



REFLECTIONS

REFRACTIONS

of the University Lowbrow Astronomers

August 2002



The University Lowbrow Astronomers is a club of Astronomy enthusiasts which meets on the third Friday of each month in the University of Michigan's Physics and Astronomy building (Dennison Hall, Room 130 or 807). Meetings begin at 7:30 PM and are open to the public. Public star parties are held twice a month at the University's Peach Mountain Observatory on North Territorial Road (1.1 miles west of Dexter-Pinkney Road; further directions at the end of the newsletter) on Saturdays before and after the new Moon. The party may be canceled if it's cloudy or very cold at sunset. For further information call (313) 480-4514.

This Month:

August 3rd Public Open House and Star Party at Peach Mt. come and feed the mosquitoes!
August 10th Public Open House and Star Party at Peach Mt.
August 16th Lowbrow Meeting at 7:30pm at Dennison Hall. Speaker TBA
Also note that our web site has a new URL: www.umich.edu/~lowbrows/ Thanx Dave!!

Next Month:

August 31 Public Open House and Star Party at Peach Mt.
September 7th Public Open House and Star Party at Peach Mt. come and feed the mosquitoes!
September 20th Lowbrow Meeting at 7:30pm at Dennison Hall. Speaker TBA
Also note that our web site has a new URL: www.umich.edu/~lowbrows/ Thanx Dave!!



Clayton Kessler has captured this wonderful image M8, the Lagoon Nebula and Cluster, NGC 6523 in Sagittarius at his "Seven Sisters Observatory site in Manchester, MI.

Clayton didn't provide any photo stats on this one but when they look this good ... who really cares! Thank you, Clayton for sharing your expertise with us, once again!

Just A Few Hours, One Night **By Mark Deprest**

One of favorite places to do deep sky observing is Ludington, MI and whenever I go there I always take as much aperture as possible. This year was a little different, this year it was going to be just my wife and me and kind of a second honeymoon for us. So, in the interest of actually staying married I left the telescopes at home, (but I did bring a set of 10x50 binoculars.) I also brought Phil Harrington's list of binocular double and multiple stars, in the form of a downloaded set of finder charts from the Spirit of 33 group's website.

In case you are not familiar with the Spirit of 33 group, they are an international group of binary and multiple star enthusiast that have put together an impressive network of information, observational data and comradery with people around the world who share a common interest in binary and multiple star observing. This group has put together a number of observing projects, that list 33 binary or multiple stars in a number of constellations, for people who just need an excuse to look at, split and test their star hopping abilities on binary stars, (not that I ever need an excuse.)

One of their members went a little further and produced a full set of charts for each of the projects complete with "Telrad" circles, which are downloadable in PDF format, from:

<http://digilander.libero.it/alparavenna/33doppie/33doppie.html>.

He also produced a full set charts for the Astronomical League's 100 Double star list and Phil Harrington's list of "Double Stars for Binoculars." The latter is the set of charts I decided to take along with me on my "second honeymoon" just on the off chance I might get some time to do a little observing one evening.

The first day at the beach I was able to go through the list, which is sorted alphabetically by constellation, and mark the ones, which would be well placed for summer viewing. Since the field of view in my binoculars is a little better than 5 degrees, the "Telrad" circles would work well for my expected FOV. I won't go into any details except to say we had a wonderful weekend. My wife and I enjoyed some of the best weather Michigan has to offer in one of our favorite places.

As fate would have it Saturday night was my night for observing. I had a good idea where I'd set up for a night of Bino-Binary Bustin' and as the sun set, I got my gear together. My gear consisted of: 10x50 binoculars, folding chair w/ foot rest, portable CD player and proper mood music, red flashlight, finder charts, and bug repellent. The observing site I picked out was about 100 yds. from Lake Michigan on a sand dune just north of Ludington, MI out M116 and just before the State Park. From this vantage

point, I had an unobstructed view for a full 360 degrees with only a small 5-degree light dome in the south toward Ludington.

As the sky grew darker the stars grew brighter, by 10:30pm the summer Milky Way extended from the southern horizon all the way to the north - northeastern horizon, the sky seem to overflow with stars. I sat and watched satellites gracefully criss-cross the sky for an hour. The Milky Way seemed bright enough to cast a shadow, as I started my observing project for the night.

I decided to do one constellation at a time; Ursa Major was my starting point, and Mizar / Alcor was an easy split for even a casual observer, but Mizar's closer companion takes at least 10x50's to split or elongate.

