

# The Focal Point

The Atlanta Astronomy Club  
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Editor: Peter Macumber

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## Business Meeting — 21Aug98

The results of the AAC membership mail-in questionnaire were presented. One hundred six (30%) returned the questionnaire with the following responses:

Eighty eight percent of respondents supported the acquisition of a dark sky observing site.

Club initiatives that had support from at least 50% of respondents were the invited speakers program, upgrading of Villa Rica, field trips to astronomical facilities, and purchase of a large portable telescope for the club's use.

Eighty two percent of respondents supported astronomical observing as a program topic for the club.

Topics that received support from at least 50% of respondents were programs on the Hubble space telescope, learning the night sky, planetary missions, astrophotography, galaxies and their evolution, and formation of the universe.

The majority of respondents felt that 60-90 minutes should be the upper limit of driving time to an observing site.

Club activities in which at least 50% of club members participate are dark sky observing, star parties, observing at Villa Rica, and astronomy related classes.

Chrissy Mondell announced the formation of "Ladies of the Night ... Sky" which will be a formal women's auxiliary that will participate in projects associated with the AAC. Any interested females should contact Chrissy.

Minutes from the Deep Sky Site committee meeting were presented. The highlights from this meeting were:

The affirmation that the ACC does need a dark sky site as Villa Rica is becoming increasingly light polluted.

The committee is looking into the possibility of leasing land or having land donated for the AAC's use, as purchasing land would be prohibitively expensive.

Once a site is secured, construction of a warm-up shed with sleeping and restroom facilities would begin followed by an observatory with a roll-off roof for a large Dobsonian and/or Schmit-Cassegrain telescope.

A portion of the Deep Sky funds will be used to purchase a mirror for the large Dobsonian telescope being considered by the club.

There were some concerns raised by the membership on specifics of the Deep Sky Site committee plans some of which were:

The total cost of a large (25 inches) Dobsonian telescope has not been assessed.

Observing from a 5-6 foot ladder.

Rules for use of the large telescope

Issue of using the deep sky funds to offset the cost of the large club telescope.

The Deep Sky Committee is preparing a statement addressing the concerns of the members.

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## LADIES OF THE NIGHT...SKY MEETING

by Chrissy Mondell

Hi Gals,

Things are going great guns now that we have two meetings under our belts. Thanks to all the ladies that attended. It was a lot of fun. The next meeting is scheduled for **September 21**, (another Monday night) starting at around 7:00 or so.. Please come if you can as I think it will turn out to be quite a fun aspect of the club.. Thanks again and I hope to see all the ladies that can attend. We did have a good time... ( But I guess Ladies of the Night...Sky do!!!)hee hee!!!

**We are amateurs, not dilettantes, they cry**

**We track constellations as they slowly pass by.**

**The Moon and Messiers delight,**

**We view Binaries all night.**

**We are "The Ladies of the Night .... Sky"!!!**

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## Focal Point

Not every member can attend every meeting every time. Not every member can come out every month and help with the orientation or be helped at the orientation. **Every member gets a Focal Point.** If you get my point, send your comments to the Focal Point. Stories, anecdotes, articles, comments or questions? Get the Focal Point in *colour*.

Also a special thanks to the people who have submitted articles, etc. If you haven't seen it printed yet, It may show up when you least expect it.

## From the Oval Office

by Philip Sacco

Hello all. First off I would like to give a hearty “Welcome” to all our new members having joined the AAC in the last month! They are: Matt Young, Brian Plikaytis and Cherie Wellborn.

Well, can you believe it? Summer is almost gone and Fall skies are soon upon us!

Please be sure to check out the Lunatix Challenge included in this month's “Focal Point”. It gets more and more interesting as it progresses. Also for those women wanting to take part of a real special gathering.....contact Chrissy Mondell about the ‘Ladies of the Night .... Sky’ group. Chrissy can be reached at: 404-296-6332.

This month shall be remembered in the history of the AAC as a historic time. I will be making a special announcement at Agnes Scott College's September 11th open house. It has come to my attention that Agnes Scott College has formed its own Astronomy Club (the ASCAC). It will be my pleasure to announce our extended hand in friendship to them by formally declaring the ASCAC an ‘Affiliated Member Club of the AAC’. A gala picnic and general social party will be held in welcome to them as we celebrate, quite appropriately, our Walter Barber Memorial Observatory's ‘21st Birthday’. The Party/Picnic will be held the day of Saturday October 24th. It will be at the Observatory in Villa Rica, and that evening we hope to enjoy clear October skies for the October Newcomer and Public Welcome. We will be having a special visual presentation also that night, after the Orientation, as well as a ‘Constellation Walk and Mythology’ discussion for all interested persons.

Plan now to attend as the entire day should prove to be very entertaining right on thru the night.

I have heard rumors that several people have taken up my \$100 challenge for the new bench/tables to be made for the Observatory Annex. ‘Put-Up or Shut-Up’ time for those folk to come forward will be our regular scheduled membership meeting on September 18th.

Several people have voiced an interest in those Piers the Club has for sale, so get ready for the Auction!

Official AAC coffee mugs are on order, so please contact me for yours soon. 404-296-6332.

As I am the only National Member of the Astronomical Leagues “Urban Club”, I entreat you all to contact myself or Keith Burns for details or getting in that club, and join me on the roster. Nothing would please me more than to see My Friends of the AAC fill out the top 10 names on that list. Four of us have recently topped the 100th mark of the Lunar Club, and several more have been submitted to my knowledge. For more information contact any of the Clubs Lunatics: Philip Sacco, Chrissy Mondell, Joanne Cirincione, and ‘Rainman’ himself.....Keith Burns. Wub-ubbaa—Wubbub-baaaa-Wubba!

