



LUCKY THIRTEEN FOR DSRSG '95!

13th Annual Deep South Regional Stargaze

Thirteen was indeed a lucky number for the 145+ observers who traveled to Percy Quin State Park near McComb Mississippi for this year's Deep South Regional Stargaze. The last two DSRSGs have been practically clouded-out, so the near-perfect skies which greeted this year's Stargaze provided a much needed boost to both attendance and enthusiasm.

Dorothy and I got our usual somewhat late start (around noon) due to work schedules, but we were in McComb by about 3:30pm even though we made a couple of stops along the way. After arriving at the DSRSG observing field (where we were reunited with Ginny and Tony Kramer, who were already set-up and

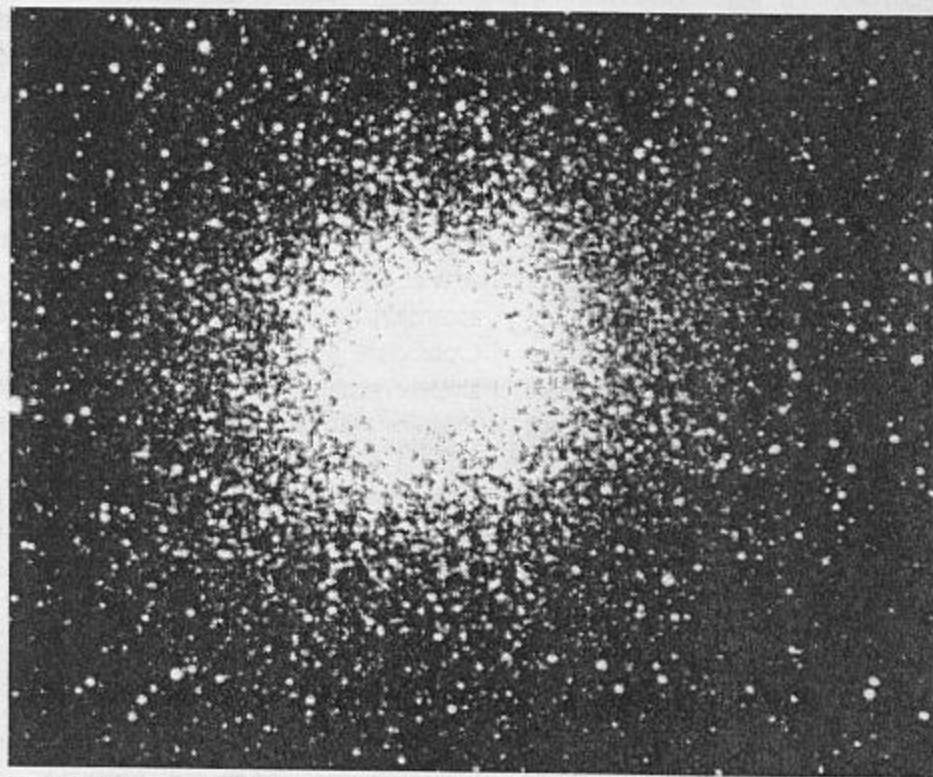
ready to go), we went about erecting our tent canopy and setting up the C8 in anticipation of what we hoped would be a good night for deep sky observing. In truth, I didn't know *what* to expect from the weather this time. Although a cold front, which was due to move in on Friday the 20th, brought the promise of clear skies, the remnants of Tropical Storm Roxanne complicated the picture. While we were setting up, another longtime MAS member, Wayne Hester, arrived with his trusty Coulter Odyssey. A trip to Mr. Whiskers for some excellent catfish helped take our minds off the weather situation while we waited for darkness.

As the sun set, it became apparent that we were in for a good, but not great, evening of viewing. While the few clouds that had been hanging around all day dispersed, there was a slight but noticeable amount of haze in the sky which kept the sky from rating a perfect '10'. Unfortunately, the growth of McComb and the installation of more streetlights in the park means that this site may never again rate a 'nine' or 'ten' as far as darkness of the sky goes.

Like many of the observers on the field, the first target for my scope was the recently discovered Comet Hale-Bopp. Since the comet was low

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The Great Globular in Hercules, M13. In Pat Rochford's 24", the cluster was even more beautiful visually than it is in this photograph!

in the sky, being just above the 'spout' of the Sagittarius 'teapot', I was somewhat skeptical of my ability to see the 11th magnitude comet in my C8. The brightness of Hale-Bopp in Montgomery club member Russell Whigham's C11, though, encouraged me to make a serious search for this already famous comet. In what seemed like no time at all, I had this object centered in a low power field (aided by a finder chart for the comet produced by *Deep Space 5*). While the comet was basically just a 'faint fuzzy', it was easily visible with direct vision, and even showed hints of a stellar appearing nucleus. Anyway, I was really *thrilled* to get my first look at what *could* be the 20th century's 'Great Comet'!

Wayne, Tony, Ginny Dorothy and I spent the rest of the evening looking at a variety of wonderful deep sky objects. Perhaps my most memorable sight on Thursday night was the Swan (Omega) Nebula, M17. While I've seen this magnificent cloud of gas many times before, this was one of the most impressive views I've had of it in a long time. The skies weren't great, but the contrast between this nebula and the sky background just seemed to be much better than it usually is. The neck of the Swan, and especially the section where it joins the body, were as prominent as I've ever seen them in an 8 inch telescope! While the clouds which anticipated the approach of the coming cold front brought an end to the night's observing, I think we were all ready for a little rest in preparation for a Friday night which, according to the weather reports we were getting on the field, would be cold and very CLEAR!

Friday was spent touring the field looking at telescopes and equipment, and becoming reacquainted with fellow Southeastern observers we hadn't seen since the last

DSRSG. In addition, Stargaze organizer Barry Simon, had scheduled a couple of talks for this Stargaze, one on Friday and one on Saturday. We very much enjoyed Friday's talk by Ponchatrain Astronomical Society member Arlo Niederer, who spoke on his adventures as an observer down-under during a recent temporary job posting to Melbourne, Australia. One new feature of this year's DSRSG was a deep sky 'challenge'. Stargaze organizers had prepared two lists of 36 objects, one for telescopes of 8" aperture and below, and one for larger telescopes. Observing 30 of these deep sky wonders would earn attendees a nice certificate. So, I spent the remainder of the afternoon with list in hand going through *Sky Atlas 2000*, trying to acquaint myself with the location of these objects. Late Friday afternoon also brought the arrival of MAS members Judy Anderson, George Byron, Sherri Martin and Raymond Sells.

As the sun began to set, it was obvious that it was going to be a spectacular night! The darkening sky had taken on the purple hue which seems to herald superior transparency! For me, however, this was not to be a night spent in quiet, leisurely contemplation of the sky. I had a list of objects to track down! Barry had arranged the objects in order of right ascension, starting in Sagittarius and Ophiuchus. These objects were already getting low as the sun set, meaning there was no time to waste. After a couple of agonizing minutes when I just couldn't seem to find anything, the sky darkened enough for me to really begin my hunt! Soon I was picking out little 10th and 11th magnitude globulars and dim planetaries which I probably would never have thought to observe otherwise!

As the night wore, on I

continued to work the list, and in the process came across a couple of objects which I'd been meaning to hunt-up for a while. Foremost among these was NGC 6543, The Cat's Eye Nebula, a planetary in Draco. I had seen a spectacular Hubble photo of this little nebula (which also formed the cover of a recent issue of *Sky and Telescope*) and had resolved to look it up. In my C8, the non-stellar character of this object was immediately apparent; even at relatively low power. At higher power the Cat's Eye sported a bright blue color, and a somewhat elongated shape. Faint details just on the edge of perception were also noted. I resolved then and there to revisit the Cat's Eye with my 12.5" Newtonian some day. By the time I finally called it a night at around 2:00am, I had logged about 20 objects. Fellow observer Wayne Hester had also found quite a few of the objects on the 'larger scopes' list. The hunt had taken its toll on me, though, and by the time Orion rose, I was ready to relax (and get out of the cold—the passage of the front brought *temperatures in the upper 30s to McComb!*). Incidentally, while dew was *very* heavy on this night my new Kendrick Dew Remover System kept all of my optical surfaces absolutely bone dry. I heartily recommend the Kendrick System to all!