65 Ursa Majoris is a nicely match pair of 6.5 magnitude stars about 4 degrees southeast of Chi Ursa Major and my second successful binocular double for the night.

10x50 binoculars are right at the limit for this kind observing, they are large enough to see and split most of this list and still light enough to be able to hold steady without a tripod. A pair of 9x63's will work very well also, and of course a good set of IS (image stabilizing) binoculars will do a wonderful job provided they have enough aperture to pick up some of the fainter stars.

Which brings us to my next target S 598 a triple star system consisting of a 5.5 mag. primary and an 8th and 10th mag. companion stars. The primary and secondary were easy enough but I had to work a little bit to see the 10th mag. member of this group. Only by coming back to it three or four times could I be sure that I was actually picking up this faint companion.

My next target was Wenecke 4 (a. k. a. M40), John Hevelius must have been looking at this with a scope that has poorer optics than my pair of 10x50 binoculars because in my binoculars these two 9th mag stars do look like a fuzzy comet but only if you give it a cursory look when you spend a few moments and steady yourself the individual components are quite apparent.

My next binary to bust in Ursa Major was Struve 1863, which consists of a 6.6 mag. primary and a 7.1 mag secondary, my list calls it an optical double, and they looked fairly even in magnitudes to me. But what I found interesting was that while star hopping my way over to its location in the night sky, I swept up M101!

Well, this prompted a quick look for M81 and M82 and to my surprise and delight I was able pick them up very easily, plus with a little work NGC 3077. You know every time I look at NGC 3077, I wonder how Charles Messier missed it.

Okay, that takes care of the binocular binaries in Ursa Major, now I decided to do the only one listed for Ursa Minor, Pi 1 is a very pretty pair with some subtle color contrast.

The 6.6 mag and the 7.3 mag set are located about 2.5 degrees west of the mid-way point between Epsilon and Zeta Ursa Minor. I was going to spend the rest of my binocular observing session scanning the Milky Way, but after seeing those faint fuzzies to the north, I thought I'd try a few more. In the rising Cassiopeia M103 and M52 were easy open clusters to see in the 10x50's.

So let's go look at the Cygnus region and start with M39 and then the North American nebula, Wow! That area of the sky is so cluttered with nebulosity that I had trouble finding the intended target. But, once I restarted my star hop from Deneb, I found it without too much trouble.

The Cygnus region of the Milky Way is an area of the sky that always impresses me with its rich star fields and nebulosity, I've said many times that one could a lifetime exploring Cygnus. After the North American nebula, I took a look at the veil nebula area just for kicks and to my delight there was a hint of nebulosity there also! 30 & 31 Cygni (Omicron 1) is a beautifully color contrasting triple star system for binoculars with the primary showing an orange hue, the second and third components are bluish in their hue. Albireo was my next stop and as I moved the binoculars along the path of the Milky Way scanning the chains and clusters of stars, I thought to myself, "how lovely the night sky can be" and a sense of peace came over me. Then instead of feeling small and insignificant my "being" seem to grow infinite and I felt a real part of the universe.

After observing the Maize & Blue stars of Albireo, I raised the 10x50's slightly west to find the much over looked globular M56, which appeared as grainy fuzz patch in an incredibly rich field. Lyra was my next constellation to examine with the 10x50's and as you can probably guess by now it did not disappoint me. The Ring Nebula was very small and almost stellar in appearance and one might pass right over it if you didn't know it was there. Delta 1 & 2 Lyra are a beautiful wide, contrasting, orange and blue pair. Epsilon 1 & 2 (the double, double) splits naked eye and with binoculars they appear as an evenly matched pair of white stars.

The night was moving on toward 1:00 am and I wanted see the Dumb-bell and much, much more, so I moved east to Sagitta and I found M71 the faint globular cluster that lies between Delta and Gamma Sagittae. Then sliding the binoculars to the west and there it was; M27, the Dumb-bell nebula, bright, square and large.

Moving south and a little farther west and I swept up the Coat Hanger asterism and the open cluster NGC 6802 in Vulpecula. Next stop, Aquila and M11 then south to Ophiuchus and the open cluster IC 4665 (the HI cluster). The green planetary nebula NGC 6572 was stellar in the 10x50's, but the open clusters NGC 6633 and IC 4756

were spectacular.

