

THE FOCAL POINT

The Atlanta Astronomy Club, Inc.

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November, 1996

1947-1997 Celebrating Fifty Years of Astronomy in Atlanta

The November 15th Meeting - Pluto!

by Lenny Abbey

The Atlanta Astronomy Club will hold its next meeting on November 15 at Emory University's White Hall. The meeting will begin at 8:00 p.m. Our speaker will be Dr. Marc Buie, of Lowell Observatory.

In recent years the epic journeys of the Voyager, Pioneer and Viking spacecraft have brought us amazing detailed views of our solar system. The only planet we haven't visited is remote Pluto. Nevertheless, the telescopic exploration of Pluto has entered a new age with the advent of the Hubble Space Telescope. Our speaker, Marc Buie, is a leader in the investigation of Pluto. A Lowell Observatory astronomer, Marc devotes most of his time during the "Pluto season" to observing that planet. Before the Hubble Telescope's Pluto project, he constructed a map of Pluto and Charon from the eclipse light curves during the recent passage of the Earth through the plane of the Pluto-Charon system. The Hubble images allowed much more detailed maps to be constructed.

You will not want to miss this meeting! Marc is a leader in this fascinating field, which is of particular interest to amateur astronomers. We are bringing him to Atlanta (by virtue of our speaker's fund) to talk to the club. He will also be giving a seminar at Georgia State University. Don't miss his video of the rotating Pluto-Charon system!

Calendar Notes

November 15 Meeting at Emory Univ.

November 16 AAC Broad Meeting

November 18 East Coweta High School,
contact Steve "Smitty" Smith

December 13 AAC Meeting (TBA)

December 14 Beginner's Session At Villa Rica

News Item

At the beginner's observing session, November 2, it was discovered that the 24mm wide field eyepiece was missing. If you picked it up by mistake, please return it to the observatory eyepiece box. We have relatively few eyepieces at the observatory and they are to be available to everyone.

12/14/96- BEGINNER/PUBLIC OBSERVING SESSION

LOCATION: Villa Rica, Barber Observatory

START TIME: Dusk.

DESCRIPTION: Join the Atlanta Astronomy Club to get hands on instruction in beginning astronomy and observe the Messier Objects. Learn how to use that telescope before setting it up for the Kids!

AAC OCTOBER MEETING

by Jack Warner

The October meeting of the Atlanta Astronomy Club was held on October 18, 1996 at Emory University's White Hall at 8:00 P.M. with 44 members present. AAC President, Doug Chesser, after opening the meeting, asked each of the committee chairmen to report on their committee's activities.

Larry Higgins, Observing Chairman, reported that the club has been very busy the last six to eight months with "Sidewalk Astronomy" events. The club has scheduled the following observing sessions and "Sidewalk Astronomy" events.

- October 25 - Sidewalk Astronomy event at Beaverbrook Elementary School. Since there will be 350 people present, the need for a lot of telescopes and volunteers from the club is obvious. If you are willing to participate in this event, please contact Larry Higgins.
- November 2 - Beginners Observing at the Villa Rica Observatory.

- November 8-10 - First Annual AAC Die Hard Observers Party will be held at Dauset Trails. This is an observing session only; no speakers have been scheduled. Wear warm clothing!
- November 18 - This is a Monday night session. The East Coweta High School astronomy class will be observing at the school. An evaluation of this site will be made to determine if the sky will be dark enough at this location for the event. Club members and their telescopes are needed. If you can participate, please call Steven "Smitty" Smith at 770-583-2200 for directions.

Larry Higgins concluded his report by awarding a Messier Certificate and Pin to Phil Sacco. Phil Bracken, Treasurer, reported that most of the club's current funds are in the observatory account and there continues to be an urgent need for contributions to the Speakers Fund. The recent extraordinary audio-visual expenses have contributed the reduction in the Speakers Fund. Phil encouraged the membership to contribute to this fund and the Refreshment Fund. He indicated that the club currently has 224 family memberships.

In response to inquiries concerning the magazine *Sky & Telescope*, Phil gave a brief overview of the renewal procedures for the magazine. The publisher has requested that club subscriptions not be mailed individually but accumulated and submitted in a reasonable time frame. Because of this request, subscriptions are sent to *Sky & Telescope* the first of each month. To help avoid a delay, members may mail renewals directly to Phil's home.

Rich Jakiel, Newsletter Editor, advised the membership that November 1 is the deadline for articles that are to appear in the November issue of *The Focal Point*. Rich reported that interesting articles submitted for publication in *The Focal Point* may also be submitted for publication in *Amateur Astronomy*.