Saturday, the last day of DSRSG 13, dawned to more beautiful weather. I spent the day thinking about my observing of the night before, and wondering whether I wanted to complete THE LIST or not. While I hadn't had that much trouble finding the objects, the frenetic pace which this kind of an activity requires is really alien to the kind of observing I like to do. Before long it was time for our afternoon meal in the park cafeteria. With the arrival of Leland Cox, our MAS group was almost complete, and we enjoyed a leisurely lunch break. By

the way, in my opinion, the quality and quantity of the Stargaze food had improved this year (though it still isn't four star level!). Shortly after lunch, our final MAS member, Pat Rochford, arrived, bringing with him his beautiful new 24" DOBSONIAN!

The Stargaze's final speaker, Dr. Gregory Seab of the University of New Orleans was scheduled for 1:00pm. I had elected to help Pat assemble his new telescope (or at least lend moral support) so I missed this talk on 'The Colors of the Night.' Dorothy reports that the lecture was, all-in-all, rather interesting. Before long, Pat's new f4 24" was assembled and standing on the field. Though he had done all of the assembly and finishing himself, Pat's new baby looked at least as good as the new 25" Obsession across from us (this Stargaze featured probably the largest assortment of BIG scopes ever, a 25", a 24" and a 22"--AWESOME!). The final activity before the night's observing began was the yearly raffle. Unfortunately, the MAS gang didn't make out as well on prizes as we usually do. Wayne Hester did, however, at least win a couple of nice mugs emblazoned with photos of deep sky objects.

Darkness was finally in the offing, and I had made a decision. I had enjoyed the observing contest at first (it was nice to prove to myself that I could still locate just about anything my scope is capable of showing), but spending the night jumping from object to object was just not to my taste (though I certainly admire the perseverance of the observers who finished their lists). No, I felt that I'd be much happier doing what I usually do: admiring and contemplating the deep sky marvels my scope shows me, and sharing my 'discoveries' and my wonder with my wife and good friends!

I was also looking forward to doing some observing with Pat

Rochford's monstrous (but easily manageable) new scope. After ironing out a couple of minor glitches--this was first light for the 24"--Pat had the scope aimed at M13, and was exclaiming in wonder that I needed to get up the ladder and take a look! Scrambling up to the eyepiece, I was rewarded with a view of M13 the likes of which I'd seen before only in photos. We sometimes boast, when observing globular clusters, that our scopes have resolved one of these huge balls of stars 'to the core.' With the 24", *this was no boast*. I saw stars right to the center of this giant cluster! The image had an overall 3D appearance to it which made it hard for me to pull my eye away. But I knew others wanted to view with the 24", and I also wanted to get some observing done with my 8", so I reluctantly got off the ladder. Later in the evening, I had a view of the Bridal Veil Nebula in Cygnus in the 24" that was also amazing. Simply put, the view of this nebula's tenuous filaments *looked just like a black and white photograph!*

Back at my own scope, I resumed my usual leisurely pace. Even going slowly though, I observed many, many beautiful objects during the *long clear night*. Perhaps my most memorable view, though, came in the quiet stillness after midnight, when many observers had turned-in. Alone with my beloved scope, I sought-out the lackluster constellation, Sculptor, which was finally riding high. This constellation *is* very subdued, but it holds a treasure, the beautiful galaxy NGC 253. On this night, the galaxy was bright and oh-so-pretty, displaying such a wealth of detail that I had to question whether M31 really is the most lovely of these distant 'island universes'! The image in my Ultima C8 was so striking that Pat and I soon had the 24" pointed at the galaxy. I really can't even *begin* to describe the

spectacular appearance of this object in a big scope.

All too soon, it was Sunday morning. Time to pack and say goodbye to Percy Quin and our many observing comrades for another year. The nicest part of this year's Stargaze was that I was able to store up enough wonderful deep sky memories to see me through the next 12 months (or maybe at least the 6 months until Mid-South....)!★

--Rod

From City Lights to Deep Space

Another wonderful Winter observing season is upon us! While I'm looking forward to upcoming stargazes and other trips to



dark observing sites, I'm *almost* as excited about just getting out in the ol' back yard with one of my trusty telescopes. Even in our (*much*) less than pristine skies, there's just so much to see; especially in the winter Milky Way! I've been writing this column for a while now, and, frankly, I'm surprised every time I sit down to begin a new 'City Lights', that I haven't run out of good objects. Especially given the original charter of the column: '.... a survey of deep sky objects visible from the light-polluted city which can be rewardingly viewed in small scopes (the baseline being a 4-6" reflector)'. But a little persistence combined with a good star atlas (and some *killer* computer

programs) keeps my celestial tour bus on the road. In fact, my usual problem is that, by the end of an observing season, I've missed many objects which I promised myself I'd scout-out *this* year! With this in mind, let's visit with a Celestial Hero, Perseus, before he slips beneath the horizon and the galaxies of Spring return.

After observing for a few years, most deep sky fanatics tend to focus on a single type of deep sky object (in my case, globulars)—often to the exclusion of all else. For example, no self-respecting galaxy fancier would be caught *dead* wasting her time on *mere* open clusters. But this type of narrow concentration means you miss some wondrous views. Some of my most memorable observing runs have been those where I've viewed a wide variety of objects. Maybe it's the contrast between very different denizens of the deep sky zoo which makes these nights so interesting. So, I decided to select several *radically* different destinations for tonight's tour. For a goal of this type, Perseus seemed to be a natural hunting ground. This is one constellation that has it *all*: star clusters, elusive diffuse nebulae, planetary nebulae, beautiful and mysterious double and variable stars, and even a galaxy or two! I eventually selected three very different, very, very beautiful objects for tonight's run: open cluster M34, planetary nebula M76, and galaxy NGC 1023.

M76 (NGC 650-651), R.A. 1h42m18s, DEC 51°33'57", MAG 11.0 PLANETARY NEBULA, VORONTSOV-VELYAMINOV TYPE 3(6), SIZE=3'43" x 2'47".

M34 (NGC 1039), R.A. 2h41m59s, DEC 42°46'55", MAG 5.2 OPEN CLUSTER, TRUMPLER TYPE II 3 m, SIZE=35' x 35'.

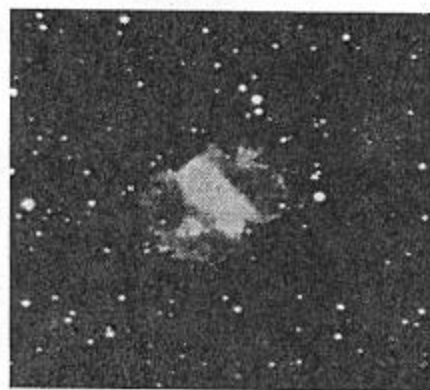
NGC 1023 (UGC 2154, ARP 135), R.A. 2h40m30s, DEC 39°2'58", MAG 11.0 GALAXY, HUBBLE CLASS E7p, SIZE=9' x 4'.

Our first stop, M76, The Little Dumbbell in Perseus, is not really *that* hard to find, though it is, at magnitude 11, one of the very dimmest of the Messiers. At about 3' x 2' in size, its surface brightness is still *fairly* high. Referring to your star atlas, or to the chart included in this month's issue of *Skywatch*, look for this little marvel slightly less than a degree northwest of ϕ Persei. If you have difficulty finding this object, stop for a moment, get your bearings, take a deep breath, and try again. Remember to check each field carefully since this planetary may be a bit hard to see in a small scope under really poor conditions.

Once you have M76 centered, you may *or may not* be able to make out the 'dumbbell shape'. Last year, under the dark skies of McComb Mississippi, I had an absolutely breathtaking view of this planetary in my 12.5" f4.8 Newtonian. The dumbbell shape was very obvious, with one lobe being noticeably brighter than the other. In fact, at high magnification (about 200x), this object seemed to *easily* rival the 'big' dumbbell in Vulpecula! Back home, though, amidst the streetlights of downtown Mobile, M76 was quite a bit less spectacular when viewed with the 4.25" f11 Newtonian. But I still felt that it was *more* than worthwhile; it even showed some hint of its shape in this tiny scope under these horrible skies! In my notes from one chilly November night (which I noted was well above average in both seeing and transparency), I wrote that M76 Interesting, but really just at the limit of visibility in this aperture under these skies. Slightly elongated, diffuse'.

M76 is a Vorontsov-Velyaminov type 3(6) planetary nebula

(irregular disk/anomalous form) which is located about 1700-3000 light years from Earth (like most planetary nebulae, M76's distance is not well known). Photographs taken of M76 by very large telescopes show that in addition to its curious non-disc structure, M76 is wreathed in many faint streamers and tendrils of nebulosity (in one plate, shot with the Hale reflector, M76 looks a little like the Crab supernova remnant, M1!).