I was on a roll now and the heart of the galaxy was directly ahead. M17, the Swan nebula was almost naked eye so it was easy for the binoculars, and in the same FOV the open cluster M18, scanning south down toward the galactic center and there is the Sagittarius Star cloud - M24, a little further to M20 the Trifid nebula, and then to M8 the Lagoon nebula and cluster. Sagittarius is loaded with Messier objects, 15 to be more precise, more than any other constellation, and M22 is the best globular cluster in the bunch and a very easy binocular object.

It was getting late so I moved over to the west and M6 & M7 in Scorpius then a little north to Antares and M4. I gave M80 a quick look and then it was time to leave.

I had a 3-hour drive home later that morning and check out time was 10:00 am, it was 2:00 am and my eyes were getting weary. So, I packed up the equipment and headed to where I had parked the car. Listening to the waves gently slapping against the beach, I thought about the night's observing session and I realized I had missed M13 in Hercules, so I grabbed the binoculars and started to look for The Kneeling One, just as I was about to raise the 10x50's to my eyes, there it was, the Great Hercules cluster and I was seeing it without optical aid. What a perfect way to end a wonderful night.



Mark Deprest and Harry Juday after a club meeting. Mark has been a member of the club since 1995, has served as both President and Vice-President and is currently the Newsletter Editor.

Dob-servin'

By Christopher Sarnecki

A night of excess - Friday night, July 5th. I met several invited observers out at Clayton Kessler's future home and dark site north of Manchester. The night was exceptionally clear and the site was extraordinarily dark. So dark in fact, that Clay's site rivals the Lake Hudson Recreational Area, west of Adrian, favored by many Lowbrows. A small faint A-squared nebula, in the east, was the only minor light pollution to be seen. Low horizons were available all around, especially the prized summer southern sky. The best part of all was the commute. Driving to Lake Hudson usually takes me almost 1-½ hours, but the road trip to Clayton's was less than half that. Next time you see Clayton ask him about his building plans. An observatory is rumored.

I have been reading a book that can be recommended to anyone whom considers himself or herself a dedicated observer. Deep-Sky Wonders, by Walter Scott Houston has become my book of choice to find those new observing challenges that keep me looking forward to the next night of new adventures under the stars. The book is a reprint of many of Houston's best Deep-Sky Wonders columns originally appearing in *Sky & Telescope* magazine from 1946 to 1994. Deep-Sky Wonders is dedicated to observational amateur astronomy. Arranged in a monthly fashion, the reader only has to read up on the current month's chapter to find out 'what's-up'. Now on to the dob-servin'. Every one knows summertime is globular cluster time. Scotty's book turned me on to number of new NGC globulars. Before I knew it, I managed to bag some 30 mostly non-Messier globulars before the night was over. Some of the interesting ones you may wish to check out are:

- NGC 6144 - A medium angular sized (9 arcmin) overlooked prize about a degree northeast of M4 and even less northwest of Antares. While the 9th mag brightness might fool you into thinking this one is easy, it has a lowish surface brightness, but you should be able to resolve stars in a medium sized scope.

- NGC 6522 and 6528 - A pair of 10.5 and 11th mag globs just northwest of *Alnasl*, Gamma Sagittarius, the star that forms the tip of the spout in the teapot. Both objects fit in the same low power field of view. Above this pairing is the famous Baade's Window, an area of the Milky Way that is free of obscuring dust and gas with a view in to the center of our galaxy. It is a riot of thousands of stars with two globulars thrown in!
- NGC 7006 - Line up the two northern most stars, Gamma and Alpha Delphinus in the dolphin asterism and move your scope due east 15 arcmins (3 ¾ degrees) to this 10th mag globular. Only slightly larger than an arcmin, it is a whopping 110,000 LY distant.

Fear of Planetarys - Planetary nebulas are term astronomers first gave to these swollen greenish-blueish stellar disks because they looked the planet Uranus. I have never enjoyed planetary nebulas much beyond the Messier's four bright planetarys M27, M57, M76, and M97. It seems that most of these objects are smallish and too faint to be differentiated from field stars. Recently, a number of Lowbrows have turned me on to a number of NGC planetarys that are not difficult to locate and observe. Also, I have learned that, yes, higher magnification is required; but more important, is what to look for. High magnification helps turn these stellar looking objects in to resolvable disks. Many of the brighter NCG planetarys are noticeably greenish or blueish color. Others, like NGC 2392, the Eskimo planetary in Gemini, (a winter object) have an observable central white dwarf star. This central star is easy, try it. Some even have discernable shapes beyond the usual circular disk. The Ghost of Jupiter, NGC 3242 in Hydra (a late winter, early spring object) has a pair of ears viewable in the scope.