Art Russell, Publicity and Beginners Interest Chairman, reported damage to the power supply for the 20 inch telescope at Villa Rica. Art indicated that future problems at the observatory need to be reported as soon as possible to avoid further damage to the equipment. It was requested that if a problem does occur, place a note on the equipment and contact a club officer. Art reported that the transformer has been replaced and the telescope is ready for use.

Doug Chesser concluded the business meeting by reporting on the following items. Art Russell maintains the club events schedule. Please contact him with information concerning planned events for

inclusion on the master schedule and thereby avoiding scheduling conflicts.

A review of the proposed new club logo is tentatively scheduled for the regular meeting in November. Stephen Blalock, Web Page Manager, was acknowledged by Doug for his outstanding work in maintaining the club's web page.

The next Board of Directors meeting will be held November 16 at Tushar Thirivikraman's home. In early November, Doug will provide further information about the meeting.

A volunteer is needed to assume the responsibility of mailing out the new members' packets. Leonard Abbey has been doing a good job with this responsibility for several years but will not be able to continue because of his other commitments. Any member interested in assuming this responsibility, please contact Doug Chesser.

Doug thanked those who helped with the viewing session at Murdock Elementary School on October 17. Recognized for their help with the 200 participants were Tom and Lynn Crowley, Phil Bracken, Phil Sacco, Eric Shelton, and Alex Langoussis.

Tim Puckett has recently moved to North Georgia and has invited the Atlanta Astronomy Club along with several other astronomy clubs to an open house to be held on March 8th. More information concerning this invitation will be announced later.

Ken Poshedly, Peach State Star Gaze Chairman, reported that the Star Gaze will be held May 1st through the 4th and chances are that it will be at the same location, Indian Springs Park. The two speakers will be Michael Kitt, author of *Observing the Moon* and Tippy D'Auria, expert on telescopes.

Doug Chesser reported that the Chiefland Star Party was a success and highly recommended the site. There is a five dollar fee for use of the site and the facilities. Phil Bracken announced that he and Phil Sacco will be at the Villa Rica Observatory on Saturday, October 19 with Boy Scouts working on their Astronomy Merit Badges.

Following the business meeting, Leonard Abbey introduced Dr. Ben Zellner, who gave a presentation on the asteroid Vesta.

Refreshments were served after the meeting.

The *Ultimate Observing Challenge*

by Richard Jakiel

Completed the Messier Certificate ages ago? Have you finished the Herschel "400" and found it "wanting"? Has hunting down 15th magnitude galaxies in Virgo become *passé*? You may be ready to take on the *Ultimate Observing Challenge*.

Sooner or later everyone reaches a point where this hobby can become stale, even boring. This often affects the more advanced observer, someone who has completed most of the "simpler" certificates and programs. Perhaps the best way to get out of the observing doldrums is to take on new and challenging projects. My personal projects include making drawings of interesting deep-sky objects and observation of structures in external galaxies (spiral structure, globular clusters and H II regions). Barbara Wilson has seen almost all of the globular clusters associated with the Milky Way Galaxy. Barbara, Larry Mitchell and Alister Ling like to hunt down obscure deep-sky objects that were previously "unseen". Tom Polakis likes to hunt down faint dwarf galaxies of nearby galaxy groups. Steve Gottlieb and Jack Marling have made and compiled observations on over seven hundred planetary nebulae. Other well-known deep-sky enthusiasts have pursued challenging programs around their particular interests.

But every list or program has its most difficult challenge. For example, someone working on the Messier list might consider the 11th magnitude M97 (Owl Nebula) as one of the most demanding to observe. However there are some objects that defy all attempts, no matter how large the scope or seasoned the observer. Many of these are relatively well known, and very few (if any) ever view these most elusive objects. The "Mount Everest's" of amateur astronomy, these seven objects (the magnificently hard seven) comprise the *Ultimate Observing Challenge*.

1) *Simeis 147* RA 5hr 39.1' Dec +28° 00' (2000)

Also known as Sharpless 2-240, this beautiful lacy nebula is a supernova remnant (SNR) in Taurus. It has been compared to the better known Veil SNR in Cygnus in delicate beauty. Before the late 1980's, this object was considered "unobtainable" due to its extremely low surface brightness. The use of nebula filters soon changed the rules of this game. In 1991, Alister Ling (*Deep Sky* 37, 32) armed with an O III filter and a 12.5-inch scope was perhaps the first person to view a few faint fragments of this elusive nebula. Even today this is considered a very difficult

object to observe as it requires large aperture under very dark skies.