M76 shows many fascinating features in a very large scope! *Palomar Observatory Sky Survey*

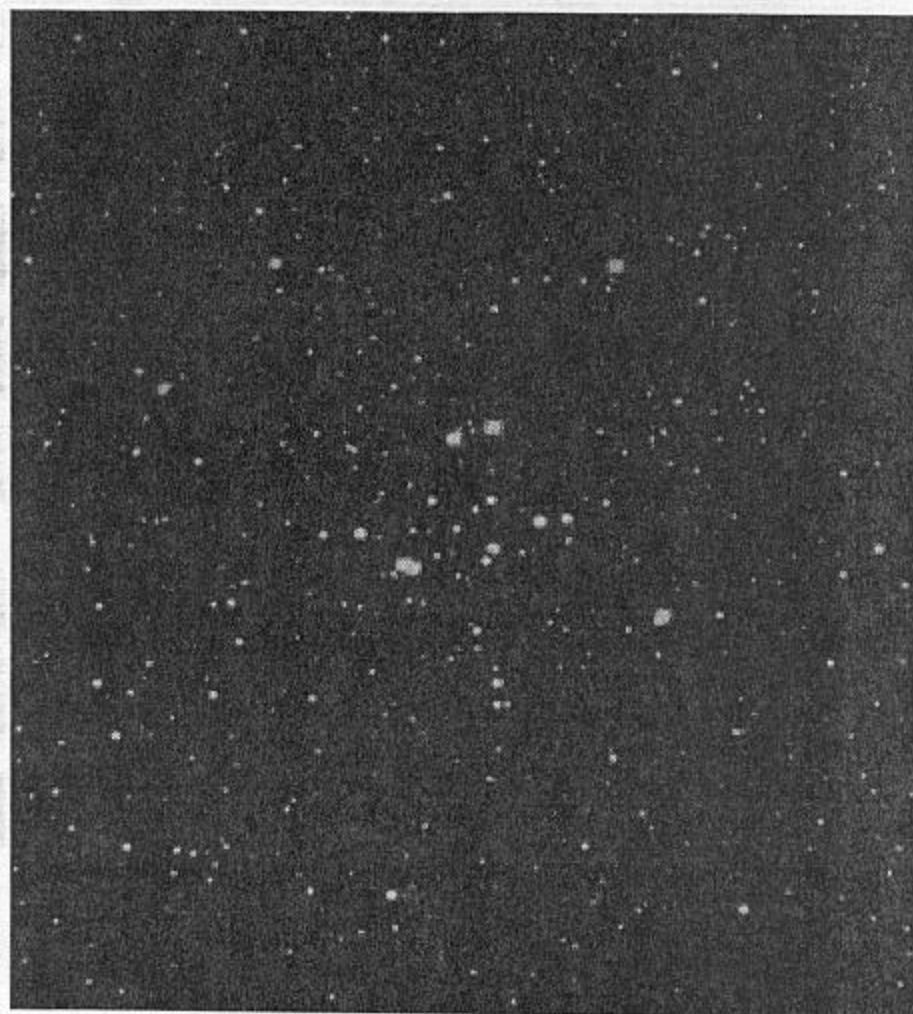
Wow! The little Dumbbell was a bit hard to find in these sodium orange skies! But our next stop, M34, is a lot easier! After M76 you should almost be able to find M34 with your eyes closed! Again using a good chart, search for this cluster 5° North-Northwest of Algol (β Persei). On even fairly poor nights, this magnitude 5.2 open cluster should be readily visible in your finder (under really dark skies, M34 is obvious with the naked eye). At 35' across, this cluster just fills the field of a low power eyepiece, so stick with your longest focal length ocular for the most pleasing views (though you may want to try higher power to see if you can pick up some of the cluster's mag 13 stars).

I enjoyed viewing M34, though I must agree with the late Walter Scott Houston who found the cluster 'sparse'. Looking through my log, I find

that on the same night I viewed M76, I also took a look at M34 with the 4": *'Easily seen, fills a .5° field. M34 isn't super-spectacular, but is easily seen, found, and is rather attractive. Concentrated toward the center. No nebulosity seen. About 40 stars easily visible at 45x.'*

Under the Trumpler classification scheme for open clusters, M34 is class II 3 m (detached with weak concentration towards center, large range in brightness, moderately rich). At a distance of about 1500 light years, M34 is approximately 20 light years across. This group's age of 100 million years or so makes it somewhat elderly as open clusters go, being senior to both the nearby Double Cluster and the Pleiades.

Our final deep sky tourist attraction for this issue's expedition, NGC 1023, seems out of place here in the environs of the Winter Milky way, but some galaxies do manage to make their presence known not far from the 'zone of avoidance' created by our galaxy. NGC 1023 isn't overly hard to locate (though you *should* try to wait for a good night if your scope is small



Like many open clusters, M34 is really more attractive visually than it is in photographs!



NGC 1023 is a very beautiful object, both visually from dark locations and in long exposure photos, as in this plate! *Palomar Observatory Sky Survey*

and/or your skies are really bad), and it is rather spectacular—as little NGC galaxies go, anyway. I recall that the first time I hunted-down this galaxy from the light polluted skies of the city, I surprised myself by finding this 11th magnitude marvel in no time at all! Maybe because the reasonably bright stars 12 and 16 Persei (magnitudes 4.9 and 4.2, respectively) form a little triangle with NGC 1023, making it easy to pin down.

I did have to pay attention to what I was doing, though, since under my highly light-polluted skies all I could really see of the galaxy was its small, elongated core (even this 'bright' core was best seen with averted vision). On a decidedly average night of seeing, my

notes have it that NGC 1023 was *'easily visible, especially with averted vision. Seems elongated e/w. No sign of a stellar core or outer envelope.'*

NGC 1023, a Hubble E7p galaxy, is a lenticular galaxy with a disturbed-seeming nucleus (thus its inclusion in the Arp catalog). This part of the constellation contains quite a few dim little galaxies, a number of which lie just east of NGC 1023.

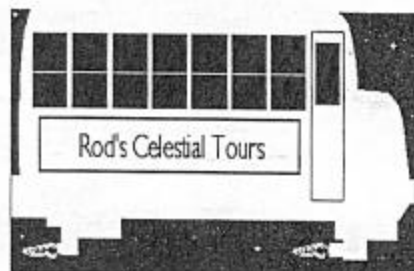
Feeling a bit of a strain from locating and viewing *another* faint fuzzy, I pull my eye away from the scope, and for a moment just look up at the skies. Overhead, the distant, alien stars of the Perseus OB-3 association blaze away. Finally, my gaze settles on the spot where I know that galaxy NGC 1023 is located. Though I can't *hope* to see this dim and distant creature of the night with my unaided eyes, I can indeed see it with my *mind's* eye. And suddenly, with a rush of something that almost feels like vertigo, I sense the *true three-dimensional reality of the cosmos*. The stars of OB-3 are my close neighbors, nearby friends, no more alien than my Earthly acquaintances when compared to the *really* distant and peculiar NGC 1023. We are all of us--the residents of the Milky Way--clustered together for comfort against this immense darkness. And even NGC 1023 is *so close* when we consider the inhuman distance which lies between us and the *truly strange and alien* QUASARS. Sometimes one of the most rewarding tools of the amateur astronomer is *imagination*. Our little telescopes give a (sometimes) dim outline of the truth of things, but our minds can help fill-in the details of the realities of our universe. ★

--Rod

Book of the Month: Close, Frank, *Apocalypse When?*. William Morrow and Company, Inc., New York, NY.

1988. \$17.95. ISBN: 0-688-08413-3.

If you are the least bit *curious* about killer asteroids, rogue comets, an unstable Sun, and the decay of the proton, this book is for you! Dr. Close's book has been around for a while, so you can often find it heavily discounted at local book stores. The Mobile Public Library also had a copy at



one time. Definitely recommended!

Next Time: More voyages with your wonderful telescope!

