditions should be just about perfect for you to try out the new sky atlas, star charts or planisphere that you got for Christmas.

* * *

The Sky in January. If you haven't observed the planets lately, you'd better make plans to do so before Jan. 15th, because *that's the day the world will end!* On the evening of the 15th, **Venus, Mars, Jupiter, Uranus, Neptune** and the **Sun** will all lie within the same 30° circle of sky -- and, as everyone knows, the world always ends whenever something unusual like that occurs. Hey, don't laugh: the last time it happened, I lost my wallet!

Mercury will be visible low in the SE up to an hour before sunrise on Jan. 6th. **Venus** will be visible early in the month, far to the lower right of **Jupiter,** which, like **Mars,** will set at 7 p.m. on Jan. 15th. **Saturn** will set four hours later, at 11 p.m., and the **Earth** will vanish from the universe sometime after that. (That's the bad news; the good news is that you won't have to pay off those annoying MasterCard and Visa balances.)

Elsewhere, **Orion** (the Hunter) dominates the sky in January, accompanied by **Taurus** (the Bull) to the NW, **Auriga** (the Charioteer) to the north, **Gemini** (the Twins) to the NE, and **Canis Major** (the Big Dawg) to the SE. There are enough heavenly sights in those constellations to occupy a lifetime of observing; suffice it for us to list a few of the more prominent

treasures: **M42** (the Great Nebula) and **M78**, a reflection nebula in Orion; **M45** (the Pleiades) and **M1** (Crab Nebula) in Taurus; open clusters **M37, M36** and **M38** in Auriga; the wonderful open cluster **M35** and open cluster **NGC 2264** (the "Christmas Tree") in Gemini (see **Art R.'s** Star Hop on p. 7); and, in Canis Major, lovely **Sirius**, brightest star in the sky, open cluster **M41** and **NGC 2362**, an easy-to-find open cluster that I think makes a better "Christmas Tree" than NGC 2264 but isn't prominently displayed until mid- to late-January.

Each of those objects is well worth your finding and observing; *all* of them rate among the most beautiful objects of their kind to be seen in any season of the year. All you need to find them is a simple star atlas or the assistance of one of us who knows where to find them (e.g., **Larry, Smitty, me,** or **John Wallace).**

The Quadrantids meteor shower peaks around noon on Jan. 3rd. Big deal.

* * *

People You Should Know: Ken Walburn. Unlike the other members of the triumvirate that founded FRAC, **Ken Walburn** is quiet, soft-spoken and unobtrusive, almost to the point of shyness. (Actually, I am too, but I hide it by being loud and obnoxious.) Ken has graciously and uncomplainingly allowed me to make him the butt of my jokes in these pages for almost a year now, and for that alone he'll always be special to me. He understands -- as you should -- that the humorous stereotypes in this newsletter (e.g., **Mitch Hammond**, p. 2) bear no resemblance to the people they represent, but were invented by yr. humble editor to keep the **Observer** from reading like a chatty social column telling readers whose cat had kittens in the past month. Frankly, I'd rather read a telephone book.

So here's the real skinny on **Ken Walburn** (maybe I should re-phrase that): he may or may not be hard to get to know initially, depending on how hard you try, but he's a good man and a very good friend to have. (I hope he still considers me a friend after reading all this.) *Loyal* and *trustworthy* are words that leap to mind in describing Ken.

After an epic struggle that lasted about 2-1/2 years longer than the Gulf War, Ken recently finished his homemade 10" Dob; hopefully, he'll unveil it publicly at the **Dec. 26th** Cox Field observing (which, at writing, is still more than a week away). That alone is worth the price of admission to our club. You'll see what I mean. He'd never admit it publicly, but Ken is proud as punch of his new 'scope, and he has every right to be. 'Scopes like that don't grow on trees. They couldn't. The limbs wouldn't support its weight. (Sorry 'bout that, Ken; I wasn't gonna do any more Ken Walburn jokes here, but da debbil made me do it.)

Ken calls himself a "cheese peddler" for Kraft Foods; he lives in McDonough with his wife **Doris**. They have two daughters, **Torrie** and **Cheree'**, and three grandchildren. Besides stargazing, Ken's favorite pastime is babysitting.