2) *Pluto + Charon*

Until Stephen J. O'Meara observed this planetary pair only a few years ago, this was considered an exceedingly difficult object for the visual observer. It was even considered for the *AINTNO* list of "impossible visual objects". Originally generated by Barbara Wilson and Larry Wilson, the *AINTNO* list is an acronym for *Association of Invisible Nebulae and Things Nobody Observes*. Its a very tongue in cheek organization! Observing just *one* object you will be issued a black certificate with black ink on it. Of course the list includes such wonders as the "G" ring of Saturn (Aintno 31), 3C 273's jet (Aintno 37), and planetary nebulae in M81 (Aintno 90).

Kidding aside, resolving Pluto and its moon Charon is no easy trick. During mean opposition, Pluto has an apparent magnitude of 14.9, while Charon is a much dimmer 16.8. Currently this system has just past perihelic opposition (1989), and the apparent magnitudes are at a "brighter" 13.7 and 15.6 for Pluto and Charon respectively. The orbit is highly inclined and has a maximum separation of 0.9" and an orbital period of 6.39 days. Mutual occultations are relatively common and have provided great insight into size, albedo and surface mapping of the system.

To resolve this pair, high magnification and resolution is a must. The satellite is at a dim ~15.6 magnitude at its brightest, so dark transparent skies are also a must. At least 18 to 20 inches of aperture plus magnifications over 400 are required to see this most elusive pair. Observations should be made during maximum elongation, else you could "duplicate" G.P. Kuiper's observations of Pluto during 1950. He measured the diameter of Pluto using the 200-inch at Palomar and never saw Charon. It seems that each time he observed, Charon was either being occulted or in transit across Pluto!

3) *Einstein's Cross* RA 22hrs 40' 29.8" Dec +3° 21' 30" (2000)

Einstein's Cross, or G2237+0305 is perhaps the best known gravitational lens in the northern sky. A distant quasar is "split" into four parts by a closer foreground galaxy. The gravitation field of the galaxy bends and refocuses the light from the distant quasar into four roughly equal components. This galaxy has a designation CGCG 378-15, a 14th magnitude system in

the constellation of Pegasus. This galaxy is not very difficult to view even with moderate aperture but the quasar is a different story. The much fainter lensed quasar has a total integrated magnitude of only 16.8 (visual). The southern component A has a magnitude of 17.2, component B (northern) is 17.2 magnitude, C (eastern) is 17.5 and D (western) is the most difficult at 18.0 magnitude. With a 20-inch, Barbara Wilson (who has also provided much of the information on this object) has seen 2 components, and all four with a 36-inch scope. The key to seeing "the cross" is a combination of large aperture, very dark skies and excellent seeing conditions.

4) Abell 85 (CTB 1) RA 23hr 59.3' Dec +62° 27' (2000)

Abell 85 is a large supernova remnant (SNR) located in Cassiopeia. Originally catalogued by George Abell as a planetary nebula, it soon became evident that it was actually a SNR. It was also recognized as a radio source and acquired the alternative designation CTB 1. According to Brian Skiff, Abell 85 has relatively weak [O III] and H-beta emission compared to the "traditional" supernova-remnant lines of H-alpha, [NII], and [SII]. For visual observers, the gain in contrast using [O III] and H-beta filters appears to be minimal. Likewise, the digital sky survey reveals only a low-surface brightness object on the red POSS-1 image, while it was invisible on the blue light image. Skiff suggested that the SNR may not be a visual object.

Shortly after Skiff's informative posting on *sci.astro.amateur*, two German observers published an extensive catalogue on galactic nebulae in the January 1996 issue of the *Webb Society Quarterly Journal*. Andreas Alzner and Ronald Stoyan observed the nebula at 70x using a 50cm (20-inch) telescope equipped with an O III filter. Though listed as "very faint", their success clears the way for more observations by serious amateurs. For those seeking a difficult challenge, here are a few important statistics:

Center of Abell 85: 23hr 59m +62.5 (2000)

Diameter: 35'

Brightest Segment: 23hr 57.5' to 00 00.5 at 62.2 Dec (2000)

These numbers were originally posted by Brian Skiff on *sci.astro.amateur*. Good comparison photos can be found in van den Bergh *et al.* 1973 (*ApJSuppl* 26, 19) and on page 55 of the *Sky and Telescope* 1971 monograph *The Planetary Nebulae* by Lawrence Aller.

5) UKS 1751-241 RA 17hr 54.5' Dec -24° 09.0'

Located deep in the Sagittarius Star Cloud, UKS 1751-241 is a highly obscured globular cluster. Listed at 17.3 magnitude and less than 1' across, this is considered by many as one of the most difficult globular clusters in the sky. Its location in a dense star doesn't help much, either! Big aperture, very dark skies and accurate star charts are the best means to tackle this "Holy Grail" of globular clusters.