Lot's of Fun stuff has been going on in the club.....join in the fun! Your contributions make the club what it is!

Hope to see you all at the Zombie Party in October with the folks of FRAC.

## Star Hopping

By Art Russell

It wasn't too long ago that only the largest telescopes, typically in a permanent installation, had setting circles accurate enough to assist in location of deep sky objects. Certainly, many amateur telescopes had analog setting circles, but because of poor design, poor understanding of their use, and an all too often poor polar alignment, they typically contributed to many hours of frustration, instead of serving as an aide to observation. However, within only the last ten years or so, inexpensive digital setting circles and computer-controlled telescopes have become commonly available. Indeed, it's often difficult to find an observing field without some form of computer assisted telescope. However, I'd like to suggest that the art of star-hopping is not dead. Indeed, if anything, its mastery is more important than ever.

## So Why Star-Hopping?

Star-hopping offers the deep sky, and even an outer planets (Uranus, Neptune and Pluto) or comet observer, a convenient method to locate their desired target without computer mediated assistance. More importantly, star-hopping offers the best way to provide the deep sky observer with an understanding and familiarity with the night sky that can only be gained as one spends time under the stars.

Once learned, star-hopping is much like riding a bicycle, you never forget. As such, it remains a valuable tool long after it was mastered. Never quite forgotten, it is quickly recalled by those whose electronic wonder of a digital setting circle or computer-controlled telescope conveniently fails at just the wrong time as they are enroute to a particularly interesting object. Count on it. Murphy's Law was written by an amateur astronomer.

More over, for many objects in a given evening, the experienced star-hopper has often already found and observed many of prominent deep sky objects before a computer mediated scope can be set up and brought to the proper field of view for the evening's first object in that telescope.

## Basic Requirements

Lets be honest. Star-hopping is not for the faint of heart. Like any new skill, it takes time, perseverance and practice. If you aren't a self starter and willing to take the steps necessary to learn how to star-hop, and aren't interested in discovering the secrets of the night sky only available as one takes time under the heavens, star-hopping may not be for you. However, it is certainly not a new subject, having been the subject of numerous articles in any number of astronomy magazines [1, 2, 3].

The first requirement that any star hopper needs is a basic understanding of each seasons' prominent constellations. If you can find the major constellations and their brighter stars, you can use them to find the lesser known constellations [4]. Moreover, its also a pleasure to recognize old friends who've been absent for the season as they first rise from the eastern horizon. It also provides the opportunity to relearn those constellations they've forgotten during their absence and learn a few new ones each season as well. The bottom line is to use the constellations and bright stars that you do know as a stepping off point to find those constellations and stars that you don't know. Most importantly, its by knowing where the constellations and their prominent stars are located, that you can locate any deep sky object.

# Equipment

**Naked eye star-hopping.** One of the first questions often asked by beginning star-hoppers is “What kind of equipment do I need?” Fortunately, the answer is very simple for most people because we are already prepared to be superlative star-hoppers. All you need is your eyes, arms and fingers to do basic star-hopping. Without optical aides, you can find many naked eye deep sky objects under dark skies. Describing locations of objects to others is often problematic. This is because how I see the sky is not exactly how you see the sky unless we have a common reference. However, using the same references of distance, such as the width of a finger, hand, or fist held at arms length (see Table 1), we can describe the location of objects in terms easily understood by all participants. Determining the direction is also easy if we use a common reference in addition to constellations and prominent stars. One of the most common references is to use a “clock” reference for the direction to or from an object (example: it is located 2 finger widths away at the 7 o’clock position from ...). These methods of referencing the night skies are often useful when starting beginners in star-hopping. However, they are of little use when tracking down the many more challenging deep sky objects of interest to the more experienced star-hopper. This type of star-hopping requires the use of view finders, telescopes, and other aides.

|   |            |
|---|------------|
| Distance spanned by the little finger   | 1 degree   |
| Distance spanned by three fingers held together                                     | 5 degrees  |
| Distance spanned by the closed fist   | 10 degrees |
| Distance spanned between the little finger and in pointing finger when spread apart | 15 degrees |
| Distance spanned between the little finger and thumb when spread apart              | 25 degrees |

Table 1: Common Measures of Distance with the hand held at arm’s length [5].

**View finders.** Most telescopes are equipped with some sort of view finder which has been collimated to the main telescope. Where the view finder points, so points the telescope. One form may be a zero-power finder typified by the “Telrad” design which projects an illuminated reticule “bullseye” pattern against the sky. Where ever the bullseye is pointed, the telescope is also pointed, allowing for quick acquisition of bright stars and deep sky objects. The other typical viewfinder is a finder scope. Very simply, a finder scope is a small, low power, wide field telescope used to aim a larger telescope at a remote object. As a general rule, most astronomers find it much easier to point a telescope using some form of aide because telescopes typically have very restricted fields of view, even when using a wide-field eyepiece. Without the use of some form of pointing device, astronomers may spend an entire evening gazing through a very capable instrument, but without ever seeing anything of interest.

Very often, the typical finder scope will be a small 6X30 (6X = 6 power = magnifies 6 times, with a 30mm objective) which most amateurs find to be too small to be of much use. Mind you, this is not to say that the 6X30 finder scope is without its uses. Mine makes an acceptable paper weight. Indeed, experienced deep sky observers will generally mount the largest possible finders on their telescopes, sometimes several, often with

objectives up to and larger than 100mm (4 inches) in order to use fainter stars as an aide to tracking down more difficult deep sky objects [6]. As a general rule, when star-hopping, I’ll often use both a Telrad and finder scope to take advantage of the strengths of both view finders. In this way I can quickly orient on a prominent field star close to the deep sky object of interest with the Telrad, and then switch to the finder scope to help finally zeroing in on my quarry. Stumped as to what size to consider? Nothing less than a 8X50 finder scope should be considered. They are cheap and readily available.