A technique for helping one to locate the planetary from its stellar neighbors is to hold an Oxygen III filter up to the high power eyepiece. The nebular will respond well to filter while many of the fainter stars will drop out of the picture. My experience is the OIII filter overpowers some the fainter features of the nebula. So I

typically will not screw the filter into the eyepiece, but hold it over the eyepiece. Once I view the nebula in question I put the filter down and enjoy the view without it. If I can warm up to planetaries, than any one can. Some summertime NGC planetaries are listed here. Check 'em out.

- NGC 6572 in Ophiuchus should be titled the 'Green Nebula'. Rumor has it that Mark Deprest is responsible for bring this object to our attention. At low power this nebula looks unmistakably GREEN! At higher magnification the object takes on a blueish color.
- NGC 6543 (now that's a number you can remember!), the Cat's Eye, a 20" planetary in Draco with an 11 mag central star. At low magnification it looks like a swollen star, at magnifications over 100X an extended shape starts to reveal a spiral structure reminiscent of the classic helical shape seen in long exposure photographs.
- NGC 7009, Saturn Nebula, an 8th mag object in Aquarius. To locate this object place the 4.5 mag star Nu Aquarri in the scope and simply move the scope 1 ½ degrees west. In moderate to large scopes faint extensions are visible on the east and west sides giving this object a 'Saturnish' look.
- NCG 6826, the Blinking Nebula in Cygnus is a 9 mag, 30" nebula, with a central star of similar mag. At powers over 100x something interesting happens. Looking at this object with adverted vision will reveal the planetary disk. Looking directly at the central star and the disk disappears, hence the name the Blinking Nebula.

Perhaps some of you read the article in Sky & Telescope's Observer's Log last year (September 2001) on locating the central star in the Ring Nebula. Well, I always wanted to attempt observing this object. The article tells us that picking out the central star one needs a 8 inch scope minimum, high magnification, a night of steady seeing, and the faint magnitude star chart reproduced showing stars fainter than

the Ring's 15th mag central star. Together with Clayton and Jeff WHN, ccd imager extraordinaire from the DAS, we set out to see this star. Using the chart, we located a star at an incredible 15.7 mag opposite a 13 mag star bracketing the center of the ring. Waiting for moments of steady seeing we manage to pick out the central star flashing momentarily in and out of our view. I am convinced that other Lowbrows can pick out this star if you follow the steps we took. Remember to look for the central star when the Ring is at zenith to eliminate looking through too much atmosphere.

Observing Challenge - NGC 6822, Bernard's Galaxy, 19 h 45 m RA, -14 degrees 48' Dec is an 11 mag dwarf galaxy +/- 10 degrees east northeast of the teaspoon asterism in Sagittarius. This galaxy is large, 10' x 20' in size, with low surface brightness. Robert Burnham, Jr. of Burnham's Celestial Handbook indicates that it is visible in 6" - 10" scopes (presumably from the Lowell Observatory) and easier than the Veil. This object's location is easily to find since three 5th mag stars point the way. You may want to save this one for your summertime dark site. I'd be interested in hearing from anyone spotting this object.



Chris Sarnecki with his old 13" and his observing table / accessory case at the Kensington Star Party.

Telescope Topics:
"Grinding and Polishing Machines"
By Tom Ryan

As a teenager who was just getting into astronomy and telescope making, I wanted to experience all phases of the hobby. One of those phases involved building a machine to grind and polish telescope mirrors.

I had already made a number of mirrors by hand, both for myself and for others, and I had formed some pretty firm ideas about what I liked and what I didn't like about making mirrors. For example, I roughed out a 12.5" diameter full thickness Pyrex blank to an f/2.5 curve by hand, and having done it once, decided that I never needed to do that again. Diamond generation of the curve was definitely the way to go, when there was a lot of glass to remove. Fine grinding was boring but tolerable. Edge beveling and pitch lap making were OK, but nothing to write home about. Polishing seemed to take forever to get nowhere, and the mere thought of polishing deterred me from making any number of mirrors. Figuring, though, was fun. I liked figuring, and I liked testing even more.