6) Hickson Galaxy Group 50 RA 11hr 14' 14.9" Dec +55° 11' 33.4" (1950)

Observing the Hickson Catalogue of compact galaxy groups is a current favorite among advanced amateurs. There are 100 compact groups comprised of over 400 member galaxies in Paul Hickson's 1994 *Atlas of Compact Groups of Galaxies*. Some of the most famous "Hickson Groups" include Stephen's Quintet (Hickson 92), Seyfert's Sextet (Hickson 79) and the NGC 3190 Group (Hickson 44) in Leo. Although some groups may be spotted with an 8-inch scope, many groups have members no brighter than 15th magnitude requiring large instruments and good observing skills to spot.

Hickson 50 is by far the most difficult of a generally tough catalogue of galaxy groups. There are 5 tiny members of this extremely distant galaxy group. The brightest member, "A" registers at a grim 18.4 magnitude, far beyond the reach of all but the largest amateur scopes. Members "B", "C", "D", and "E" are magnitudes 18.5, 19.3, 19.2 and 19.7 respectively. Amazingly, Barbara Wilson and Larry Mitchell have spotted this elusive little group with a 36-inch scope under the pristine skies of the Texas Star Party. Nonetheless, this group pushes the "edge" of what can be observed and is one of the most difficult objects in this list.

7) PK 009-07.1 (IRAS 18333-2357) in M22 RA 18hr 33' 20.3" (1950) Dec -23° 57' 52" (1950)

If any object is impossible to see, this small planetary nebula comes close! Located deep in the heart of the great globular cluster M22, this object has defied every observing attempt. And yet, there may be some hope.

This most unusual planetary nebula was first recorded in the *IRAS Point Source Catalogue* (1985). It is a member of a rare class of halo planetary nebulae and bears certain similarities with Pease 1 (K 648) the

only other PN in a globular cluster. This peculiar object lacks the characteristic H and He emission lines, with only [O III] and [Ne III] present (1991, *ApJ* 379 168). There is a substantial amount of dust accounting for the distinct infrared emission. Measuring 10" x 7", the estimated magnitude is ≥ 15 , though the lack of visual confirmation suggests it may be considerably greater. The PN forms part of an optical triplet only 1' from the core of M22. The other two "components" are faint 14 and 15 magnitude stars separated by less than 2 arc-seconds (1989, *ApJ* 338 862).

Visual Observations:

Before attempting this object, try Pease 1 in M15. It is visually at 13th magnitude and located several arc-minutes north of the globular's core center. Alister Ling (1990, *Deep Sky* 32 36) gives a good write-up on how he finally succeeded in locating this PN.

Unfortunately, our little PN in M22 is a much more difficult customer. Many serious observers have attempted with apertures up to 25-inches with *NO* success. I have tried this several times, the last at the Chiefland Starfest in 1996. Using a detailed finder chart of M22 and Vic Menard's superb 20-inch f/6.2 dobsonian we gave it our best for almost an hour. Using magnifications over 400x, and an O III filter we just could not pick out this PN from the haze of unresolved stars in the core. And that's the paradox. Its emission is the strongest in [O III] lines, but this type of filter is best used at lower magnifications. However, to separate the nebula from the extremely dense stellar background high power is required. The O III filter "mushes" out the very faint stars turning it into a diffuse background haze. Perhaps a very large scope (> 30-inches), coupled with very dark and *steady* skies an observer may be able to ferret this nebula. A sliding filter bar with both UHC and O III filters would be an invaluable tool.

Honorable Mention:

While writing this article, I also posted my list to the *sci.astro.amateur* newsgroup. I received several interesting responses and some email from both Barbara Wilson and Tom Polakis. Barbara gave me some background information on *Einstein's Cross* and the *AINTNO* certificate. I found out that Grindlay 1, a "supposed" superfaint globular cluster didn't even exist, so I replaced it with the UKS globular. Tom suggested a few nasty dwarf galaxies that could be added to this list:

M81 DW A (8hr 23.5', +71° 03') ..A member of the M81 group of galaxies. I called it an "averted vision object on the POSS".

The Sextans Dwarf (10hr 13.2', -01° 37')...Discovered in 1990 on UK Schmidt plates. Didn't see it in my 13-inch, but that doesn't mean anything, now that folks are using 36-inch dobsonians out there.

The Tucana Dwarf (22hr 41.7', -64° 25'). Also discovered in 1990. I didn't see it with from Chile with a 13-inch.

Of course there are other challenges awaiting the serious observer out there. But not all require huge aperture to see. Next time, try to locate the Fornax or Sculptor dwarf galaxies with a richfield scope. Or just hunt down all the Messier objects using just 50mm binoculars. With some patience and skill, you'll soon find out what is your observing "envelope".

Your Ad or Article Here!!!