A final word about finder scopes, and by association telescopes and the orientation of their fields of view. You need to take the time to determine both the field of view of your finder scope and that of your telescope’s eyepieces. Knowing the size of your field of view will allow you to know how much of the sky you can see with what ever combination of finder scope, telescope and eyepiece you may choose [7]. In star hopping, one typically starts with a finder scope with its wider field of view, finds the correct location, and then zeros in on the selected object with a lower powered (but typically wider field of view) eyepiece before going to higher powers for observation. A key point to note is the orientation of the field of view in your finder scope and telescope eyepieces. Very often they are different and may lead to difficulty in switching between the finder scope and the telescope. Most telescopes (remember that the finder scope is a small telescope, the Telrad not being a telescope is not a problem here) change the orientation of the image as it is magnified and passed through the eyepiece. Generally, refractors and catadioptric telescopes (Schmidt-Cassegrains) used with standard star diagonals produce mirror reversed images. Newtonian telescopes typically present inverted images. This is an important fact to remember, and when forgotten or poorly understood, has been the cause of much frustration among even experienced observers [8].

**Star Charts.** In amateur astronomy, much like driving a car cross-country, you are only as good as your road maps. The better the map, the better the job you’ll be able to do when you try to locate your destination. Instead of mapping out terrestrial roads, star charts map out the heavens in greater or lesser detail. In a sense, you might also say there is a hierarchy of star charts. At the lower level of resolution, star charts might map out the constellations and bright stars, and often the Messier objects such as found in “Planning A Messier Marathon” [9] or in several of the popular astronomy magazines such as Astronomy or Sky and Telescope [1, 2]. In greater detail, thus offering a greater selection of deep sky objects and stars to 6<sup>th</sup> magnitude as well, is Wil Tirion’s “Bright Star Atlas 2000.0 [10]. Stepping up to Wil Tirion’s Sky Atlas 2000.0, represents a significant jump in detail with 43,000 stars to 8<sup>th</sup> magnitude plotted along with 2,500 non-stellar objects on 26 charts [11]. Sky Atlas 2000.0 is often the first “serious” star atlas an amateur moves into when they decide its time to really start chasing down objects beyond the “big and bright” or Messier objects. However, experienced amateurs often quickly find themselves exceeding the limits of Sky Atlas 2000.0 and needing to go farther. The next step, and arguably the current standard, is Uranometria 2000.0, which in its two volumes, charts some 300,000 odd stars to magnitude 9.5 as well as 10,300 non-stellar objects[12]. Recently, the three volume “Millenium Star Atlas” has been published with more than a million stars to 11<sup>th</sup> magnitude and about the same number of non-stellar objects as Uranometria [13]. However, at \$249 for the set, a price which begins to approach that of a used 486 note-book computer, many advanced amateurs have opted instead to use one of the now popular computer sky atlases.

**Computer Star Charts.** Once the province of only the well heeled or drop dead serious professional astronomer working in UNIX, computer based star atlases have in many ways eclipsed the capabilities of a traditional, paper bound star atlas, in that they can be customized to meet the needs of the user. Need a customized finder chart specifically set up for your tele-

scope and unique selection of eyepieces? Computer based star charts can offer a chart reflecting the “zoomed in” field of view of your favorite eyepiece for those instances wherein you are trying to identify the individual members of galaxy groups and clusters. Popular computer star atlas programs include “Megastar”[14], “The Sky”[15], “Pluto Guide”[16], “Earth Centered Universe”[17], and others.

## Putting it all together: Star-hopping to Pal 13

Buried beneath the “Great Square of Pegasus” is one of a series of globular clusters previously unknown until discovered by chance on photographic plates taken as a part of a National Geographic sponsored sky survey in the 1950’s, the Palomar Sky Survey (POSS) [19]. Dubbed the Palomar (Pal) globular clusters, these 15 globular clusters represent some of the largest (<sup>3</sup> 220 parsec diameter) and most distant (between 93 and 130 kiloparsecs) globular clusters in the galaxy [18, 20]. Taken all together, they represent an observing challenge for even the most accomplished observer.

Pal 13 is conveniently located for star-hopping near Alpha (α) Pegasi, the star marking the southeastern corner of the “Great Square of Pegasus.” However, Pal 13 may prove to be a difficult target. It is very small, only .7 arc minutes in apparent diameter. More importantly, it is relatively dim. With a 13.8 total visual magnitude, its brightest stars are less than 17<sup>th</sup> magnitude [21, 22], suggesting that even under the darkest skies it will be a difficult target and will require high power. It is here that we begin our star hop.