I felt that an automatic mirror grinding machine would take a lot of the drudgery out of the process. Diane Lucas, who was one of the members of the club that I belonged to at the time, had actually made a mirror grinding machine to make her Maksutov. About it, she said, "The faster it turns, the faster it grinds", or something to that effect, and armed with this little bit of knowledge, I decided to build a machine for myself.

Of course, being a teenager, I had to substitute ingenuity for cash. Fortunately, the scrap metal yard was within biking distance, and yielded a motor and a number of useful looking bits and pieces. My grandmother was getting rid of an old wringer washer (and who among you has ever actually seen and touched one of these?), which would be perfect for the grinding machine. The agitator was inverted and a plywood board was bolted to the top, to hold the mirrors. The gearbox was hacksawn apart and a few critical parts removed or cut away, so that now the agitator spindle would turn continuously, rather than back and forth. The wringer rollers were removed, and their drive shaft was employed to move the overarm by some mysterious method that escapes me today. I bolted the motor on, connected a few pulleys, stood back and turned it on. The darn thing worked!

I eagerly began work on an 8" mirror. This machine had taken weeks to build, but I was sure that it would save me so much time over the next few years that it would be worth it.

I was much less impressed a couple of hours later. Yes,

the machine did everything that the machines in the ATM books did. What it didn't do was load new abrasive automatically. It turned out that the process of stopping the machine, disengaging the overarm from the mirror and moving it aside, cleaning off the spent abrasive, adding fresh abrasive, reconnecting the overarm, and restarting the machine just about tripled the time it took me to do the same thing by hand, and involved a lot more of my labor. I couldn't just start it up and walk away, either, because a fresh charge of abrasive would last about two minutes, and then I would have to replace the abrasive again.

I felt that the machine was a huge failure, and told my friends so. One of them, though, Rob Hubbard (recently of Kitt Peak), decided to grind his 10" mirror on it. His subsequent success owes less to the machine than to his unflinching determination and optimistic nature. I personally never used it again. Right now it's holding up newspapers in my father's garage.

So matters stood when I met Karl Mueller, who owns several Strasbaughs (real polishing machines), and is a master optician. I asked him how he uses his machines, since I found them to be worse than useless for grinding mirrors. He told me that he never uses them for grinding. Instead, he diamond generates all the curves, fine grinds the resulting surfaces by hand, polishes the surfaces on the machines, and figures by hand. He showed me how to make diagonals (flats), and polishing these pieces does not involve stopping the machine. The operator just squirts some polishing slurry onto the pitch lap whenever it starts making too much noise. You can even read a book while doing this.

Consequently, I bought a Strasbaugh myself, and used it to polish a couple of Cervit flats. I ground them by hand until they showed little or no light under a straightedge. They polished out on the machine in about an hour, and were about 25 fringes from flat. Another hour and a half was spent getting them flat to an eighth wave or so by adjusting the machine's stroke length. Getting them closer to flat than one-eighth wave needs to be done by hand, but the machine was a wondrous help. I looked at the flats every 30-40 minutes, to check on their progress (ten minutes near the end), and spent the rest of the time machining a fork mount. Suddenly, a lot of desirable optical systems (Cassegrains, field flatteners, trischiefspiegler, etc.) seem a lot closer.

So you can see what happens when you just ask for directions, and don't try to use a screwdriver as a hammer.

Double Star Projects:
The Spirit of 33
By Collin McClain

Well it look like it was going to be a pretty good night for looking at the stars but it was almost a full moon so the deep space objects weren't going to be as impressive as they are on dark nights. So I thought I'd try and hunt down some double stars and see how many I could split with an almost full moon dominating the sky. About a year ago I came across a website dedicated to double star observing, it's called "The Spirit of 33 - An international network of double stars observers." <http://www.carbonar.es/s33/33.html>. They have a nice list of observing projects broken down by constellation, "33 in Virgo", "33 in Taurus", etc.

I thought I'd try the 33 in Cepheus project. There were several aspects of doing this project that I enjoyed so I thought I'd share them with you. The first step was to lookup the 33 doubles and locate them on my Sky Atlas 2000. I have the deluxe non-laminated version. This allows me to circle the doubles on the charts and write in their names. After locating all the doubles I then looked at the arrangement and came up with a strategy for the hunt. Now I enjoyed using the transparent overlay with the grids that comes with the atlas, it's the only time I use the thing. But I realize this may not everybody's cup of tea so the website does have star charts for some of the constellations.

