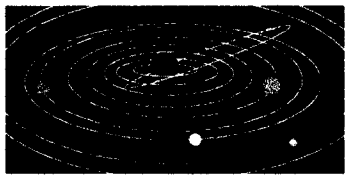
THE FLINT RIVER OBSERVER



Vol. 2, No. 11 **FLINT RIVER ASTRONOMY CLUB** **January, 1999**

Officers: President, Larry Higgins; 1st Vice President/newsletter editor, Bill Warren, 229-6108 -- or, if you prefer e-mail: warren1212@mindspring.com; 2nd Vice President/Secretary-Treasurer, Ken Walburn (P. O. Box 1179, McDonough, GA 30253 / 954-9442; AlCor, Neal Wellons, and Web Site Coordinator, Cody Wellons (946-5039); Librarian, Keith Cox (227-8171); Observing Chairman, Steven "Smitty" Smith (583-2200); Telephone/Hospitality Committee Chairman: Dan Pillatzki (707-0270). Club mailing address: 1212 Everee Inn Road, Griffin, GA 30224. All of these phone numbers have 770 area code prefixes. FRAC web page address: http://welcome.to/frac.

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

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Club Calendar. Thurs., Jan. 7: FRAC meeting (Beaverbrook, 7:30); **Fri., Jan. 8:** Beaverbrook "First Light"/ FRAC joint observing (BB, at dark); **Fri.-Sat., Jan. 15-16:** deep-sky observings (Cox Field, at dark).

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Vice President's Message. For starters, let me welcome newcomer **Mark Mosely** of Warner Robins to our FRAC band of merrie madcaps.

Elsewhere, let me call your attention to the subtle changes taking place in our meeting and observing dates, esp. this month. If you forget to mark down the dates listed in the Club Calendar, you just might show up a week late for our club meeting.

This month's **Art Russell Star Hops** winds up his 2-yr. odyssey of the night sky. Two months are missing -- July '96 and Oct. '97; they will appear in the *Observer* during their appropriate months -- if, that is, I can find them. Meanwhile, we'll continue to run "Star Hops" for the benefit of those who joined FRAC after the series began.

On behalf of everyone in FRAC, I want to thank **Art Russell** for allowing us to feature his "Star Hops" every month; as our new members should know, his series provides directions for finding (among other things) *all* of the Messier objects in their appropriate seasons.

Let me remind you again that you don't have to confine your visits to Cox Field to the dates in the Club Calendar; in fact, with 58 Herschels to go and only a few months left to get them in, I'll probably be out there every clear night between now and June when the Moon isn't a factor in finding faint fuzzies. I'll be happy to have your company.

Finally: I hope all of you had a happy, healthy and inexpensive holiday season, and that 1999 -- the last year before the computers go *kerplunk!* and simultaneously reset to zero at the stroke of midnight on Jan. 1, 2000 -- will be the best year of your life. I know it will be for me, blessed as I am with a loving wife and good friends such as you.

Now, get out there in your backyards and observe one for the Gipper!

-Bill Warren

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Last Month's Meetings/Activities. We had 16 on hand for **Smitty's** timely presentation on cold weather observing tips and techniques at our **Dec. 10th** meeting. (In case you missed it or failed to take notes, his talk, "Of Mukluks And Messiers," appears in written form on pp.

2-4. Take time to read it carefully because, regardless of your observing skills, you won't accomplish much or enjoy being outdoors if you're underdressed for the occasion and your teeth are chattering like a set of wind-up false teeth.

Not coincidentally, **yr. not-so-humble reporter** (for that night, anyway) received his *Binocular Messier Club* and *Lunar Club* pins and certificates. **Dan Pillatzki**, who failed to show up, must not have wanted his Lunar pin so I sent it back. (Just kidding, Dan.)

We also watched a slide presentation by a guest, Tony Bryan, who was representing the Louisville (KY) Astronomical Society and the Astronomical League. Christmas refreshments were served after the meeting.

December began with an observing for Cowan Road Elementary students and parents on **Dec. 1st.** Despite terrible light pollution, the viewing went extremely well, thanks to the presence of **Jupiter, Saturn,** and the "real" stars of the show, the ones who made it all work: **Mike Stuart, Katie & Tom Moore,** and **John Wallace.**

Our Cox Field and BB/FRAC observings were clouded out.

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Membership Renewals Due in December: David Floyd; Phil Sacco & Chrissy.

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January Meetings/Activities. Since the 2nd Thurs. of the month falls on the day before our Cox Field observings this month, we're moving our January FRAC meeting up to **Thurs., January 7th.** Our topic, "Finding Your Way Around the Sky," will be a continuation of the November presentation.