Do you have an old telescope that you're not using anymore, or a few extra eyepieces gathering dust?

Or, are you looking for a smaller, more portable scope to take on dark sky vacation spots?

If you do, or just want to buy/sell something related to astronomy - Please place your ad here!

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Drawing Down the Moon

By Art Russell

Like most good, faithful and loyal deep sky Zombies, I hate the Moon. About the only positive thing I can say about it, as a deep sky enthusiast, is that the Moon gives me a chance to catch up on my sleep. After all, how do you "deep" observe an object that by its very nature ruins your night adaptation for an entire evening? Moreover, why bother observing the Moon since "everybody" has seen it!

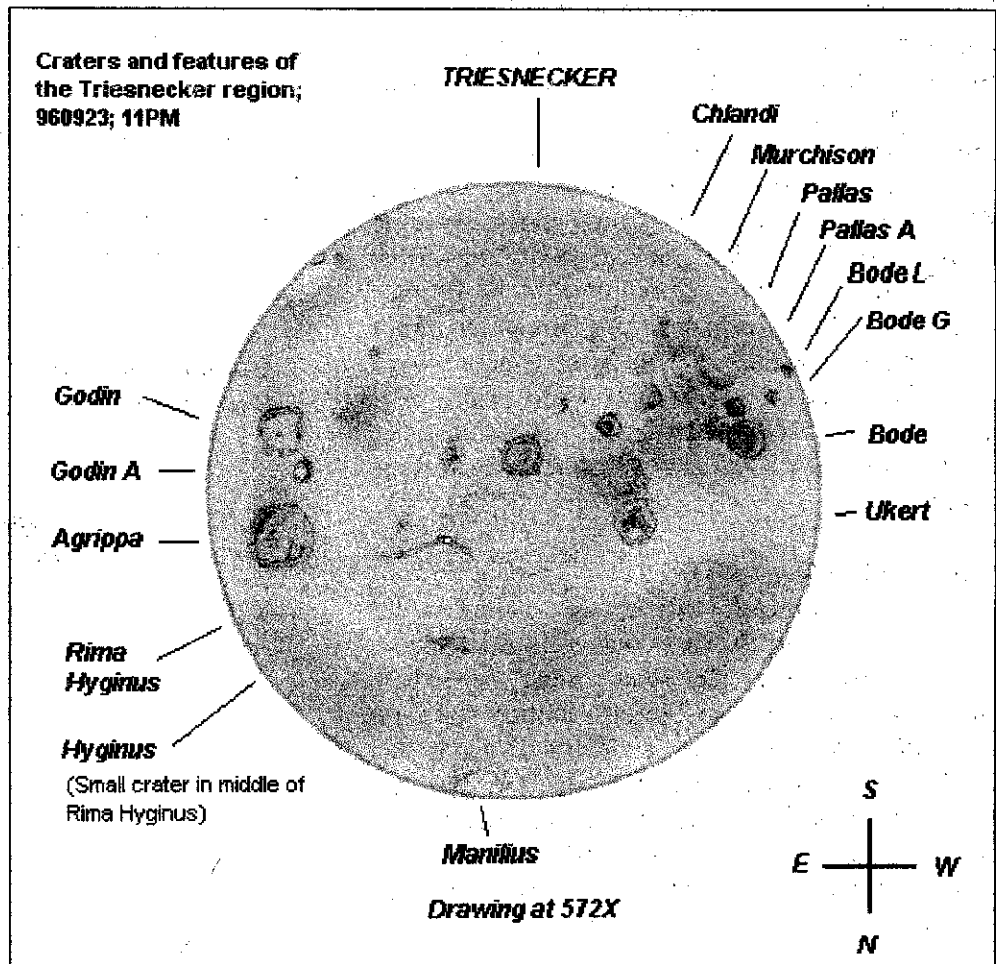
However, recently, I decided to draw a few of the objects for the AAC's Visual Impressions Program sponsored by club member Rich Jakiel. Prominent on the list was the bane of all children of the night, the Moon. If you thought I was a little miffed by that addition, you've figured me out. I don't know who first thought up the slogan "Nuke the Moon," but his sentiments capture my attitude exactly.

How and where? I certainly didn't want to make a production of this drawing. After all, my drawing skills are at best rudimentary (ask Jane, ... she just smiles). Moreover, I really didn't relish the idea of dragging out my own dobsonian just to draw the moon. However, I thought the obvious answer to that problem would be to make a quick trip out to Villa Rica and use the observatory's 20inch Newtonian for just enough time to dash out a quick drawing. I mean, how long could drawing a small area, the region of the Triesnecker crater, take. The Moon is not that far away and its features are very clearly illuminated. Shouldn't be a problem at all. 15 minutes, tops. Right?