Zen and the Art of Telescope Collimation

Well....no, not really. Collimation isn't exactly an *art*...it's blood, sweat and tears. At least that's what some amateurs seem to think--given the poor alignment of many of the telescopes I look through (sometimes even those owned by 'advanced' amateurs). If you want good images, though; especially of planets and double stars, collimation is critical. If you have a fast focal length Newtonian (<f6), collimation is *doubly* important for good performance. You SCT and refractor owners aren't going to be left out of this pleasant little game either--your scope's optical train may also

eventually require adjustment. But the up side is that telescope collimation is easy after just a little practice. It is neither an arcane art nor a grueling torture. And the rewards of a well-aligned telescope are readily VISIBLE.

Let's dispense with SCTs and refractors first. My collimation instructions for these scopes are brief: READ YOUR MANUAL AND FOLLOW ITS RECOMMENDATIONS ON COLLIMATION TO THE LETTER. I don't want to be the cause of an SCT secondary dropping onto the primary mirror or an exquisite fluorite objective hitting the ground. With refractors especially, methods of collimation vary (some objective cells don't even have a means for user adjustment). Refractors frankly don't need adjustment often anyway (though it *does* happen). SCTs are perhaps a bit more prone to requiring optical alignment than refractors, but most still shouldn't need to be collimated very frequently. An SCT which was properly aligned at the factory will sometimes go years before any readjustments are necessary. If needed, collimation of these telescopes is fairly easy, since the only *user adjustable* element is the secondary.

Now to the heart of the matter. *If you own a Newtonian reflector, it's going to require collimation*. Many short-focal-length medium-to-large sized Dobs really

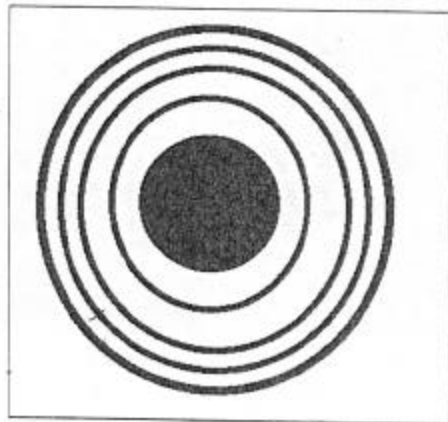


Figure 1

need to have their alignment checked *before every use!* Does your telescope's optical alignment need to

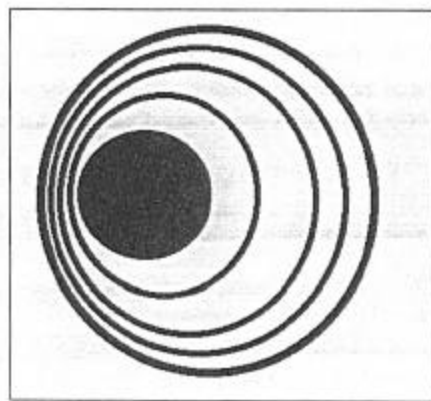


Figure 2

be adjusted? Well, it's easy to tell whether a scope is out of collimation by even a small amount: the next time you're outside with your beloved telescope, place a bright star in the field, pop in a high-power eyepiece, and defocus slightly until you can see diffraction rings (seeing needs to be

reasonably steady, natch). If the diffraction rings are all concentric--if everything is centered--all is well (see figure 1). If, however, things are a bit lopsided, (as in figure 2) you've got big problems in River City (collimation-wise anyway). Once you've equipped yourself with a few collimation tools, you can also check your scope's alignment inside during the daytime, but this 'star test' is really quite easy and sensitive.

Ok. So your scope's out of collimation according to this test (you may have also noticed that images just don't seem to have much 'snap' lately). What to do? Well, let's get ready to collimate the beast. The first thing I'm going to ask you to do may seem a bit harrowing: I want you to put a mark in the exact center of your beautiful primary mirror! But don't worry! The center of your mirror lies in the shadow of your secondary (diagonal mirror) so you aren't losing anything.

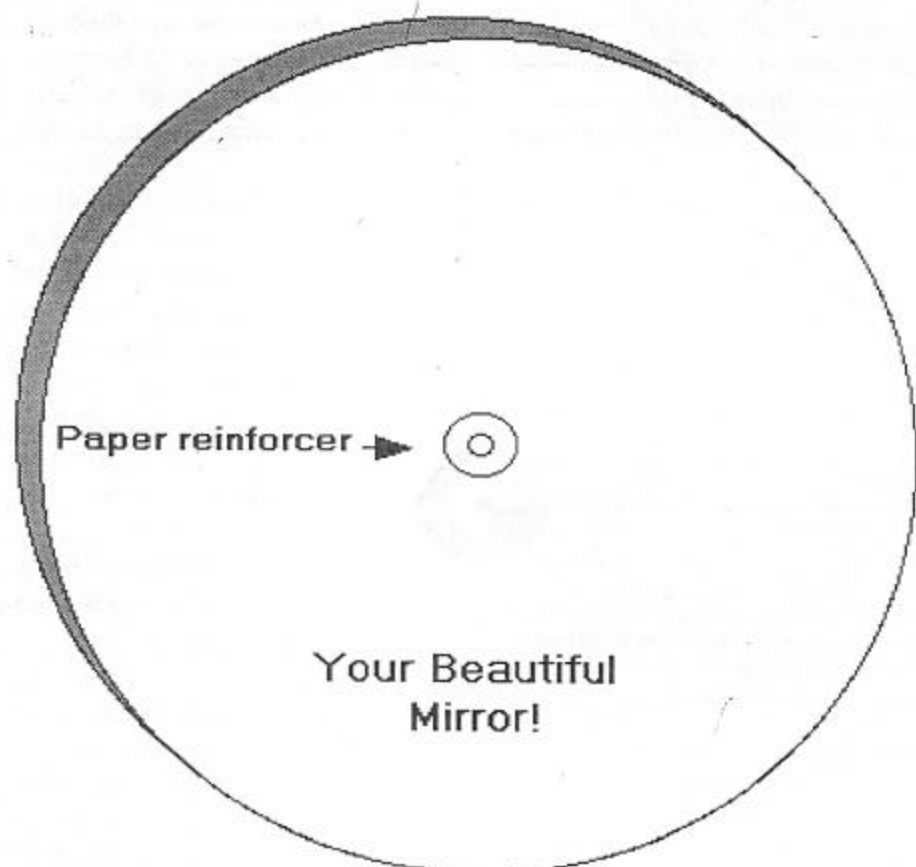


Figure 3

Marking the center of the mirror will allow you to easily bring your scope into exact collimation. Here's how to mark the mirror:

1. First, find a sheet of tissue-like paper. I've used tissue-type wrapping paper in the past. You want something which isn't likely to scratch your mirror.
2. With care, use a compass to draw a circle the exact same diameter as your mirror.
3. Cut out the circle and carefully place it on your mirror so that the two are perfectly aligned. Your compass should have made a hole in the center of the circle when you drew it. This small hole now marks the exact center of your mirror.
4. Using a magic marker, carefully use this hole as a guide and place a small mark on your mirror (it may be necessary to enlarge the hole a bit in order to make a good mark--just be sure you get the paper circle and the mirror perfectly aligned again before you mark the mirror). Remove the tissue paper. You will now have a small black dot in the center of your mirror.
5. Now, stick a notebook paper hole reinforcer onto your mirror so that the small black dot is in its center. What you wind up with is the round 'o' of the hole reinforcer in the exact center of your mirror see (figure 3).