Our BB/FRAC joint observing (see the Nov. issue for instructions on getting behind the school) will be on **Fri., Jan. 8th**.

Our Cox Field deep-sky observings will be held on **Fri.-Sat., Jan 15th-16th**, to take advantage of the proximity of the new Moon.

Although no public or special observings have yet been scheduled, it's likely that we"ll have at least one, and possibly as many as three, in January.

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The Sky in January. Jupiter and **Saturn** will still be up in January -- but beginning the latter 1/3 of the month **Venus** will join them as an evening star low in the western sky. Venus will be 5° E of the Moon on **Jan. 18th.** By the end of the month Venus will be setting 90 minutes afer the Sun.

The **Quadrantids** meteor shower can be seen after midnight on the evening of **Jan. 3rd-4th.** Its radiant (apparent point of origin) will lie a little to the W of the end of the Big Dipper's handle. According to *Sky & Tel,* "The Quadrantids are the only major annual shower whose source object is unknown."

The winter sky contains 7 of the 20 brightest stars: **Sirius** (1st, CMa); **Capella** (6th, Aur); **Rigel** (7th, Ori); **Procyon** (8th, CMi); **Betelgeuse** (10th, Ori); **Aldebaran**(13th, Tau); and **Pollux** (17th, Gem).

The Jan. issue of *Astronomy* suggests a neat way to tell apart the Twins, **Castor** and **Pollux**: Castor is closer to **Capella** (the bright yellow star in Auriga), and Pollux is closer to **Procyon** (the bright white star NE of Sirius).

Stay tuned: *Next month is gonna feature a dyne-o-mite pair of planetary/lunar conjunctions!*

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Of Mukluks and Messiers

article by

Steven "Saratoga Smitty" Smith

Winter skies are a treat for me. The view of the heavens at night is usually crystal-clear and rock-steady. Such conditions seldom occur during the warmer months because moisture in the air degrades the seeing.

Oh, baby, it's cold outside! Have you ever wondered how soldiers in foxholes or sailors at sea cope with frigid temperatures? They stay

warm by trapping air in pockets around them and insulating their bodies from the outside air.

Long underwear, boots, gloves, etc., are made with new materials such as Thinsulate, but even they need some help in keeping us toasty warm. Standing next to your 8" Dob for 2-3 hours at night in the dead of winter can be like standing artillery duty in Korea at Christmas. Astronomers viewing the universe and military personnel standing watch tend not to move around very much. When we're inactive, our bodies do not generate enough warmth to replace the heat that is lost to the outside air; we need to cover our bodies in layers, including head, trunk, hands and feet, in order to minimize our heat loss.

Long underwear is the first layer. Wear the bottom *and* the top, or a one-piece union suit, in either case with an undershirt or tee shirt beneath it. Next, put on a sweatshirt, thermal shirt or sweater. (I prefer a sweatshirt with a hood.) Wear heavy pants such as jeans, and not polyesters. Better yet, wear a pair of bib overalls. You'll feel like a farmer, but the overalls will help to trap the air around your torso.

Now that you're dressed in a fair amount of layers, you may think your favorite winter coat will keep you warm. It may, but there's a better way. The ideal final topping in your winter ensemble is a pair of one-piece, insulated coveralls. I call them walking sleeping bags, and have slept out under the stars in mine numerous times. Made with tough cotton outer shells or lightweight nylon outers, they are known familiarly as coveralls, hunting suits or snowmobile suits. They come in colors ranging from camouflage to day-glo orange. I prefer the more rugged cotton or brown duck outer type because it's more durable.

A good selection of insulated coveralls can be found in the Sears Workwear catalog. You can also find them in K-Mart, Wal-Mart and Army-Navy surplus stores. Every major city has such stores; if you're looking for cold weather gear, a trip to one of them definitely should be on your agenda.

With the major portions of your body covered with at least 3 layers of insulated clothing, you shouldn't expect any admiring glances from the opposite sex because, in all seriousness, you'll look like a waist gunner in a B-17 bomber flying on a mission to Berlin. So now that the major areas are protected let's progress to the extremities, starting at the top.

We lose an enormous amount of heat from our heads. Many people don't like to wear hats, and others say that it's not their head that's cold, it's their hands or feet. While their feeling is correct, their reasoning is faulty. Your metabolism is designed to keep your 2 most important organs, your heart and brain, warm and functional. When you're cold, your circulatory system pumps warm blood to your head to keep your brain working. An uncovered head functions as a radiator, giving up heat to the cold air!