By this time my telescope should have cooled off well enough and it was starting to get dark with the moon just starting to rise. I noted that the moon had a very strange green glow when it was just coming up, I don't know what could be in the air to cause that. The first time I tried one of these 33 projects I used my XT8 DOB and had pretty good success. But since then I've gotten an Intes MK66 Maksutov-Cassegrain on a GP-DX equatorial mount so I was looking forward to see how well the Mak was going to do with the harder doubles on the list. The MK66 has a focal length of 1800 mm and I primarily used a UO ortho 12.5mm and a Televue Radian 6mm for the close doubles.

I picked Cepheus because it was at a good location in the sky this time of year. One nice thing about these projects is that they're confined to just one constella

tion. This has the advantage of not having to point the telescope all over the sky and not having to perform the physical contortions sometimes required of an equatorial mount. Plus it also gives you a chance to spend an evening on a single constellation, kind of a one on one up close and personal encounter with the King.

The project is a good exercise in star hopping. I used a Telrad just to find my starting spot then an 8x50 right angle correct image finder star hopping with the manual slow motion controls. I could make out only 7 or so stars in Cepheus naked eye. I started at alpha Cephei and started looking for Struve 2764, a fairly easy double with a separation of 7.2 arc seconds and magnitudes 8.3 and 9.0. A note on the observing lists from the website, most of them have a difficulty level, DI, listed for many of the double stars. The site has a page, which describes how they use fuzzy logic to determine the DI values, which range between 0-100. If anybody is interested or knows about that sort of stuff it might be worth checking out. A quick summary, the DI depends on how close the stars are and the difference in magnitudes of the stars. The greater the difference in magnitude the harder to split and of course the closer the harder. For example BU 152 has a separation of 1.1" and a DI of 83.1 but Otto Struve 457 is 1.3" a little farther apart but a DI of 92.6. The star magnitudes were 7.3/8.1 versus 5.9/8.1 respectively. The website has a list as to how to classify the view of a double:

OS: Observed as Single

SE: Slight Elongation

CE: Clear Elongation

EF: Eight Figure

THBC: Thinnest Hair Between Components

CS: Clearly Split

I don't get quite so particular, I just use three descriptions: no split, elongation, or clearly split. The list had 3 that had a DI above 90, I clearly split the hardest one DI=95 but only saw elongation for the other two, 90 & 92.6. Despite the full moon I had good success with the final score: clearly split 29, elongation 3, no split 1. I find that some of the nicer to look at doubles are pretty close in magnitude and are not real tight. That night I noted that Struve 2863/Cephei 17 (8.5" 4.6/6.6) and Struve 2903 (4.3" 6.7/6.7) were quite nice. It took about 2 hours to go thru the list so it's a nice project for an evening.

I thought the MK66 perform quite well, there's a kind of satisfaction using a quality optical instrument on a good mount and successfully hunting down 33 double stars. Using the Radian 6mm gave me a magnification of 300x and a very nice star diffraction pattern. A nice bright airy disk with the first ring somewhat well formed (the seeing wasn't the best) and the 2nd and 3rd rings quite faint compared to the first ring. On the closer doubles < 2" that I could split I could clearly see two separate disks and the first diffraction rings making sort of a figure eight. Kind of cool to look at.

Another aspect of double stars is that sometimes there is a nice difference in the color of the stars with Alberio in Cygnus as the standard example. Also in the process of star hopping around Cepheus I did see a few interesting groupings of stars and also came across a nice red carbon star, S Cephei.

So all in all it was an enjoyable evening and something I would recommend and I'm definitely going to try and complete the other constellations. It'll give you another reason to get the scope out especially on those nights with a full or near full moon.



*Collin McClain: hoping for another clear Moon lit night to get back to some Double Star Splittin'.
Nice article Collin! We all hope to see more!*

For Sale

Coulter Odyssey for \$600. Here are the specs:
Blue-tube dobsonian reflector model from 1983
13.1" f/4.5 mirror (optical experts tell me it's the best Coulter 13 they've seen, star test is very good)
60mm 12x finder (converted Tasco telescope, works great)

Painted white and weight removed by cutting nonessential thick particle board

Two eyepieces included

OPTIONAL

The scope with JMI's NGC-Max pointing computer. Just select the object (for example: Ring Nebula) and the display tells you how far to push the scope over and up until it is in the eyepiece. Database includes over 10,000 objects. You can also plug in your laptop or Pocket PC and use sky software for pointing.