* * *

The Early Observations of Barnard's Galaxy

article by Rich Jakiel

Deep-sky observing is full of wonderful surprises. Some objects such as the Great Orion Nebula (M42) or Omega Centauri (NGC 5139) are so beautiful and awe-inspiring that they nearly overwhelm

the senses. Other objects such as Veil Nebula have a much more delicate, subtle beauty. Distant interacting objects and quasars conjure images of power and destruction on an unimaginable scale. Still other objects may be visually unremarkable, yet challenging to the intellect. Such is the case with **Barnard's Galaxy** (NGC 6822), a small, irregular galaxy only 18° south of the galactic plane in the constellation Sagittarius.

A member of the Local Group of galaxies, Barnard's Galaxy is strikingly similar to the Small Magellanic Cloud. Though often overlooked by amateurs, Barnard's Galaxy has a rich observational history and played a key role in determining the scale of the universe. The low surface brightness of the galaxy, combined with its relatively bright H II regions, led to confusion as to its identity during the late 19th and early 20th centuries. A list of early observers of this galaxy reads like a "Who's Who" of early 20th-century astronomers, including such notables as Edward Barnard, Max Wolf, Guillaume Bigourdan, C. D. Perrine and Edwin Hubble. It is this unique combination of great astronomers and object "identity crisis" that fires the imagination regarding Barnard's Galaxy.

Barnard's Early Observations. Edward Emerson Barnard (1857-1923) is unquestionably America's greatest visual astronomer. A tireless observer blessed with exceptional eyesight, he discovered, among other things, sixteen comets, Jupiter's fifth satellite (Amalthea), and numerous nebulae including the California, Rosette, and, of course, Barnard's Galaxy.

Barnard was also an early pioneer of wide-field astrophotography. He took hundreds of wide-field photos of the Milky Way, later incorporating them in his *Atlas of Selected Regions of the Milky Way.* Many of his photos revealed large "starless tracks," as he referred to them -- areas of dark matter obscuring whatever lay beyond them. Using these plates, Barnard would later catalog over 300 dark nebulae.

Though he worked with the giant refractors at both the Lick and Yerkes observatories, many of Barnard's discoveries (including nine comets and 23 deep-sky objects) were made with smaller refractors while he was living in Nashville, Tennessee, from 1883-87 and serving as astronomer for Vanderbilt University. For his research, Barnard used the school's 6" Cooke refractor and his own 5" refractor.

While sweeping for comets with the 5" refractor at low power on the evening of Aug. 17, 1884, Barnard noted the presence of "an excessively faint nebula in the field with and south of the bright planetary nebula no. 4510 of Herschel's General Catalog [i.e., NGC 6818, the Little Gem]." He described the object as being "some 2' in diameter, and...very diffuse and even in its light."

In 1885, Barnard reexamined the object, this time using the 6" Cooke and a "comet [i.e., wide-field] eyepiece" that boosted the galaxy's visibility, leading him to a rather unusual conclusion: "It certainly seems much larger and much denser than last year and I certainly think it has increased in density and size since that time...If it had always been as large and bright as it is now, I cannot conceive how it could have been missed by observers when examining GC 4510. Probably this is a variable nebula."

A Time of Confusion. Though normally a superb observer, Barnard made the rather common mistake of viewing the galaxy on two separate occasions with two different eyepieces and failing to acknowledge that the resulting differences in the galaxy's

appearance were due to the eyepieces.

Although NGC 6822 has a visual magnitude of 9.3, its light is spread over an area of 15.5 x 13.5 arc-minutes. While low-power, high-contrast fields are required for visual confirmation of such objects, the great refractors of the late 19th century had long focal lengths and narrow, restrictive fields and were particularly ill-suited to the task of studying large, low-surface brightness objects such as Barnard's Galaxy.

In 1847 and later in 1864, Sir John Herschel produced the *General Catalogue* of known deep-sky objects. Most of the more than 5,000 entries were made by him and his father William. By the 1880s, however, thousands of new objects had been discovered by Lassell, Swift and others, and a new catalog was needed to fill the gap. The Danish astronomer Johann Dreyer took on the daunting task of sorting, compiling and revising the entries for the *New General Catalogue*, or *NGC* as it is commonly known.

Various observatories across North America and Europe were assigned the task of verifying the entries. In 1887, astronomers using the 26" refractor at the Leander McCormick Observatory in Virginia examined the region around Barnard's Galaxy, but the telescope's high magnifications and restrictive field were inadequate for observing the large, low surface brightness nebula. The galaxy was completely missed, although the two brightest H II regions located along the northern end of the galaxy were noted. The brighter of the two nebulae was presumed to be NGC 6822, while the fainter would eventually receive the designation IC 1308.