It's somewhat like a game of chess, and your body is a pretty smart player. It's not too concerned about your toes or feet being cold because, like pawns, they are important but expendable. Protecting the brain (i.e., the king) is what wins the match; lose the king and you lose the whole shebang. Even if your head isn't cold, you should wear head protection so the blood-borne warmth that your brain doesn't need will circulate to other parts of your body rather than being lost to the air around you.

When it's chilly, you'll see me wearing a wool knit hat; when it's cold, I'll have the hood of my sweatshirt pulled down over my hat. At frigid temperatures, I wear 2 knit hats. And at the temperature at which French-Canadian fur trappers appear on the observing field I'll put on a balaclava, or knit face mask, under everything else.

Wearing winter gloves while observing creates problems in turning pages of your favorite atlas or manipulating eyepieces, focusers, and especially set screws. When it's really cold, I wear glove liners -- thin gloves that are worn inside the regular gloves and can usually be found in Army-Navy stores or motorcycle shops. I wear these liners under a pair of snowmobile-type mittens. (Leather gloves, while providing warmth, are too stiff to work effectively.) When I have to pull off the mitens to change eyepieces, the glove liners keep my hands away from direct contact with the cold air and my fingers can grasp and

function reasonably well.

The hardest part of the body to keep warm in wintertime is your feet: they're the farthest extremities from your heart, and your footwear is in direct contact with cold ground. Wet feet get cold quickly, so a good pair of insulated leather or rubber boots is important when walking around in dew-laden grass or snow.

Leather insulated boots can be purchased for as little as $30, but they should have insulated toes. Look closely before you buy. Insulated leather boots should be treated with a preservative, or else water will soak through the leather.

Rubber insulated boots are usually made with rubber lowers and cloth or nylon from the ankle up. They usually have a removable insulated liner and are similar in design to Eskimo mukluks. Such boots can be purchased for around $30.

Some excellent boots of both types are to be found in the $90-$150 price range, but unless you're spending a lot of time in the cold a less expensive pair will keep your feet comfortably dry. A cheap pair of insulated work or hunting boots beats a pair of sneakers that absorb moisture, no matter what they cost! Expensive boots of better quality and comfort will probably keep your toes and feet a little warmer. Still, it doesn't matter whether your feet are clad in first class or economy, there are benefits to be gained from layering your clothing here, too.

First, remember that wet feet are cold feet, and apply powder liberally to your feet to help keep them dry. Put on a pair of thin socks, and then a pair of the thickest wool hunting socks you can buy. This is the minimum you should wear to keep your feet warm and dry. Purchase a pair of Dr. Scholl's "Double Air-Pillo" cushioned insoles; they're twice as thick as regular insoles, and they'll add another layer of insulation between your feet and the soles of your boots. If your boots have removable liners, insert the insoles under the liners.

You may have known someone who has tried to cram 6-8 inches of insulation into a 3-1/2" wall space in his home, expecting to insulate it better. Well, it doesn't work that way because insulation is just material that keeps the air from moving and being lost. Trapping air is what keeps our houses and our bodies warm.

With extra layers of clothing and insoles trapping the air around your feet, don't expect your size 10 feet to be comfortable in size 10 boots. The fit will be too tight, and you'll wind up squeezing the warm air right out of your boots. When purchasing insulated boots, buy them at least one full size larger than the size that fits. You may feel like you're wearing Bozo the Clown shoes, but you'll have extra room to wear another pair or two of socks. I have a second pair of boots that is 2 sizes larger than I need, leaving room for me to put a couple of chemical heat packs in the toes!

To recap: The best way to insulate your body from the cold lies in trapping air in layers. Try to dress with thin layers at the skin and gradually build thicker layers outward. My recommendations are flexible, and you can add or change anything you wish, such as more shirts, hooded coveralls, neck warmers, thinsulate socks, etc. But don't depend on anything by itself to keep you warm; build boundary layers. A loose fit is important: you'll want to be able to bend over and move easily, and be able to maneuver in the restroom, too!

Winter has a large number of easy-to-find Messier objects; it is, therefore, a good time for you to start earning your Messier certificate. It's a great time for binocular observing, too. When you see me out at Cox Field this winter, I'll be the farmer on the observing field who looks like he just parachuted out of a B-17 bomber, wearing clown shoes and letting a group of fur trappers look through his telescope.

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Meteorites From Earth:

The Tale of Tektites

article by Richard Jakiel

(Editor's Note: This is the second and

concluding portion of Rich's article. Part One appeared in last month's Observer.)