Well, maybe I was bit premature in my assessment of the situation. In truth, the task turned out to be a bit more difficult than I had anticipated.

No doubt, you'll agree with me that locating the Moon is not a big deal. Locating the Triesnecker region turned out to be something altogether different. After all, here I was under a nearly full Moon; the whole region should be illuminated. Well, I got that part of it right anyway. The whole Triesnecker region was

illuminated. However, as I was to discover to my chagrin, when the Moon is fully illuminated, its features lose contrast and the smaller details are lost. Try observing an area of the Moon at quarter illumination and then at full illumination and you'll see how much difference there is in their appearance. However, undaunted, I pressed on, finally locating the Triesnecker region at a moderate magnification (By the way, I recommend you beg, borrow or "steal" a good atlas of the Moon in order to tackle this project. Kalmbach Publishers, publishers of Astronomy Magazine,



is now carrying the excellent "Atlas of the Moon" by Anotnín Růkl. If you should decide to buy your own copy, order it through the club for a 10% price break). In order to see any possible details, I had to go to my highest power, 572X. Guess what? I had to find the Triesnecker all over again, but admittedly, I was starting to get comfortable with the Moon (and NIGHTBLIND!), so it didn't take nearly as much time as previously. Nevertheless, it took me a good 30 minutes to finally zero in on the Triesnecker region at high power. So much for a quick dash out to Villa Rica! I could already tell this was going to take far longer than I had imagined. As I was drawing the Triesnecker region, I also discovered that the 20" didn't accurately track the Moon. Oh, it was close, but I continually needed to use the photo-guide control pad to fine adjust my field of view before the Triesnecker region drifted out of view. My tracking difficulties were not the fault of the telescope. Rather, I'd forgotten to consider that the Moon is moving against the sky at a different rate than the stars which the telescope has been designed to track.

I guess I was as successful as can be expected for a first attempt at drawing the Moon, although it did take over 2 1/2 hours to do my "quick" drawing. More importantly, in the process I gained a new respect for those who "just" observe the Moon. Mind you, I'm still a Zombie at heart. However, now I've added another possibility for observing projects if I want to give up any thought of ever sleeping or spending time with my wife! I've also gained additional respect for what can be done with the club's 20" Newtonian at Villa Rica.

Who will be next to take up the challenge of observing and drawing the Moon at Villa Rica? You may yet find me there under the light of a full Moon, once again ferreting out obscure craters, rills and valleys. I hope to see you there! Clear Skies!

Tales from the "Dark Site" - The Dreaded Shaving Mirror!

by Richard Jakiel

From time to time, all of us have pulled a "groaner", an action so stupid that people will actually feel some pity. I'm no exception. Fortunately, noone was hurt (other than my ego) but the memory lingers on.

I was on my way to the Chiefland Starfest (Oct. 11 to 13, 1996) with Phil Bracken. The night before we loaded his van with most of my equipment. I swept the area and I was sure *all* essential equipment and observing aids have been accounted for. Friday morning we loaded my bags and left my house at 8 A.M. - right on schedule.

Now the trip from Atlanta, Ga to northern Florida isn't exactly the thrill of my life. To tell you the truth, it's a flat stretch with lots of trees and obnoxious billboards. A few of the billboards can be mildly amusing. One of the most notable is *Cafe Erotica*, a sleazy little truckstop south of Macon, Georgia. It features nude dancers and waitresses, plus some pretty nasty food. Well, I guess people who stop in there aren't usually interested in the *haute cuisine*.

Phil and I began talking about the merits of good collimation. I have absolutely no idea what the connection is between a strip bar and good optical alignment but it happened. I began to tell Phil about the odd construction of my homebuilt secondary cage - then the horror! I had a flashback, my mirror cage plus secondary are *still* in closet! I slammed my fists down hard on my legs and shouted some pretty arcane profanity. I was over three hours from Atlanta, and there was no turning back. Yes friends, I had brought a 17.5-inch *shaving mirror* to the starparty!

Like the Galileo spacecraft, I was able to salvage about 75% of my viewing. I was able to borrow some scope time from several observers in our group. I watched Doug Chesser play strange computer games when it was cloudy Saturday night. I also did a great deal of deep-sky binocular viewing under Chiefland's very dark skies. But I also learned that *Cafe Erotica*, collimation and 17-inch shaving mirrors have a deeper "philosophical" connection.