Other observers fared no better. Using a 20" refractor, H. A. Holden found only one of the two H II regions and missed the main part of the galaxy altogether, noting that NGC 6822 was "very small" rather than *large* as Barnard had described it.

Across the Atlantic Ocean, the great French visual observer Guillaume Bigourdan applied his 12" refractor to NGC 6822 with absolutely no success: his telescope was too small to detect the H II regions, the field of view too narrow for wide-field observations, and as a result he missed the nebula entirely.

Perhaps on faith of Barnard's legendary observing skills, Johann Dreyer retained his original description of NGC 6822 as "very faint, large, elongate, diffuse." Its status was far from certain, but that was not uncommon during that era.

Meanwhile, numerous observations of other nebulae continued to pour in; soon, observatories all over the world were using the revolutionary new technique, *photography,* to record their discoveries. Thousands of new nebulae were discovered, many of them having a strange, "spiral" form. Dreyer would have to compile two supplemental *Index Catalogues (IC)* just to keep up with the new discoveries. Just what these "spiral nebulae" were was to become the biggest astronomical mystery of the period.

(Part Two will appear in next month's newsletter.)

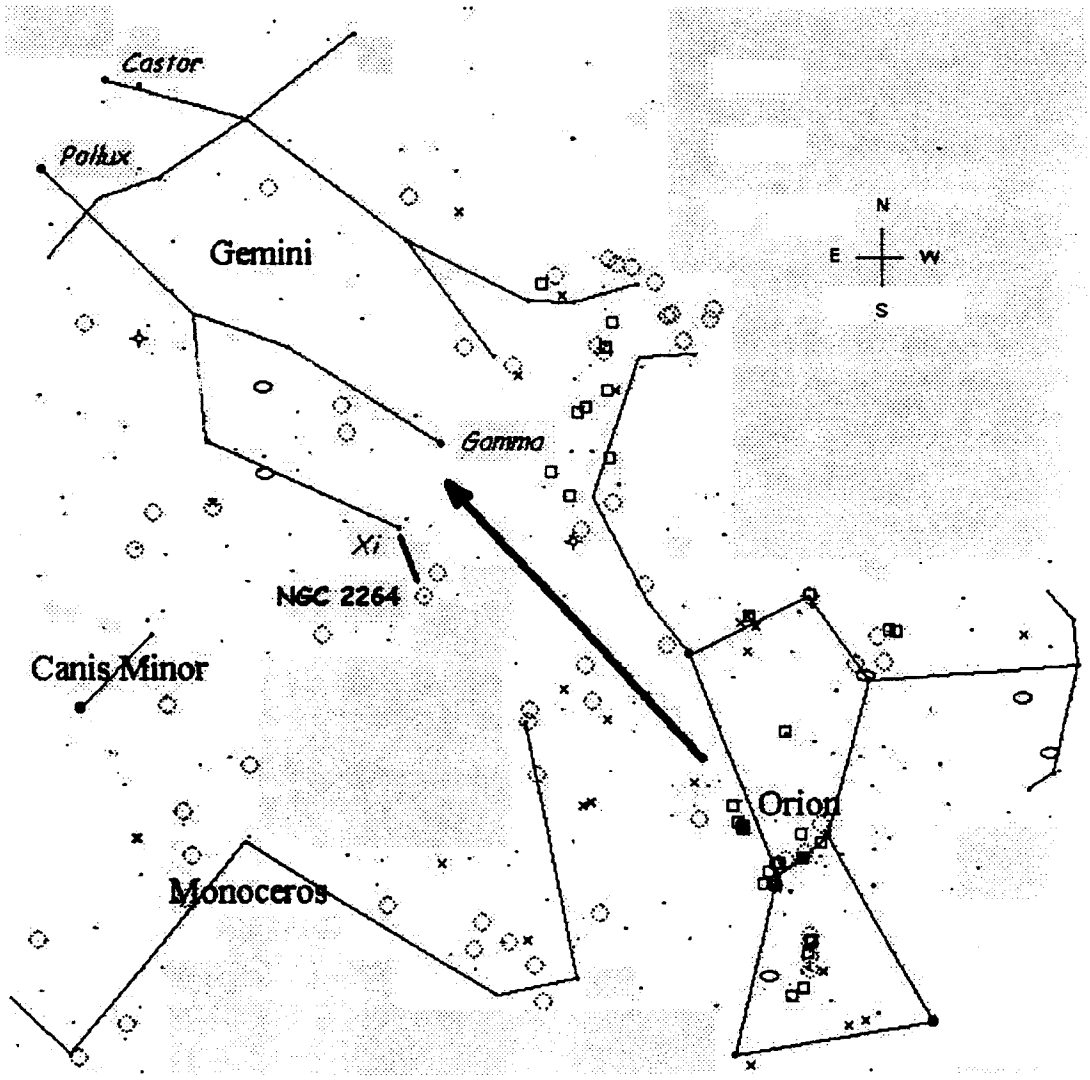
##

Beginners' Star-Hop: December, 1997

By Art Russell

Finally, its that time of year that I most appreciate; cold and clear. Its really the best time of the year for observing as far as I'm concerned. However, let's not forget the season either. Everybody is busy with last minute shopping and their concerns for the holiday season. With that in mind, this month's star-hop will be simple and topical; the "**Christmas Tree Cluster**", NGC 2264.

Although rather small and not visible to the naked eye, the Christmas Tree Cluster is easily located in the extreme north-western corner of the often overlooked constellation Monoceros. Although this constellation is easily overlooked and lacking in significant reference stars, NGC 2264 can be easily located by way of the constellation Gemini which is located immediately to the north.



At this time of year, Gemini is still in the eastern sky and really not visible until later in the evening as it culminates, or passes the meridian directly overhead, at about 2 AM during Decemeber (i.e., you'll have to stay up late to really see this cluster well!). Using the

was using, and some did not allow permissions to access the page. These were most likely due to the security firewall that I must traverse to get to the Internet. Nonetheless, most articles are well written and to the point, and provide information important to understanding astronomy. Best of all, you can learn about astronomy on your own time, without having to spend any more than your Internet Service Provider fee and a little bit of your time.