A quick check of Sky Atlas 2000.0 reveals that Pal 13 is not plotted. You’d have to plot its location by hand if you wanted to use Sky Atlas 2000.0. Uranometria 2000.0 is my preferred star atlas when I’m not using Megastar to prepare finder charts. Turning to the back pages of Uranometria, 2000.0, Volume 1, The Northern Hemisphere, presents an azimuthal equal area projection of the constellations superimposed over a grid representing the Uranometria’s 259 charts in Volume 1, where we find that Alpha Pegasi is located on chart 213 (Figure 1). Turning to chart 213, we find that Pal 13 is located below and slightly to the left of Alpha Pegasi (Figure 2). Here, I have superimposed an approximate 1 degree field of view, which when centered on Alpha Pegasi, just touches the star SAO 108393. By sweeping 2 more fields of view to the south, Pal 13 will appear in the field of view. Be sure to check the field stars (Figure 3), as a small galaxy, NGC 7479 is located about 1/2 degree to the southwest of Pal 13. However, at 4 X 1 arc minutes in size, it should be easily distinguishable. Additionally, an even smaller galaxy, NGC 7495, is located a little less than a degree to the southeast. Be careful in this case. NGC 7495 is about the same size as Pal 13 and about the same magnitude, so check your field stars to confirm your observation.

Well, there you have it. The nuts and bolts of star-hopping. These same basic techniques can be used to find the “big and bright,” or the “dim fuzzies.” Most importantly, unlike electronic aides, star-hopping, once mastered, will never fail.

| Object | RA       | Dec      | Dia (') | Mag  | Star Chart      |
|--------|----------|----------|---------|------|-----------------|
| Pal 13 | 23 06 44 | +12 46.3 | 0.7     | 13.8 | Uranometria 213 |

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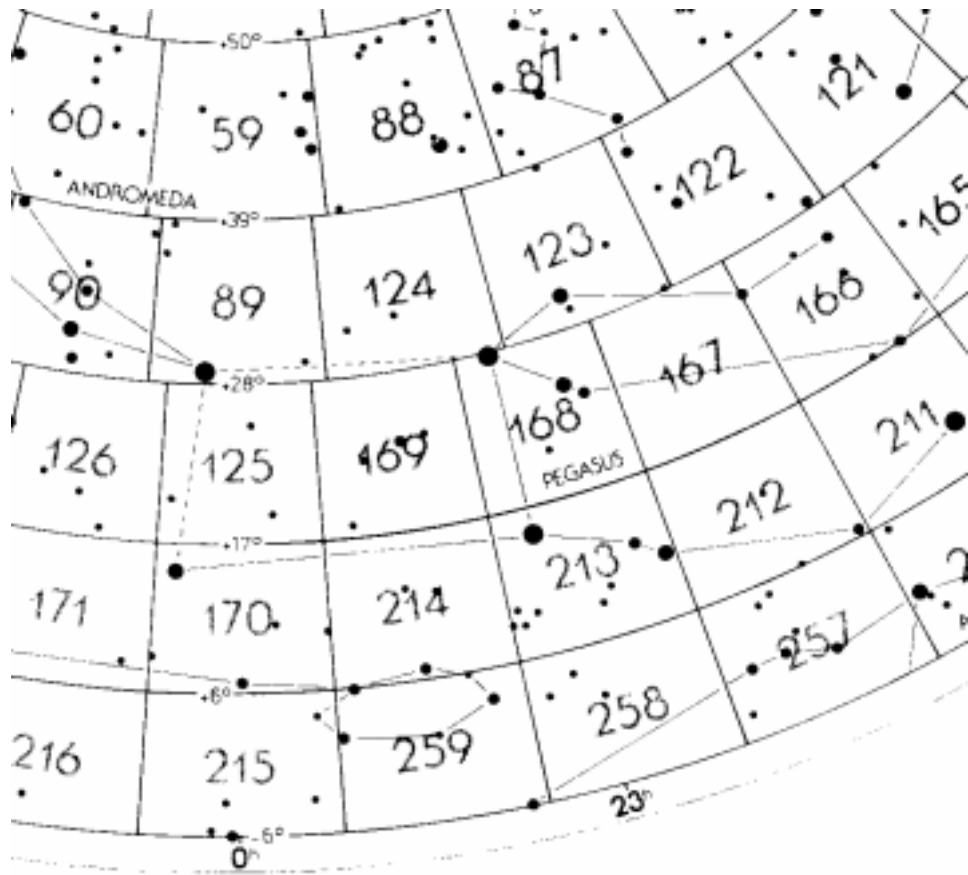


Figure 1. Uranometria guide to charts.