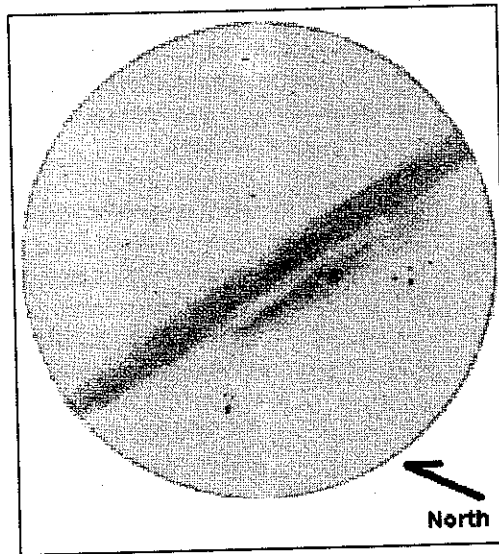
Beginners' Star-Hops; November, 1996

By Art Russell

The air is finally clear as our southeastern humidity has fallen to acceptable levels. What does this mean to us as astronomers? One of the most important benefits of low humidity is decreased haze and its associated sky-glow, the bane of all good astronomers. With the decrease in sky-glow we can now much more readily find low surface brightness objects which could be best seen only as a pale ghost of themselves only a month ago. This month's star hops will take us to two low surface brightness galaxies who's visibility noticeably improves with the decrease of atmospheric moisture and sky-glow, **M31**, the "Great Andromeda Galaxy," and **M33**, the "Pinwheel Galaxy." Along the way, we'll take a few side trips to **M31**'s companion galaxies, **M32** and **M110**, with our final destination being **M74**, a sometimes difficult to observe faint galaxy in the constellation Pisces.

This month's star-hops will be near the **Zenith** (which is located directly overhead) 10 PM on the evening of 15 November and therefore easier to find. Like last month, we'll use the "Great Square of Pegasus" as our starting point for this month's star-hops. Take a quick look at our accompanying map for our star-hops. You should see that the "Great Square of Pegasus" is aligned essentially north-south and east-west. This one aspect will help us quickly locate this month's star-hops.

Star-Hop #1, M31, NGC224, the "Great Andromeda Galaxy," M32, NGC221, and M110, NGC205. We start off this month with one of my favorite objects, **M31**. Once the sky gets dark enough, this galaxy seems to go on and on. Moreover, you don't need a high-tech telescope and digital setting circles to find this object; it is visible to the naked eye under dark country skies and even at Villa Rica! There are several ways to locate **M31**. However for this month we'll start at the "Great Square of Pegasus." Once you have located the "Great Square of Pegasus" find the northeastern most corner star, *Alpha* (α) *Andromedae*, *Alpheratz* (actually in the constellation Andromeda although a part of the "Great Square of Pegasus"). From there imagine a letter "V" such as the "V for Victory" made with your first two fingers on your hand. Extend this imaginary "V" to the northeast of *Alpha Andromedae* for about 7 degrees, the distance spanned by your four fingers held at arms length against the sky (incidentally, the length of your fingers in a "V" are about the right length here as well). Here you will find the stars *Delta* (δ) *Andromedae* and *Pi* (π) *Andromedae*. Continuing in the same general direction to the northeast, we extend another imaginary line about the same distance as before, except this time to the stars *Beta* (β) *Andromedae* and *Nu* (ν) *Andromedae*. From the northern most of these two latter stars, *Nu* (ν) *Andromedae*, it is only about 1 1/2 degrees, or little more than the width of one of your fingers, to **M31**. In binoculars and small telescopes, **M31**'s galactic bulge will appear as an oblong haze with an increasing concentration of stars in its central nucleus. The edges of the galactic bulge or halo fade uniformly although there are hints of lane structure evident. Moderate sized telescopes will reveal a very bright center with and intense concentration of stars. In size, **M31** will generally be one of the biggest objects you can see in your binoculars or telescope (where it often takes up many fields of view even at the lowest magnification).



M31's central portion @ 15X; 3 inch Refractor

M32, one of **M31**'s several companion galaxies is located only about 20 arcminutes due south of **M31**'s nucleus and is generally not easily visible with small binoculars or small telescopes except at high