Finding Tektites. Tektites are found, not in random distributions on the Earth's surface, but in well defined regions known as *strewn fields.* Strewn fields are the material excavated and hurled from the impact crater. Also known as *ejecta,* this material can be thrown hundreds or even thousands of miles and cover areas of millions of square miles. The names of the various types of tektites are derived from the strewn fields of origin.

One can easily visualize the size and shape of unmodified strewn fields by looking at the Moon. The bright streaks radiating outward from the crater **Tycho** are ejecta deposits from the main impact. These bright rays are easily visible even in small telescopes and binoculars; they are most prominent around the time of the full Moon. Other relatively recent lunar craters have bright rays radiating from them. If the impact is at a high angle, the ejecta will be distributed in a circular fashion. Low angle, or grazing, impacts, have a much more elliptical shape. On the Earth, the placement of oceans and erosion/depositing processes have modified the strewn fields into more irregular shapes.

The Main Strewn Fields. Of the seven known strewn fields, the largest is the Australasian Strewn Field. It covers most of Australia and southeast Asia, and a large portion of the Indian Ocean as well. This field is *huge*, estimated to cover almost 20 million square miles! Tektites associated with this field include *Australites, Javanites, Indochinites* and *Philippinites.*

In central Europe, there is the famous Czechoslovakian Strewn Field. Greenish *Moldavites* (named after the Moldau River) come from this field.

Covering most of the southeastern United States is the North American Strewn Field, the second largest strewn field and one of the oldest. It includes the rare *Bediasites* (Texas) and *Georgiatites*, the latter found mostly in the coastal plain of southeastern Georgia.

Other important strewn fields include the Ivory Coast (Africa), Libyan Desert, and Irgiz (central Asia north of the Aral Sea). It is important to note that not all strewn fields have source impact crater(s). For example, no major crater has been linked to the North American field, though the newly discovered structure in lower Chesapeake Bay may change this perception. In contrast, the Australasian field may have several source craters.

Collecting Tektites. Generally, most tektites offer a less expensive alternative to collecting meteorites. Prices quoted from Bagnall in 1989 range from $1-$10/gram, depending on the rarity and condition of the tektite. The common Indochinites are relatively inexpensive, while pretty green Moldavites are more moderately priced. Extremely rare types such as Georgiatites can command much higher prices. Unusual shapes, sculpturing and colors can also affect the market value.

Tektites can also be found in the field, as they are quite distinctive (though small) and often lie on the surface. For example, the Georgiatites are found along the coastal plain in the southeastern third of the state. Because they are much harder than the surface sediments, they are often left as erosional remnants on top of the sandy soil. They may be found simply by walking and looking for an oddly shaped, olive green "rock." But be warned, you should be prepared to do a *lot* of walking. If you are lucky enough to find one, remember that what you've found is an earthly "meteorite."

References.

Bagnall, Philip M. 1991. *The Meteorite & Tektite Collector's Handbook.* Willmann-Bell, Inc., Richmond, Va. 160 pp.

Glass, Billy P. 1982. *Introduction to Planetary Geology.* Cambridge Univ. Press, New York, NY. 469 pp.

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Beginners' Star-Hops; December, 1996

By Art Russell

Here we are, once again gathered under the last cool, clear nights of the year. They say the third time's the charm, so we'll start our star-hops again in the **"Great Square of Pegasus,"** as we have for the last two months. This month's star-hops will find us covering a great bit of the sky so don't get lost as we sweep from Pegasus first to the southeast and the galaxy **M77** in the constellation Cetus. We'll then return to Pegasus to find our way to the cold beauty of the double *Gama Andromeda*, and finally constellation Perseus to the open cluster **M34** and the planetary nebula **M76,** also known as the **"Little Dumbbell"**. This month I'm also going to start telling you how many steps ***[STEP#]*** it ideally takes to find a particular object. Please let me know if you find this addition helpful. Drop me a note, make a phone call, or drop me an email if this helps. Let's get started...and by the way...***Merry Christmas!***