Now that you have a good marker to

focuser tube

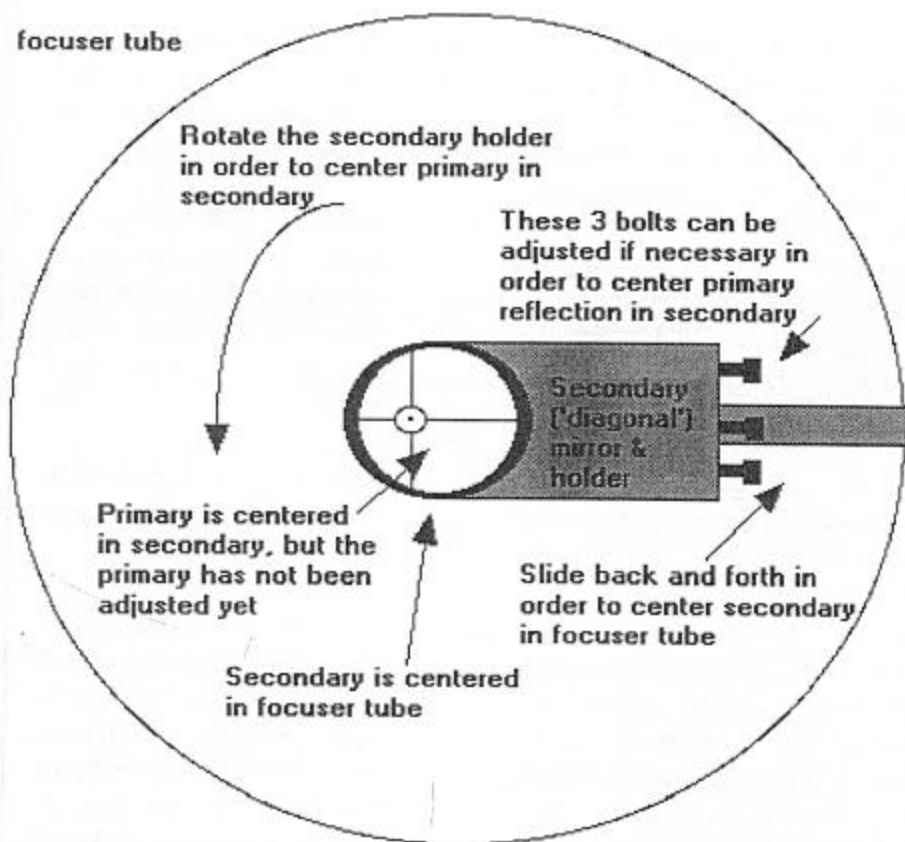


Figure 4

indicate the center of your mirror, you'll be surprised how easy adjustments become.

The first step of the actual collimation procedure is to ensure that the secondary mirror is centered with respect to the focuser tube and that it is not rotated or tilted. Some people suggest the use of a sight tube, which is essentially a 1.25" diameter tube with a cross hair at one end and a peep-hole at the other. Looking through this supposedly helps you align the secondary. And it probably does. I've never felt the need for one of these devices, though, since it seems fairly easy to judge the position of the secondary by eye (being careful to keep my eye centered on the racked-in focuser). But if you'd like a sight tube (and it might not be a bad idea) they are readily available from companies that sell collimation tools (Tectron, for example), or they can be easily made using a small piece of 1.25" o.d. tubing.

In order to check the alignment of your secondary, reference figure 4. First, the secondary should be centered in the eyepiece tube. If this is not the case, the secondary

holder needs to be adjusted 'forward or back'. With a 'spider' type diagonal, a nut (or nuts) on the 'stalk' of the mirror holder can be loosened and the mirror can be moved back and forth until it is centered. With a 'single stalk' diagonal holder, which is attached to your focuser with a metal rod, loosen the set screw on the focuser which retains the metal rod, and move the entire assembly *in and out* until centered in the primary. Some secondary holders, such as those on Coulter's Dobsonians, don't move on either of these axes and shouldn't require adjustment.

Next, ensure that the primary mirror is centered in the secondary (don't worry about the position of the paper reinforcer at this point). If the secondary appears to be 'rotated', this can be cured by rotating this mirror back into the proper position by re-loosening the screw or nut you loosened in order to center the secondary in the previous step (see figure 4). Some spider type diagonal holders have 3 screws which allow you to further adjust for mirror tilt. Usually, these screws won't have to be

touched, but they can be adjusted to center the reflection of the primary mirror in the diagonal if necessary. With a single stalk diagonal, further adjustments can only be achieved by bending the metal rod as needed (be careful).

In order to finish the collimation of your scope you will require one further tool: a 'Cheshire'

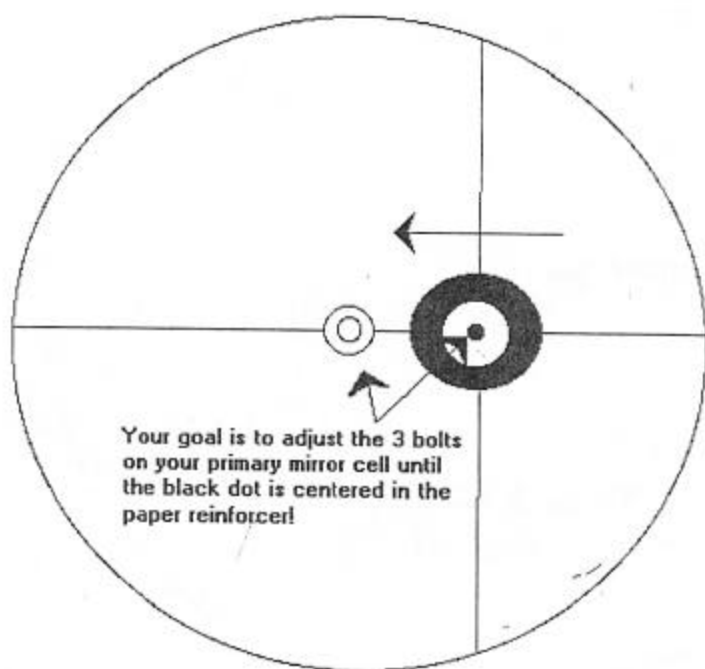


Figure 5

eyepiece. This can be simple and cheap and homemade, or expensive and finely machined, but what it is is an eyepiece-sized barrel with a pinhole opening in the closed end to look through. The aforementioned expensive versions have an additional hole in the side of the tube to allow light to illuminate a mirrored surface, which makes for easier adjustments. Cheaper versions, of the Cheshire, which can often be found for sale for a few dollars at stargaze swap tables, don't have a hole in the side of the tube--they merely have a circle of reflective tape on the inside of the closed end of the eyepiece, which serves to reflect ambient light, giving you a white background to sight on. The cheapest version of the Cheshire costs nothing. It consists of a 35mm film canister with a small hole drilled or punched in the exact center of the closed end. If you wish, paint the inside of the closed end white in order to facilitate sighting. That's all there is to it.

We're now ready for the final procedure. Insert the Cheshire into your eyepiece holder, and sight through the small hole (aim your scope at a light source first--other than the Sun, of course). You should see the reflection of a bright circle with a central dark dot (your peep hole) in your primary mirror. Now adjust the three knobs, screw heads, or allen head screws on your primary mirror cell--which control the positioning of your primary--in order to center the small black dot in the exact center of the paper reinforcer we pasted on your mirror (see figure 5). It'll take a little practice to gain some sense of which of the three screws on the primary you need to turn in order to move the black dot in the correct direction, but you'll soon get the knack. Just take things slowly, and work methodically.

Your telescope should now be

well aligned, but you'll probably want to do the star test again to make sure things check out. All diffraction rings should now be concentric. It is possible to touch up collimation in the field while viewing a star's diffraction rings, but go slowly, moving each adjustment screw on your primary cell by small amounts, or you may get so out of collimation that it's hard to cure things outside in the dark, and you miss out on a nice night of viewing! Now go and enjoy a well-aligned scope. If your collimation was off by much, you may be surprised at the improvement. It can be almost like having a new scope! If any of the foregoing isn't clear enough, or if you just have further questions, please don't hesitate to contact me. Believe me, I still remember how *hard* it seemed to collimate my first scope, a 3" Tasco Newtonian, that first time. By the way, if you know of any good 'tricks' to facilitate collimation, or have any favorite gadgets or devices (laser collimators, etc.), I'd sure like to hear from you!★

--Rod



Astrobytes

The World Wide Web

I know that I promised a review of the new version of Distant Suns, First Light, but I'm still evaluating this new

CD astronomy program, and I'm still waiting for a few questions I have about its operation to be answered by the author. I hope to have a review ready by the next issue of Skywatch. In the meantime, here's a list of some of my favorite World Wide Web sites.

In my opinion one of the greatest advances in astronomical computing has been the emergence and evolution of the INTERNET's World Wide Web (WWW). The image-laden hypertext documents of the web, seem very well suited for astronomical information. It's all available on the Web: the latest astronomy news, images of all kinds, astronomy software, even an online version of the Palomar Observatory Sky Survey! These ten Web sites are my current favorites (though I could easily have made this a 'top 50' list). I've included the URL (Uniform Resource Locator) for each site, so start-up Netscape (or Mosaic) and enjoy!