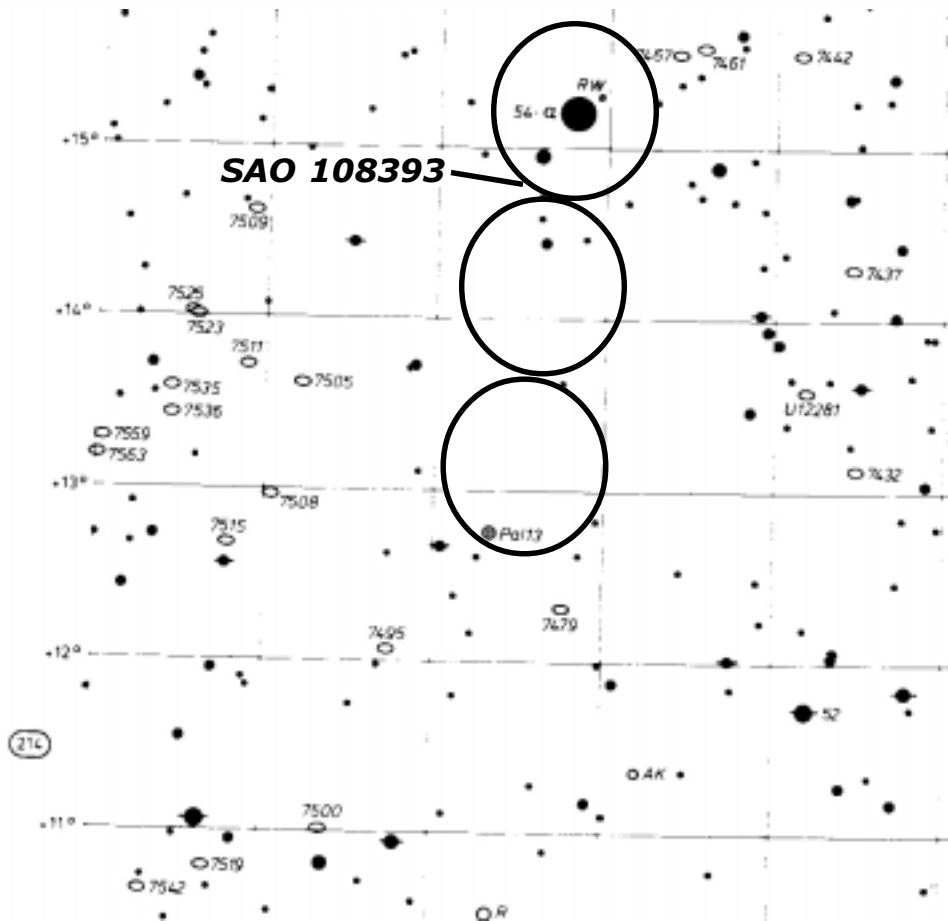


Figure 2. Uranometria Chart 213 abstract with superimposed 1 degree fields of view.

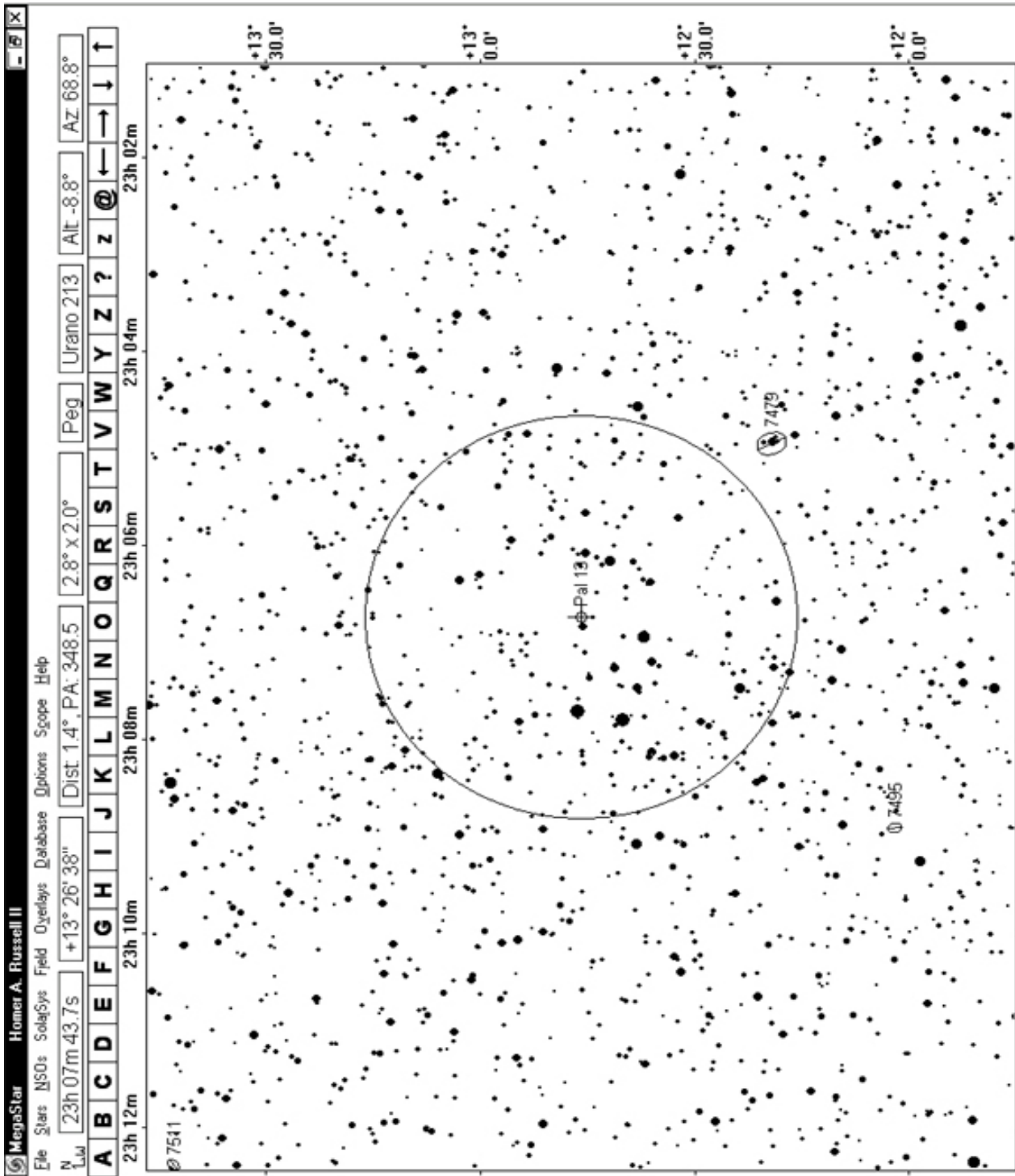


Figure 3. MegaStar Finder Chart with superimposed 1 degree field of view.