Star-Hop #1; M77, NGC 1068. ***[7 steps].*** This galaxy is perhaps one of the lesser known of the **Messier** objects. I suppose that is because it is located in an area of the sky relatively poor in bright stars and well deep-sky objects. Nevertheless, it is worth the effort to track down this more illusive member of **Messier's** catalogue. Once again, as with any star-hop, get as far away as possible from the lights of any city. After all, our quarry is only found under dark skies. If the sky is reasonably dark, you'll have no problem locating this galaxy; otherwise, and you'll be hard pressed to get even close. ***[1]*** First off, locate the **"Great Square of Pegasus."** ***[2]*** Once there, locate its two southern most stars, *Markab, Alpha (α) Pegasi*, at the "**Square's**" southwest apex, and *Algenib, Gamma (γ) Pegasi*, at the "**Square's**" southeast apex. ***[3]*** Imagine a line extended east from *Alpha Pegasi* and a little south of *Gamma Pegasi*. ***[4]*** Continue the line from *Gamma Pegasi* for about 2 1/2 times the distance between *Alpha* and *Gamma Pegasi*. This is a distance of a little more than 40 degrees, or about twice the distance spanned by your thumb and little finger against the night sky at arm's length. Here you may notice you are located near or within a circlet of stars comprising the northernmost stars of the constellation Cetus. Most prominent in the circlet is the star *Menkar, Alpha (α) Ceti*, that constellation's brightest star. ***[5]*** From there star-hop a little less than 5 degrees or the width of 3 fingers southwest to the star *Gamma (γ) Ceti*. ***[6]*** Then hop about 3 degrees south, or about the width of 2 fingers, to the star *Delta (δ) Ceti*. ***[7]*** From *Delta Ceti*, **M77** is only about a degree to the east-southeast, or about the width of your little finger against the night sky. Moreover, once you've centered *Delta Ceti* in the eyepiece of a telescope, you should be able to pick out the galaxy in the field of view or very nearby. Moderate sized telescopes can find **M77** once you are properly oriented, and will reveal at moderate magnifications a galaxy whose central core is tightly packed in appearance. The galaxy's halo may appear extended beyond its core. However, you probably will not be able to resolve any stars.

Star-Hop#2. ***Gamma (γ) Andromedae.*** ***[5 steps].*** This double star is generally noted as one of the show pieces of the late fall and early winter skies. At high magnification in even a small telescope, the larger of its two stars appears generally yellow-gold. The smaller companion star appears pale, but distinctly blue. This star is at the end of a long chain of dimmer stars, but can be found with patience. ***[1]*** To locate ***Gamma Andromedae***, start once again in the "**Great Square**;" but this time at the northeastern corner and the star *Alpheratz, Alpha (α) Andromedae*. ***[2]*** From there, extend a line to the next star, *Delta (δ) Andromedae*. It may help you to visualize the first two fingers of your hand forming a "V" against the sky: With the apex of your two fingers on Alpha Andromedae and forming a "V" pointing to the north east, you'll find your eastern most finger tip points out *Delta Andromedae*, and your more northernly finger tip points out the star *Pi (π) Andromedae*. ***[3]*** From *Delta Andromedae*, extend a line northeast for a distance about equal to that between *Alpha* and *Delta Andromedae*. Here you'll find the star *Beta (β) Andromedae*. ***[4]*** Once again, extend a line for about the same distance to the northeast to the next bright star, *Upsilon (υ) Andromedae*. ***[5]*** Extend an imaginary line one last time to the northeast for a distance equal to about the width of three fingers and you arrive at ***Gamma Andromeda*** and one of the more spectacular double stars!

Star-Hop#3. M34, NGC 1039. ***[1 step].*** The star-hop to the open cluster **M34** is a natural continuation of the star-hop to *Gamma Andromedae* above. ***[1]*** From *Gamma Andromedae*, extend a line almost directly east for a distance equal to that between *Gamma* and *Upsilon Andromeda*, or about the width of 3 fingers. You'll find **M34** as a moderately bright cluster of stars. In binoculars, **M34** will appear as a moderately large open cluster with 10 stars resolved. Unresolved stars will appear as nebulosity in the cluster. In moderate sized telescopes, the prominent stars in **M34** may appear to form an "X" pattern.

Star-Hop#4. M76, NGC 651, the "Little Dumbbell". ***[6 steps].*** ***[1]*** Return for the last time to the **"Great Square"** and the star *Alpha Andromedae*. ***[2]*** Extend a line northeast to the star *Pi Andromedae*, which we found during our star-hop to *Gamma Andromedae*. ***[3]*** From *Pi Andromedae*, extend an line northeast for about the same distance between *Alpha* and *Pi Andromedae*, and we arrive at the star *Mu (μ) Andromedae*. ***[4]*** Note the apparent distance between *Mu Andromedae* and our starting point, *Alpha Andromedae*, a little less than the distance spanned between your index and little fingers against the sky. ***[5]*** Extend a line from *Mu Andromedae* to the northeast for about this distance and we arrive at the star *Phi (φ) Persei*. ***[6]*** From *Phi Persei*, **M76** is only about a degree, or the width of your little finger, to the north-northwest. At low power, **M76** appears as a distinct smudge. At higher powers, **M76** takes on a distinct dumbbell appearance.