1. *Sky and Telescope*. S&T's web site is where I usually go first for information. In addition to the weekly news bulletin (I used to have to make a long distance call to get this news from a recording), the *Sky and Scope* Web page includes links to other sites, a new page devoted to comets, equipment reviews and more. The only criticism I have is that many of the links to equipment and accessory reviews are not yet active.
U R L :
<http://www.skypub.com>

2. *NASA Spacelink*. I've always liked this service--even when I had to pay long distance charges to connect to the BBS

version. Especially valuable for satellite observers, since this site always has the latest NORAD elements for the most popular birds. URL: <http://spacelink.msfc.nasa.gov/>

3. *The Digitized Sky Survey.*



After using this site for a couple of months, I'm *still* chirping about it! What this is is the famous Palomar Observatory Sky Survey (POSS) digitized, put on CD ROMs and made available on the Web. It wasn't long ago that I was considering purchasing the microfiche version of this incredible atlas (for *quite* a few \$). The plates of this National Geographic sponsored survey of the northern skies (with the 48" Schmidt Camera) were digitized during the



Telescope Science Institute has taken the wonderful step of putting these CDs online for the entire astronomical community to use. And using this remarkable tool is easy. You specify the object you're interested in and the size of the plate area you'd like (with 60' x 60' being the largest possible section), and your selection is rapidly downloaded to you in either GIF or FITS format. The only drawback, of course, is that large pictures take quite a while to download via modem. Fantastic! URL: <http://stdatau.stsci.edu/dss/>

4. *Saturn Ring Plane Crossing of 1995-1996.* Much excellent information concerning the current crossing of Saturn's ring plane. Also a lot of good material and good images on Saturn in general. Brought to you by the folks at JPL. URL: <http://newproducts.jpl.nasa.gov/saturn>

5. *sci.astro.amateur* This isn't really a Web page--it's a Newsgroup. But since the Newsgroups are accessible with Netscape, I couldn't resist putting it on this list. This is really your best source of information (and admittedly rumors and hearsay) concerning amateur astronomy. Period.

6. *Astronet.* The original reason for this site's existence was to provide a home for *Astronet Digest*, an online 'magazine' which, for the most part, consists of a 'best of' of the postings in *sci.astro.amateur*. But lately this site has expanded, and contains quite a few items of interest. One of the best features here is

'Hot Links', a *long* list of clickable links to other astronomy sites. URL: <http://www.rahul.net/resource/>

7. *SEDS.* The Web page of the Students for the Exploration and Development of Space, sponsored by the University of Arizona's Lunar and Planetary Laboratory. This site has probably the best and most extensive collection of images and astronomy software on the Web. URL: <http://www.seds.org>

8. *Astronomy Magazine.* *Astronomy Magazine* now has a Web site up (somehow, I didn't think it would take them long once *Sky and Telescope* went online with their site!). Quite a few items of interest here. My only objection is the occasional dumbing down of astronomy that I see here (and also sometimes see in their print magazine). For example, the link which is titled 'Best Overall Source of Information on Comet Hale Bopp' leads you to a home page entitled 'Comet Hale-Bopp for the Non-Astronomer!'. But this generally excellent new site shows all the signs of becoming one of my most visited URLs (after a few of the rough edges are smoothed out). URL: <http://www.kalmbach.com/astro/astronomy.html>

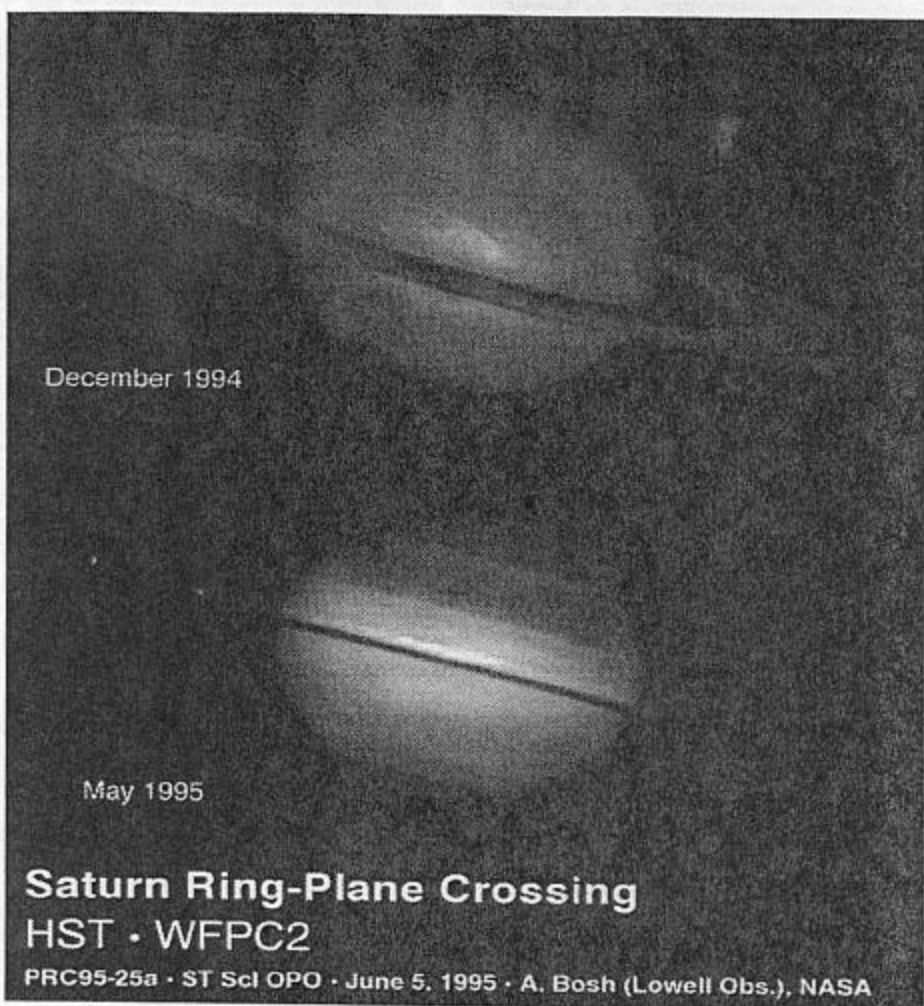
9. *Astronomy Now.* Number 3 of the 'Big 3' English-language astronomy magazines, *Astronomy Now*, also has a

site up. So far not a lot really here, but worth a visit for 'Web Site of the Month'.
U R L :
<http://www.demon.co.uk/astronow/>

10. *Bill Kelly's GIF Farm.* This site is sponsored by the University of Alabama Department of Physics and Astronomy. Quite a few impressive images available for download. They just need more of them! URL: <http://crux.astr.ua.edu/astroHome.html>★

Ring Plane Crossing

Saturn just isn't very interesting to observe. There, I've said it. Heresy? Well, I didn't say it wasn't *beautiful*! But let's face it, most of the time there just isn't much to see on Saturn. A quick look at the rings, maybe just to judge the night's seeing, and that's it. While a moderate to large sized telescope will usually show *some* detail on the disk of the planet, it is subtle. The interfering rings simply make our view of the planet's atmosphere (its cloud bands are faint anyway, being dimmed by a layer of hydrocarbon 'smog') VERY drab except on those rare occasions when there is a major outbreak in the atmosphere (as a few years ago when there was an appearance of a 'great white spot'). Unfortunately, these major stirrings in Saturn's atmosphere seem to happen only about every 30 years or so; they apparently coincide with Saturn's perihelion. But every once in a while, the situation changes and the planet becomes a magnet for observers. This may be a brief event,



Saturn Ring-Plane Crossing HST · WFPC2

PRC95-25a · ST ScI OPO · June 5, 1995 · A. Bosh (Lowell Obs.), NASA

such as the occultation of a star by the planet's rings or it may be a longer show, like the current series of ring plane crossings which have certainly drawn me back to the planet!

As Saturn orbits the Sun, the angle of its rings relative to our star changes by 27.3 degrees. Twice during the planet's 29.5 year orbit, the rings appear edge-on as viewed from the Sun. Since the Earth is only 6 degrees from the Sun as viewed from Saturn, it crosses the ring plane at about the same time. Thus, we see the rings 'edge-on' from Earth about every 15 years. Due to the geometry involved, we may see the rings edge-on either one or three times. Our current ring plane passage involves three crossings. There will not be another 'three-time' ring plane crossing until the year 2038!