## SEPTEMBER'S METEOR SHOWERS

| NAME           | DATES          | PEAK DATE                     | ZHR |
|----------------|----------------|-------------------------------|-----|
| Alpha Aurigids | Aug 25-Sept 5  | Peaks on the 1 <sup>st</sup>  | 10  |
| Delta Aurigids | Sept 5-Oct 10  | Peaks on the 8 <sup>th</sup>  | 6   |
| Piscids        | Sept 1-Sept 30 | Peaks on the 20 <sup>th</sup> | 3   |

## VILLA RICA OBSERVATORY UPDATE

[Keith Burns, Lunatic #100](#)

Recently a new layer of plywood was added to the floor of the observatory making it much more solid. The warm-up shed door has been replaced with a solid door. We will shortly be replacing the observatory door with a custom build one. Thanks to Peter Macumber for volunteer-

ing to build the new door. The observing field has been mowed (by some anonymous person or persons). Perhaps the stealth sofa did it. Who knows? Those wanting to get checked out on the club's observatory, contact me to make an appointment. The only way you can get the combinations to the observatory building is to attend one of these. You don't need to be checked out to use the observing field. This includes the combination to the gate. If you need the gate combination, contact me and I will give it to you.

## OBSERVING EVENTS

The September orientation was held on the 12<sup>th</sup> at the Villa Rica Observatory. The reports of small green aliens being seen by some individuals was not confirmed or verified! Thanks to the *CREW*, birthday cake was enjoyed by all.

The September deep sky session will take place on the 19<sup>th</sup> at Amicalola Falls State Park. The North Georgia Astronomers are sponsoring this event and have invited the AAC to view with them. There is camping inside the park. Call 1-800-864-7275 to make reservations for a camp site. You can also call Amicalola State Park at 706-265-8888 for more information on the park. Note that we will be setting up in the parking lot at the top of the falls and not at the bottom. Directions to the site are in this focal point. As an added bonus, Dr. Jones of NGC will be doing a slide show at the visitor's center. The slides show starts at 7 PM. Note that there is a two-dollar park use fee. Pay as you enter the park.

The fall zombie party will take place on the 16<sup>th</sup> and 17<sup>th</sup> of October. The location is Cox Field. Cox field is located west of Griffin, Ga. We are co-sponsoring this event with the Flint River Astronomy Club. There will be two port-a-johns located on the site for the weekend. There is a fee of five dollars per adult per night. This cost covers the toilets. You can preregister by sending your money to me at this address (Keith Burns 3740 Burnt Hickory Rd. Marietta, GA 30064). Make your checks out to the AAC and be sure to write *Zombie Party* on the check. You can also do onsite registration for the event. Members of the FRAC will be handling the on site registration Friday night Oct. 16<sup>th</sup>. For more information contact Keith Burns at 770-426-1797 or Smitty Smith at 770-583-2200.

The annual AAC picnic will take place on October 24<sup>th</sup> at the Villa Rica Observatory. The start time for the event is 11 AM. This is also an official welcome to the Agnes Scott College Astronomy Club that is to be an affiliate of the AAC. I will have more information next month. Stick around for the Orientation/ stargaze that night. The orientation starts at 5 PM. Let's hope it doesn't rain(flood) this time. Just in case it does, our president has promised to wear his swimsuit. (*Editor's comment: Wasn't there a reference once upon a time about looking back and turning into a pillar of salt*)

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## DIRECTIONS TO AMICALOLA STATE PARK

### From GA 400:

Take 400 north to Ga 136. Turn left onto Ga 136. Proceed on Ga 136 for sixteen miles to Ga 183. Turn right onto Ga 183 and proceed for three miles to Ga 52. Turn right onto Ga 52 and proceed for one to two miles to Amicalola State Park. Turn left onto main road and proceed into park. The road will fork. Take the left fork in the road. This should be the road that leads to the top of the falls. Proceed to the end of the road. The road ends at a parking lot with a field nearby. This is where we are setting up.

## DIRECTIONS TO AMICALOLA STATE PARK

### From I-575:

Take I-75 north to I-575. Take I-575 north to Ga 515. Take Ga 515 north to Ga 136. Note that 136 is north of Jasper, Ga. Turn right onto Ga 136. Proceed on Ga 136 for nineteen miles to Ga 183. Turn left onto Ga 183. Proceed on Ga 183 for one mile to Ga 52. Turn right onto Ga 52 and proceed about one mile to Amicalola State Park entrance. Turn left and proceed to fork in road. Take left fork in the road. This should be the road to the top of the falls. The road ends at a parking lot with field nearby. This is where we are setting up.

*Note on visitors center:* Look for the signs once inside the park to find the visitors center if you plan on seeing the slides show.

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## Lunar Observing Challenge #3

### Naked Eye Targets:

1. Man in the Moon
2. Mare Imbrium - What is its English Name?
3. Crater Copernicus- Why is Copernicus easy to see?
4. Challenge: Mare Vaporum - Sea of .....?

Now that you have gotten a little warmed up to the Lunatic challenge, I'd like to introduce you to the 'consummate Lunatics' hunt ...These are a selection of 12 objects selected and rated by Pickering himself. The objects range in difficulty from 1-12 (easiest to hardest). His list will be interspersed throughout the remainder of the year. Here's your first taste of them....

Pickerings Naked Eye Challenge:

- 1) the bright areas around the Craters Kepler (rated 4), and Copernicus (rated 1)
- 2) Can you see the dark spot at the foot of the Apennines Mountain Range (rated 11!)?

### Binocular Targets:

1. Crater Plato - Is this a young crater?
2. Montes Apenninus - What seas does this mountain range separate?
3. Crater Ptolemaeus
4. Challenge: Crater Eudoxus - What mountain range is nearby?
5. Palus Epidemiarum. What does its name mean?