HOLIDAY SOCIAL

Mark your calendars now!
When: SATURDAY, DECEMBER 13
Where: The Crowleys
3912 Whittington Drive, NE
(see directions below)
Time: 7:00PM
Dress: Festive
Bring your favorite Hor d'oeuvre and beverage. The club will provide soft drinks, mixers, etc.

RSVP: Lynn & Tom Crowley (404) 233-6886 or
Chrissy Mondell (404) 296-6332

DIRECTIONS:

Whittington Drive is off Wieuca Road in North Buckhead. Wieuca runs between Roswell Road and Peachtree Road.

From North of Atlanta:

- Take I-285 to the Roswell Road Exit
- Take Roswell Road South toward Atlanta to Wieuca
- You will pass:
  The Prado on the right just past (1st?) traffic light Glenridge Drive on the left at next traffic light Mt. Paran Road on the right at next traffic light Fountain Oaks Shopping Center on the left just past next light Windsor Parkway on the left at next traffic light West Wieuca at next intersection/traffic light Wieuca Road at next intersection/traffic light
- Take a left on Wieuca Road
- Take a right on Whittington (top of hill on Wieuca, 2nd caution light)

From South of Atlanta:

- Take I-75, I-85, or I-20 to the Downtown Connector North (I75/I85 North)
- Take the Downtown Connector to the I75/I85 split
- Take I-85 North at the split
- Take I-85 to North Druid Hills Road
- Take a left on North Druid Hills Road, cross over I-85
- Cross Buford Highway (1st intersection/traffic light after crossing over I/85)
- Follow North Druid Hills Road to the next light. The road will fork, Roxboro Road on the left, Druid Hills on the right.
- Take the left fork on Roxboro Road.
- Follow Roxboro to Wieuca
- You will pass:
  Goodwin Road intersection at 1st traffic light Large Condo/Apartment complex on right(2nd & 3rd(?) traffic lights) Pass under wooden railroad bridge
  Pass thru 2 more traffic lights
  Road will fork again, stay to the left but in the right lane Circuit City sits in the middle of this fork Next traffic light is Peachtree
  Roxboro becomes Wieuca on the other side of Peachtree Stay in right lane when crossing Peachtree The road will fork again at traffic light/stop sign. Stay to the right to the stop sign.
- Take Wieuca to Whittington
- Take a left on Whittington (past GA 400 overpass, 1st caution light)

A Paradox

by Philip Sacco

Any Zombie in the club knows what is liable to happen when after midnight, someone asks within earshot of me....."Have you ever considered the infinite dimensions of the Cosmos....", or any such thing..... **Fair Game** , and a good number of our new members are hip to the game and the fun that ensues from the mental exercise.....Well, here is one for you to chew on. It is known as **Olbers' Paradox.**

Heinrich Olbers lived in the 1800's, and was what he called a self admitted 'celestial policeman', and avid amateur astronomer who was responsible for discovering two of the first four asteroids ever found along with a number of comets.