The dates of the crossings are (or were, since only one remains) as follows:

May 22, 1995	0518 UTC
Aug 10, 1995	2054 UTC
Feb 11, 1996	2334 UTC

In addition, in November observers will have the unique opportunity to see the unlit 'dark side' of Saturn rings:

Nov 19, 1995	1509 UTC	(Sun crossing)
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But *why* are astronomers, both amateurs and professionals, so excited about these opportunities to view a ringless Saturn? Well, the absence of Saturn's glowing rings provides the best chance for

Earthbound observers to view both the disk and satellite system of the planet clearly. 13 of Saturn's 18 confirmed moons have, in fact, been discovered during ring plane crossings. At this time our edge-on view of the Saturn's satellite system also allows us to observe many unique events--occultations and eclipses--which cannot be viewed from Earth at any other time (the 'plane' of Saturn's satellite system is almost the same as that of the rings). Finally, the absence to the rings' glare gives observers an opportunity to see the subtle features of Saturn's atmosphere. So far during this apparition, the Hubble Space Telescope has discovered at least two and maybe as many as four new satellites, while a team at Lick Observatory had seen two small white spots on the planet's disk which would *undoubtedly* have been invisible during the rings' glory days.

I was really looking forward to this series of ring crossings; not only because I knew that I'd have a unique view of Saturn, but also for nostalgic reasons. The first *really good* views of Saturn I ever had were with my 4" f11 reflector (which I still use) during the 1966 event. I had struggled to view the planet for a year or two before this with my 3" Tasco telescope, but it was just not able (because of spherical aberration) to do much with Saturn. After bugging my Dad unmercifully, I finally received the scope of my dreams, a 4" Edmund Scientific 'Palomar Junior'. Actually, this was the telescope of my *realistic* dreams, my *real* dream scope was an 8" Edmund 'Space Conqueror', but this was far beyond our means. I was a little disappointed to get my new scope when Saturn's rings were 'gone', but the image was so sharp, clear and downright beautiful, that memories of these nights have remained with me for almost 30 years.

With this fond, lingering memory in mind I set up my 12.5" Newtonian in my quiet back yard. A 12.5" telescope, in this day and age of amateur astronomy's 'aperture explosion', is beginning to be considered a *small* or at most *medium sized* instrument. But 30 years ago, I would have hardly *believed* that I'd someday be swinging a 'scope this big toward the bright pinpoint of Saturn. I inserted a medium power eyepiece and quickly centered the planet in the finder. Putting my eye to the scope, I focused the disk of the planet into crystal clarity. I was stunned. At first it was hard to believe I was viewing Saturn. While I was observing about a month after the August ring plane crossing, the rings were still quite thin and unobtrusive. What immediately caught my attention was Saturn's retinue of little worlds. The image really reminded me of a view of Jupiter and its Galilean satellites in a 6" (or so) telescope! I could make out the 5 brightest worlds--Titan, Iapetus, Rhea, Dione, and Tethys--the more difficult Enceladus was behind the planet at the time. While a 10-12" scope will *regularly* show about six of the planet's moons, they never look as prominent as they did on this night! The brightness of the magnificent ring system tends to both subdue the satellites, and divert your attention from them. After the moons, the disk drew my attention. In addition to the razor thin line of the ring shadow crossing the equator of the planet, I could see Saturn's cloud bands more clearly than I had *ever* seen them (especially when I used a yellow filter).

I intend to continue to view this still mysterious planet at every opportunity for the rest of this apparition. What a show! Remember, there won't be another series of ring crossings like this for 43 years--until 2038 (those in 2009 and 2025 are 'single pass' ring plane crossings), so get

out with your telescope and enjoy this spectacle now!★

--Rod

My Back Pages

AstroPoem

The Telescope

This cold construction of metal and glass
Comes alive under my touch.
The creature of Galileo
Transforms to my wished-for set of wings.
And we fly into the darkness and light
Of the galaxy!
Or, spurred-on by a need older
Than the abstract,
We become One and fall into realms
even more distant!

--Rod Mollise



Club Notes

--September Monthly Meeting

The September 1995 monthly meeting of the Mobile Astronomical Society was well-attended, with over a dozen members being present. The fact that the August meeting was, in effect, canceled by inclement weather and the threat of Hurricane Erin, left us without a speaker or prepared program. So your editor took it upon himself to give a somewhat fumbling talk on the recently discovered Comet Hale-Bopp. While my presentation could *certainly* have been smoother, I hope I helped to get the word out on this potentially spectacular object.

The major topic of discussion at this meeting, though, was the club's current lack of a dark site. If you are new to the Mobile Astronomical Society, you may not remember our last Dark Site, which was located just over the Mississippi state line in Hurley. While the skies were not *perfect* (on some nights, light pollution in the east--towards Mobile--extended 30+ degrees in altitude), they were very good; in fact some of my most astounding views of Omega Centauri were from this location. In addition, the Dark Site gave members the

opportunity to get together and socialize in a more relaxed environment than a necessarily brief monthly meeting can provide. We *always* had a good time even on those nights when we were clouded-out.

There was a major problem with this site, however: the fact that we had no real claim to the land. We were simply allowed to use it by the farmer who owned it. While we never had any problems with him, and he was *always* very nice, it just didn't seem to be a very stable situation as time wore on. I for one was reluctant to go out and observe at the Dark Site alone or to stay after others had left. *Not because I felt insecure*--this location always felt perfectly safe--but because deep down I *really didn't feel that I had any right to be there*. As you well know, in Mobile it's not unusual for a couple of new moon dark observing periods in a row to be clouded-out. And this made most of us even more hesitant to head-out to Hurley. When we hadn't been out there in several months, we weren't always sure if we were still welcome (though I think that we really always were). Because of these factors, club use of the Dark Site slowly decreased, and, by the Summer of 1994, it had stopped altogether.

I for one feel that the club has lost a lot with the passing of regular dark sky observing sessions. Even those members who didn't make it out to the Dark Site on a regular basis seemed to enjoy hearing the reports of those who did. And the regular use of the site also seemed to somehow give the club a 'sense of direction'. Finally, those of us who live in the really heavily light polluted parts of the city were provided with the opportunity to do some *real* deep sky observing. These days those of us in this situation are limited to doing serious observing during organized stargazes--i.e. two or three times a year. *This just isn't enough* (for me anyway).

At the conclusion of the meeting it was decided that it's time to address the 'dark site problem'. Several possibilities were discussed, and some informal plans were made to check on a couple of locations. If you can help with this important project, please, please let your fellow club members know!

--Winter 1995 Public Stargaze at ESC

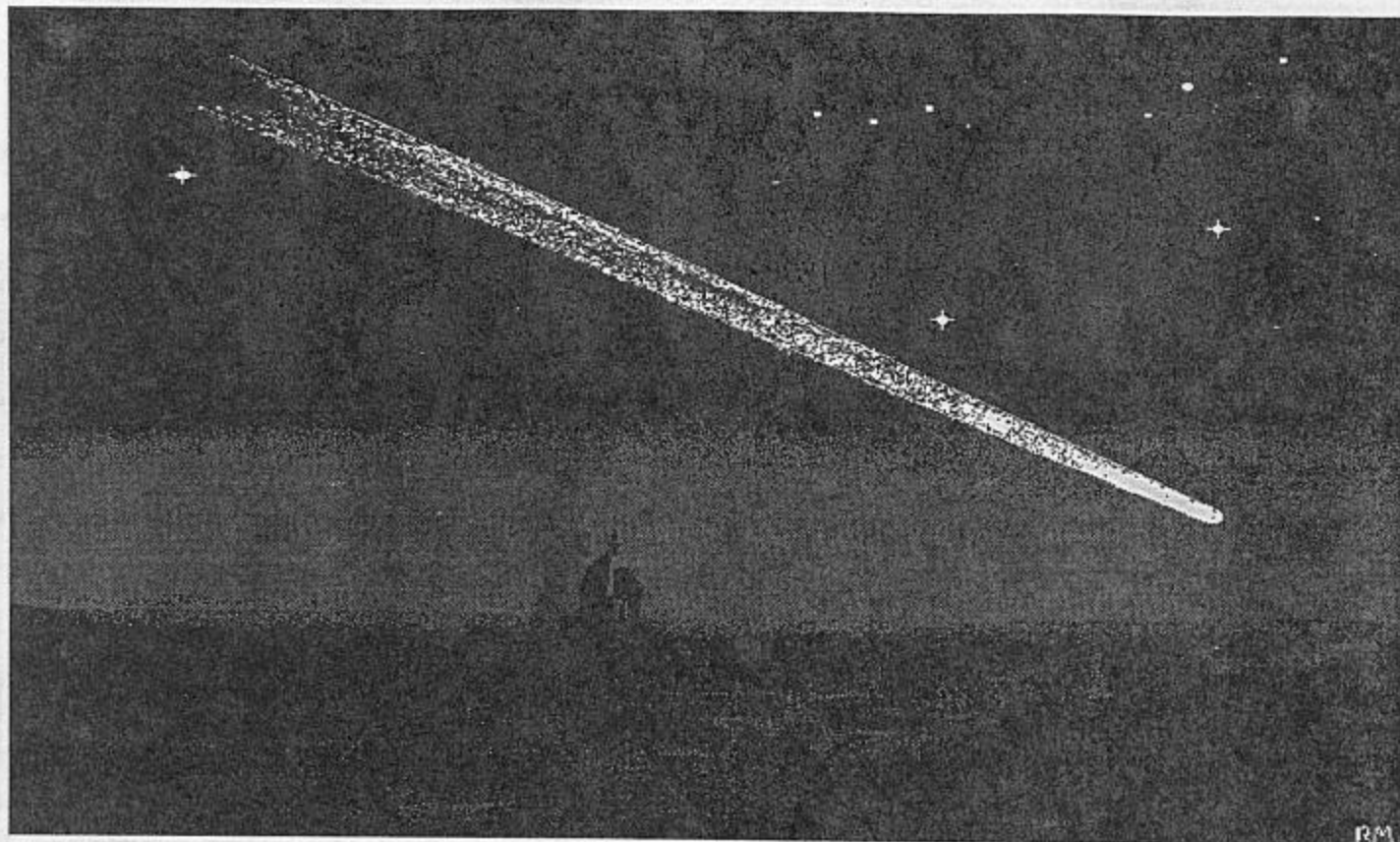
The Winter 1995 Public Stargaze will be held at the Environmental Studies Center on Girby Road on November 28. All members are urged to bring their telescopes and participate in this important event (cancelled if skies are cloudy). Be prepared to arrive no later than 7:00pm (you may want to show up at about 6:30pm in order to give yourself time to set up). Contact Diane Martin for Further information!