### Telescope Targets:

1. Crater Posidonius
2. Rima Posidonius
3. Crater Davy - Since 1994, what feature nearby became better known?
4. Promontorium Agarum. What does its name mean? What is it named after?
5. Challenge: Catena Davy... CATENA? What is a catena? (No- it's not where a Mexican buys a beer!)

# The Summer Milky Way

by Thomas Faber Copyright © 1998

We are all familiar with the glowing band of the Milky Way arcing across the sky from southwest to northeast on moonless late summer and early fall evenings. This glow represents the combined light of countless millions of stars as we look along the plane of our home galaxy. It may not be apparent at first, but a considerable amount of detail about the structure of the Milky Way can be seen with binoculars and the unaided eye if one knows what to look for. Some of what can be seen will be discussed in this article.

First a little background. The band of the Milky Way circles the sky inclined about 60 degrees to the ecliptic. Another way to think of it is if the plane of the Milky Way was horizontal, the earth's (and the other planet's) orbit would be inclined about 60 degrees to the horizontal. Travelling roughly along the band of the Milky Way is the galactic equator. This is the 0 degree line of galactic latitude. 90 degrees from the equator are the north and south galactic poles, in Coma Berenices and Sculptor respectively. Galactic longitude is measured along the galactic equator with 0 degrees being in the direction of the galactic center, 90 degrees in the direction in which the solar system's neighborhood is revolving around the Galaxy's center, 180 degrees in the direction opposite the galactic center, and 270 degrees in the direction opposite the solar system's revolution.

The Milky Way is a rather large spiral galaxy, about 100,000 light-years across. Our solar system is located about 30,000 light-years from the center of the Milky Way near the inner edge of one of the spiral arms, called the Orion Arm. The center of the Galaxy is in the direction of Sagittarius a few degrees northwest of Gamma Sagittarii (the spout of the teapot). But when we look in that direction we don't see the core because between it and the solar system are other spiral arms. The one just inside of the Orion Arm is called the Sagittarius-Carina (S-C) Arm. There also appears to be another arm between the S-C Arm and the Milky Way's core. The large amount of gas and dust in these arms blocks our view of the galactic core beyond (at least at optical wavelengths). Outside of the Orion Arm is the Perseus Arm. This arm contains many of the objects we see when we look in the direction opposite Sagittarius, or in the area of Perseus, and Auriga.

Now that we know something about the structure of the Milky Way and our location in it let's examine some of its structure that can be seen in the late summer skies. As was said before, the center of our galaxy is in the direction of Sagittarius but it can't be seen visually because of the intervening gas and dust. The actual center has been located by radio and infra-red observations to be about 4 degrees northwest of Gamma Sagittarii. Even though we can't see the center itself, we can see a structure related to the center. The Great Sagittarius Star Cloud, north and west of Gamma, is part of the central hub of the Galaxy. We can see it because it extends beyond the obscuring gas and dust of the S-C Arm. The Great Star Cloud is the combined glow of countless stars that are on average 30,000 light-years distant. At these distances, even the brightest supergiants are not visible in binoculars, but their combined light is visible to the unaided eye.

The next part of the Galaxy's structure that we will look at is the Small Sagittarius Star Cloud, better known as M24 (M24 is sometimes equated with the small galactic cluster NGC 6603, however this is not correct. M24 is the Small Star Cloud itself). This star cloud is a bright rectangular area, about 1 x 2 degrees in size, in the Milky Way several degrees northeast of Mu Sagittarii. It appears that the Small Star Cloud is over 15,000 light-years away, making it part of the spiral arm between the core and the S-C Arm. It is visible through a gap in the dust and gas of the S-C Arm. Some of the stars in this cloud are bright enough to be visible in binoculars but most of the stars seen here are foreground objects.

The third part of the Galaxy's structure that we will examine is the Sagittarius-Carina Arm itself. As was said before, this is the next spiral arm inward from our own. Most of the galactic clusters, OB associations, and

nebulae visible from Sagittarius to Carina are part of this arm, and are on the order of 5000 light-years or more from the solar system. This includes the many prominent nebulae and galactic clusters seen in Scorpius and Sagittarius.

The next part of the Milky Way's structure is the brighter stars that make up Sagittarius, Scorpius, and the other constellations in this area of the sky. These stars are part of the spiral arm that is home to the solar system, the Orion Arm. The fact that we can only see a scattering of stars in this direction that we can place in the Orion Arm indicates that the solar system is near the inner edge of that arm.

As we look northeast from Sagittarius into Scutum we are continuing to look along the S-C Arm. There are still numerous galactic clusters, and the bright Scutum star cloud. But as we continue on into Aquila there is a marked absence of galactic clusters and associations. The reason for this is the next feature of our galaxy's structure that we will examine. This lack of galactic clusters is caused by the S-C Arm curving away from our view as it spirals inward toward the Milky Way's central hub. When we look toward Aquila we are actually looking into the gap between the S-C Arm and our own arm, and hence see relatively few objects.

As we continue along the Milky Way into Cygnus, we see a marked increase in the number of galactic clusters, OB associations, and nebulae. This is because we are now looking along our own spiral arm (the Orion Arm). A few degrees northeast of Deneb is galactic longitude 90 degrees, therefore in this area we are looking into the heart of our own spiral arm.

The last feature of our galaxy's structure in the late summer sky that we will look at is the Great Rift. This feature is very prominent in Cygnus and Vulpecula, but continues farther south and makes the Milky Way appear like it is split in two. It is actually great dark clouds of gas and dust lying along our own spiral arm and blocking our view of more distant parts of the Orion Arm. This feature is exactly like the dark bands that we see when we look at many near edge-on spiral galaxies.