Olbers asked a rather silly question: "Why is the sky dark at night?". All right, stop laughing now... His question was poised to question the fact that space was uniformly filled with stars, and infinite. Therefore, he mused, no matter what direction a person would look the would be looking at the surface of a star. Then why isn't the night sky as bright as the Sun?

What do you Think?!.....I'll entertain your answers at the meeting on the 19th, and hope someone will get it correct....Come on Lenny, show your stuff!

Observing Schedule

Dec 6th BEGINNER/PUBLIC OBSERVING SESSION
LOCATION: Villa Rica, Barber Observatory
DESCRIPTION: Join the Atlanta Astronomy Club to get hands on instruction in beginning astronomy and observe the Messier Objects. Please bring your scopes and binoculars. This is a rain or shine event. Bring a stool or folding chair for your comfort. This is a rain or shine event. Weather may preclude the viewing portion of the evening, however any member wanting to get checked out on the equipment and wanting the combos to the facility Must make one of these Orientations. The Beginners Orientations will include a star gaze after the conclusion of the orientation which is scheduled at this time to always begin at 7PM sharp. The timing of the sessions may change with the flow of participation. All Orientations will be at Villa Rica.

Dec13th
Members Social and Party. Welcome all our new members of the year and enjoy a little 'Yule-time Cheer'. Hosted by Lynn and Tom Crowley at their home. Directions in this issue.

Dec 30th
LOCATION: Wyrosdick's Fields, Dahlonega, GA
DESCRIPTION: Join members of the Atlanta Astronomy Club at member Jim Wyrosdick's observing site in north Georgia. Located on a hillock, Jim's site offers 360 degrees of great horizons.

constellation Orion as a quick orientation point, the constellation Gemini is located about 30 degrees, perhaps 1 and a half times the distance spanned by your hand held at arm's length against the night sky, to the northeast of the "belt" of Orion.

Once you've located the constellation Gemini, find the star Xi (ξ) Geminorum, the southeastern most foot of the Gemini twin headed by the star Pollux, Beta (β) Geminorum. From Xi Geminorum, NGC 2264 is located a little more than 3 degrees to the southwest, or about the distance spanned by two fingers held at arm's length against the night sky. Here you'll note a bright star, 15 Geminorum, embedded within the center of a cluster of stars. Using the club's 20 inch (51 cm) telescope at the Barber Observatory, I found the cluster to be very apparent. Additionally, at moderately high power, I found a suggestion of nebulosity around 15 Geminorum. If you have a nebula filter the nebulosity might be more apparent. Take a look. This is a relatively bright cluster and you should be able to find it in even smaller telescopes. Does it look like a Christmas Tree? What do you think?

HAPPY HOLIDAYS
AND
A GREAT NEW
YEAR!!!!

We're here to help! Here's how to reach us:

Address for New Memberships, Renewals, Magazine Subscriptions, and Book Orders:
Atlanta Astronomy Club
3595 Canton Road, Suite A9-305
Marietta, GA 30066

Atlanta Astronomy Club Information Line: 770-621-2661

Internet Home Page: http://stlspb.gtri.gatech.edu/astrotxt/atlastro.html

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The Focal Point

Newsletter of The Atlanta Astronomy Club, Inc.

FROM:
Tushar Thrivikraman
3629 Winbrooke Lane
Tucker, Georgia 30084
kthrivi@emory.edu

FIRST CLASS

The Atlanta Astronomy Club Inc., the South's largest and oldest astronomical society, meets at 8:00 p.m. on the third Friday of each month at Emory University's White Hall or occasionally at other locations (check the hot line for details). Membership is open to all. Annual dues are $25 ($10 for students). Discounted subscriptions to Astronomy, and Sky & Telescope magazines are available. Send dues to: **The Atlanta Astronomy Club, Inc., 3595 Canton Road, Suite A9-305, Marietta, Ga. 30066.**

Hot Line: Timely information on the night sky and astronomy in the Atlanta area is available on a twenty-four hour basis on the Atlanta Astronomy Club hot line: **770-621-2661.**

Check out our ASTRO discussion list on the Internet: ASTRO@Mindspring.com. Also visit our Internet home-page: **http://stlspb.gtri.gatech.edu/astrotxt/atlastro.html**

9805

Dr. William E. & Louise Warren
1212 Everee Inn Rd.
Griffin, GA 30224