--Next Meeting

The October meeting was (again) cancelled due to an approaching hurricane! The next regularly scheduled meeting will be on 1 November.

Changing Astronomy Marketplace

On a sad note, Coulter Optical, the well-known producer of low-cost (but EFFECTIVE) Dobsonian telescopes, has closed its doors--apparently for good. According to a post on CompuServe by the



The 'Great Comet' of 1843. Will Hale-Bopp be remembered as another Great Comet? See 'Comet Update' in this month's 'My Back Pages' for further info!

daughter of Coulter owner Jim Braginton, a recent severe automobile accident and other health problems have left him unable to continue the business. Mr. Braginton's sons tried to keep Coulter going, but without much success. This is a doubly sad situation since the entire family apparently depended on the business for their livelihood.

It seems, ironically, that it was the success of Coulter's ad campaign for a proposed new 16" telescope which caused the company's final demise. Reportedly, problems with a very thin 16"

mirror which Coulter tried to use in a mirror cell which offered only 3 point support combined with an avalanche of orders generated by a very appealing advertisement (still running in the November issues of the astronomy magazines) to bring down the company. I understand that it became evident to family members that they had no hope of fulfilling orders for the scopes (according to hearsay there was over a year's backlog of orders for the 16" alone) in any reasonable amount of time. Shortly before declaring bankruptcy, it is rumored that Coulter considered bringing back the famous 17.5" Odyssey II, which had been discontinued in favor of the 16", but by this time further operation was deemed impractical.

While Coulter, which has been a prominent fixture in amateur astronomy since the '70s when it became known for its Cassegrain mirror sets and small rich-field reflectors, will definitely be missed, things are not too bleak for prospective (low-cost) Dob purchasers. At this time, both Orion and Meade are producing well-crafted Dobsonians with excellent optics at prices comparable to those of the Coulter Odyssey line. What remains to be seen is whether Orion and Meade will keep their prices low with Coulter out of the picture. Only time will tell.

Anyway, I'm sorry to see a basically reliable and honest company leave the telescope business. Many of us had occasional complaints about Coulter, whether it was long delivery delays or a few lapses in optical quality. But I, for one, felt that Jim Braginton believed the words he wrote in his ads and catalogs. His 'Odyssey' telescopes weren't much to look at, but they were built with love, and they inspired a life-long love of the cosmos in many a new amateur.

In a similar vein, I have unofficial word that Kenneth Novak & Co., longtime supplier of high-quality telescope parts, has closed. It seems that Mr. Novak has retired, and that he has not passed the

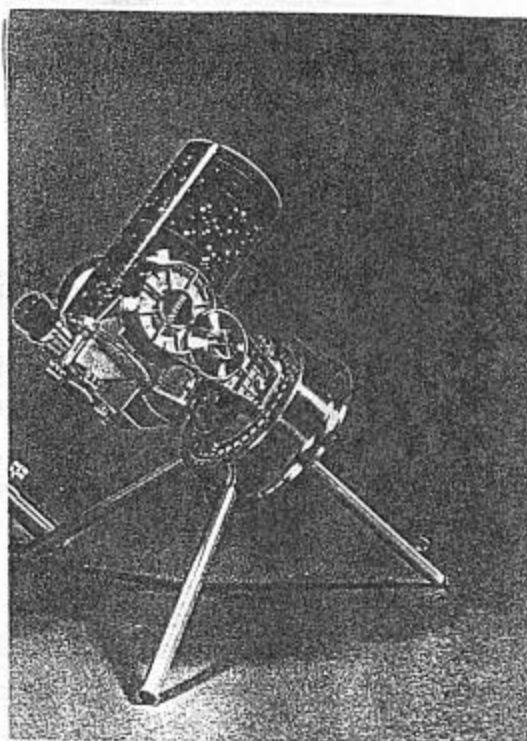
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Skywatch
C/O Rod Mollise
1207 Selma St.
Mobile, AL 36604
(334)432-7071
FAX: Same
E-mail: maf00068@maf.mobile.al.us

If possible, submit materials for *Skywatch* in machine-readable form. WordPerfect 6.1/6.0/5.1 format is preferred, but a wide range of word processors are supported. Members of the Mobile Astronomical Society receive their issues of *Skywatch* at no cost at Society meetings, but mail subscriptions to *Skywatch* are available for a nominal fee. Unless otherwise noted, the entire contents of *Skywatch* is copyright © 1995 by Rod Mollise. If return is desired, postage must accompany all manuscripts, drawings, photographs, etc.

business on to anyone. While Novak's service has reportedly not been very good in recent times, with long delays on orders the norm, I remember buying some very well-made parts from him (his rack and pinion focusers were *really* beautiful) which were delivered PROMPTLY. About five years ago, I was regularly receiving my purchases from Novak in a week or less.

Finally, Questar, the famous maker of high quality Maksutov telescopes has filed for Chapter 11 Bankruptcy. Many of us Amateur Astronomy Veterans from the 60s and early 70s remember lusting after Questars, which always seemed to cost about *twice* what we could afford to pay (at least). While the coming of outstanding and *affordable* SCTs from Celestron and Meade, and the big Dobsonian revolution somewhat lessened the appeal of Questar's jewel-like 3.5", 7" and 12" Maks, the company continued to be prominent in the world of amateur astronomy. It has only been in the last couple of years that Questar relinquished its ad space on the inside cover of *Sky and Telescope* magazine (*every Sky and Telescope* for years and years). Here's hoping that the company gets its act back together (hey, how about a \$2000.00 7" Questar Mak?).



Comet Update



The 'Notorious' Comet Kahoutek (1973 XII) actually put on a nice show for amateur and professional astronomers!

Hopes remain high that recently discovered Comet Hale-Bopp will indeed turn-out to be the spectacular comet we've waited for. Initially most observers were cautious, fearing that the comet's brightness was the result of a short-term outburst, and that it would dim (as did the notorious fizzling comet, Comet Kahoutek) when it hits the inner Solar System. Hale-Bopp, however, seems to be doing a good job of maintaining its brightness. The supposed large size of the comet's nucleus augers well for a spectacular show in 1997. Already some of the caution is being thrown to the winds--witness the text on the cover of the November issue of *Sky and Telescope*: 'Could this become the next great comet? Believed to be 10 times larger than Halley's Comet, newly discovered Comet Hale-Bopp may grow 100 times brighter.' Well, I hope so. But whatever the eventual fate of this comet, amateur and professional astronomers will undoubtedly have an 'interesting' couple of years (the tabloids and fringe groups are already declaring that the comet will hit the Earth!).