With the Great Rift we conclude our tour of the structure of the late summer Milky Way visible with binoculars and the unaided eye. I hope this encourages you to go out and have a look at these features yourself and enjoy the wonder of the night sky.

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## The Survey - Editorial Comment

by Peter Macumber

Over three-hundred (300) surveys were mailed out in July's Focal Point. The surveys were **pre-addressed** and **pre-stamped**. The number of surveys returned, although statistically is very good, was only 30%. That means about two-hundred (200) people did not take the five minutes required (plus one staple or piece of tape) to send us what they thought of the club. Many people spent hours setting up, printing, folding, sorting, collating, etc. I am disappointed by this. The survey questionnaires are completely anonymous, unless you put your name on it. **You can still send them in.** The Atlanta Astronomy Club is *your* Club.

I am also pleased by the preliminary results, we seem to be headed in the right direction. If you want help, want to help or just participate, stand up and be counted!



## Club Officers

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| Gil Shillcutt   | Amateur Telescope Makers                       | 404-467-1437 |
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## AAC CALENDAR of EVENTS

|                                  |                       |                   |
|----------------------------------|-----------------------|-------------------|
| September 12, Saturday           | Orientation           | Villa Rica        |
| September 18, Friday             | General Meeting       | Emory White Hall  |
| September 19, Saturday           | Deep Sky              | Amicalola St Park |
| October 16, Friday               | General Meeting       | Emory White Hall  |
| October 16-17, Friday & Saturday | Deep Sky - Zombie     | Cox Field - FRAC  |
| October 24, Saturday             | Orientation - BFQ 27% | Villa Rica        |
| November 14, Saturday            | Orientation - ALQ 21% | Villa Rica        |
| November 20, Friday              | General Meeting       | Emory White Hall  |
| November 21, Saturday            | Deep Sky              |                   |
| December 12, Saturday            | Orientation - ALQ 36% | Villa Rica        |
| December 18, Friday              | General Meeting       |                   |
| December 19, Saturday            | Deep Sky              |                   |
| December 31, Thursday            | New Years Eve         |                   |

## Focal Point

The September Focal Point is a little late this month. Computers have a mind of their own and control their owners, not the other way around. I was lucky and had managed to complete a hard drive backup just prior to a complete hard drive failure. The implications of not having a backup are mind boggling, if not down right scary. We could have lost the current membership list, the current bank accounts and the rest of my limited sanity along with some close collateral damage. Enough said, backup and then backup some more.

**October's Focal Point will be published on October 1<sup>st</sup>**, please submit your articles before **September 28<sup>th</sup>**. I will be going away on the weekend, starting October 2<sup>nd</sup>, I won't be able to wait for anyone!

The Focal Point is available in *colour* online via e-mail in PDF format. The free Adobe(R) Acrobat(R) Reader allows you to view, navigate, and print PDF files across all major computing platforms. PDF stands for Portable Document Format. The reader, Adobe Acrobat, can be downloaded from <http://www.adobe.com>. This is a free product. More information is available at the ADOBE web site.

Send me and e-mail, I will send you a Focal Point. If you like it, we will stopsending you a copy snail-mail. It will also save the club a dollar.



Newsletter of The Atlanta Astronomy Club, Inc.

FROM:

Peter Macumber

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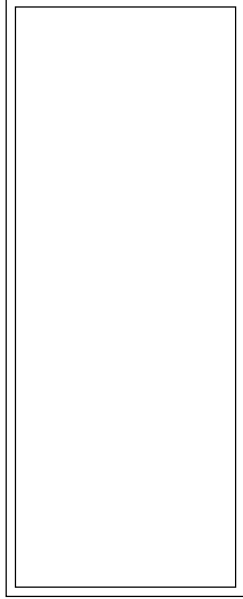
*We're here to help! Here's how how to reach us:*

Atlanta Astronomy Club

3595 Canton Road, Suite A9-305

Marietta, GA 30066

**FIRST CLASS**



## Atlanta Astronomy Club

### SEPTEMBER

#### **General Meeting - Emory White Hall - Friday, September 18th - 8:00 PM**

Refreshments will be served from 7:30 - 8:00. Come early and socialize before the meeting.

#### **Solar Eclipses - Past, Present and Future**

Phil Harrington, the well known author of the bestsellers STAR WARE, TOURING THE UNIVERSE THROUGH BINOCULARS and ASTRONOMY FOR ALL AGES, will present a talk on Solar Eclipses.

Phil's books have served as a valuable source of information for amateur astronomers all over the world

Phil Harrington is an ardent amateur astronomer from Smithtown, New York. Bitten by the "astronomical bug" while watching the total lunar eclipse of April 1968, Phil has spent countless hours touring the universe through telescopes and binoculars. He is a former staff member of New York City's Hayden Planetarium, and continues to educate the public on the science and hobby of astronomy through courses taught at the Vanderbilt Planetarium in Centerport, New York (Long Island).

He has just released another new book (again, through John Wiley & Sons) entitled ECLIPSE!, which discusses everything one needs to know about observing solar and lunar eclipses. You'll find excerpts on Phil's homepage. Phil will also be coming out with another new book later this year: THE DEEP SKY: AN INTRODUCTION (Sky Publishing). He has written extensively for Astronomy, Deep Sky, and Sky & Telescope magazines. For these achievements, he received the Astronomical League's Northeast Regional Award for 1991.

A native of Rowayton, Connecticut, Phil now lives on Long Island's north shore with his wife Wendy and daughter Helen. By day, he works as an environmental engineer at Brookhaven National Laboratory.

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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.

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**.

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