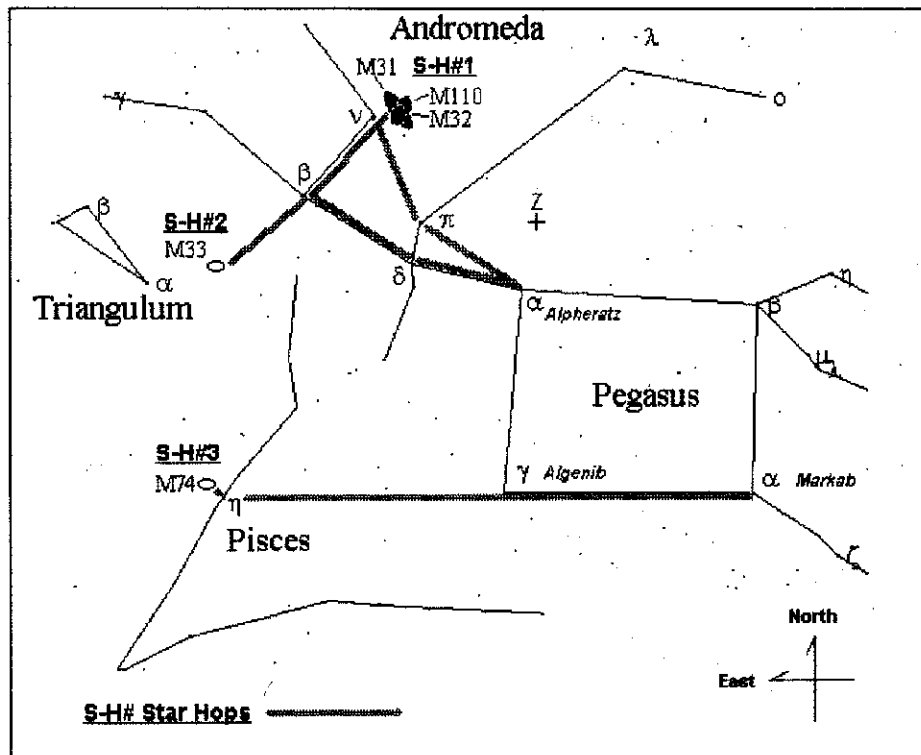
power. A medium sized telescope will reveal M32 as a compact, but diffuse galaxy. To find it, scan south of M31's nucleus where you'll find M32 as a bright concentration of light.

M110, another of M31's companion galaxies is located about 1/2 degree northwest of M31's nucleus and like M32, is generally not easily visible with small binoculars or small telescopes except at high power. Similarly, in a medium sized telescope, M110 is relatively compact with a relatively bright central core and diffuse body. Of the two companion galaxies mentioned, M110 is perhaps twice as large as M32.

Star-Hop #2, M33, NGC598, the "Pinwheel Galaxy." Head for a dark site to find this galaxy. You'll be glad you did! M33 is another galaxy located near the "Great Square of Pegasus." Lets start from *Beta Andromedae* which you already found in the last star-hop. From *Beta Andromedae*, M33 is about 7 degrees to the southeast. There, under dark and transparent skies, you may even be able to see M33 with the naked eye (but you will need good eyes). However, finding M33 can prove to be difficult. If your skies are less than pristine, M33 becomes increasingly difficult to find as it is a relatively low surface brightness face on spiral galaxy. That said, if you find it under good skies, you won't forget it! In binoculars M33 appears distinctly oblate in shape and looks much like a dim patch of soft light. Its body is broadly concentrated with no stars resolved. In medium sized telescopes under less than pristine skies M33 may appear as an unresolved low surface brightness concentration of light with little or no details.

Star-Hop #3, M74, NGC628. M74 is an often overlooked galaxy also in the general area of the "Great Square of Pegasus." The biggest problem with finding M74 is the perceived lack of good "finder" stars in the area. However, given the proximity of the "Great Square" and *Eta Pisces* in the constellation Pisces, this is a fallacious assumption! Enough said; lets head back to the "Great Square" to get started. In this case locate the two southernmost stars in "Great Square," *Alpha (α) Pegasi*, *Markab* to the west, and *Gamma (γ) Pegasi*, *Algenib*, to the east. Extend an imaginary line from *Alpha Pegasi* through *Gamma Pegasi*. Continue this line to the east for a distance of about 18 degrees, or a bit more than that between *Alpha Pegasi* and *Gamma Pegasi*, or just a bit less than that the distance spanned by your thumb and little finger held at arms length against the sky. At this location you will find the star *Eta (η) Pisces*. From

Eta Pisces, M74 is a little more than 1 degree to the east-northeast, or the distance spanned by your little finger against the night sky at arms length. In medium sized telescopes M74 should be visible at low power as a faint smudge of nebulosity distinct from the background sky. At higher powers the galaxy stands out a bit better, but this galaxy will reveal little detail.



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

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THE FOCAL POINT

Newsletter of The Atlanta Astronomy Club, Inc.

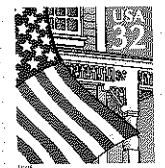
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The Atlanta Astronomy Club Inc., the South's largest and oldest astronomical society, meets at 8:00 p.m. on the third Friday of each month at Emory University's White Hall or occasionally at other locations (check the hot line for details). Membership is open to all. Annual dues are \$20 (\$10 for students). Discounted subscriptions to Astronomy (\$20), and Sky & Telescope (\$27) 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.

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