Extra \$500

I am selling to help pay for a 14.5" Starmaster GOTO reflector (any opinions on that scope would also be appreciated).

Brian Ottum

(734) 429-8215 day, (734) 429-3559 eves

Wanted

Your Newsletter articles or photos are desperately need to fill these pages. We want to keep this newsletter fresh and yours, not a reprint of articles already on the Internet.

Please submit them in just about any format you want and I'll try to find a way to print it!

Submissions to:

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Ann Arbor, MI 48105

msdeprest@comcast.net

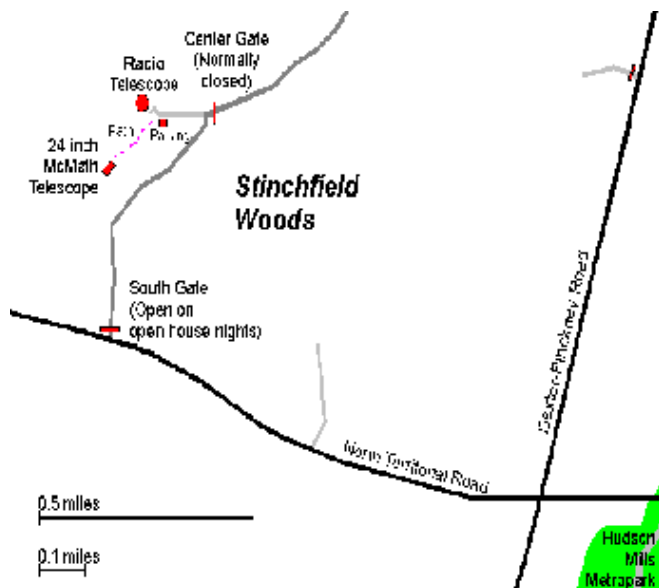
mdeprest@palm.net

(734) 662-5719 or (734) 223-0262



Places and Times:

Dennison Hall, also known as The University of Michigan's Physics and Astronomy building, is the site of the monthly meeting of the University Lowbrow Astronomers. It is found in Ann Arbor on Church Street about one block north of South University Avenue. The meeting is held in room 130. Monthly meetings of the Lowbrows are held on the 3rd Friday of each month at 7:30 PM. During the summer months, and when weather permits, a club observing session at Peach Mountain will follow the meeting.



Peach Mountain Observatory is the home of The University of Michigan's 25 meter radio telescope as well as the University's McMATH 24 inch telescope which is maintained by the Lowbrows. The observatory is located northwest of Dexter. The entrance is on North Territorial Road, 1.1 miles west of Dexter-Pinckney Road. A small maize-and-blue sign marks the gate. Follow the gravel road one mile to a parking area near the radio telescopes. Walk along the path between the two fenced in areas (about 300 feet) to reach the McMATH telescope building.

Public Star Parties:

Public Open House/Star Parties are held on the Saturday before and after each new Moon at the Peach Mountain Observatory. Star Parties are canceled if the sky is cloudy at sunset or the temperature is below 10 degrees F. Call 480-4514 for a recorded message on the afternoon of a scheduled Star Party to check on the status. Many members bring their telescopes and visitors are welcome to do likewise. Peach Mountain is home to millions of hungry mosquitoes - bring insect repellent, and it does get cold at night so dress warmly!

Amateur Telescope Making Group meets monthly, with the location rotating among member's houses. See the calendar on the front cover page for the time and location of next meeting.

Membership:

Membership dues in the University Lowbrow Astronomers are \$20 per year for individuals or families, and \$12 per year for students and seniors (age 55/+). This entitles you to the monthly REFLECTIONS newsletter and the use of the 24" McMATH telescope (after some training). Dues can be paid to the club treasurer **Charlie Nielsen** at the monthly meeting or by mail at this address:

**6655 Jackson Road #415
Ann Arbor, MI 48103**

Magazines:

Members of the University Lowbrow Astronomers can get a discount on these magazine subscriptions:
Sky and Telescope: \$29.95 / year
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Members and (non-members) are encouraged to write about any astronomy related topic of interest. Call or E-mail to Newsletter Editors at:

Mark Deprest (734)223-0262 msdeprest@comcast.net

Bernard Friberg (743)761-1875 bfriberg@aol.com

to discuss length and format. Announcements and articles are due by the first Friday of each month.

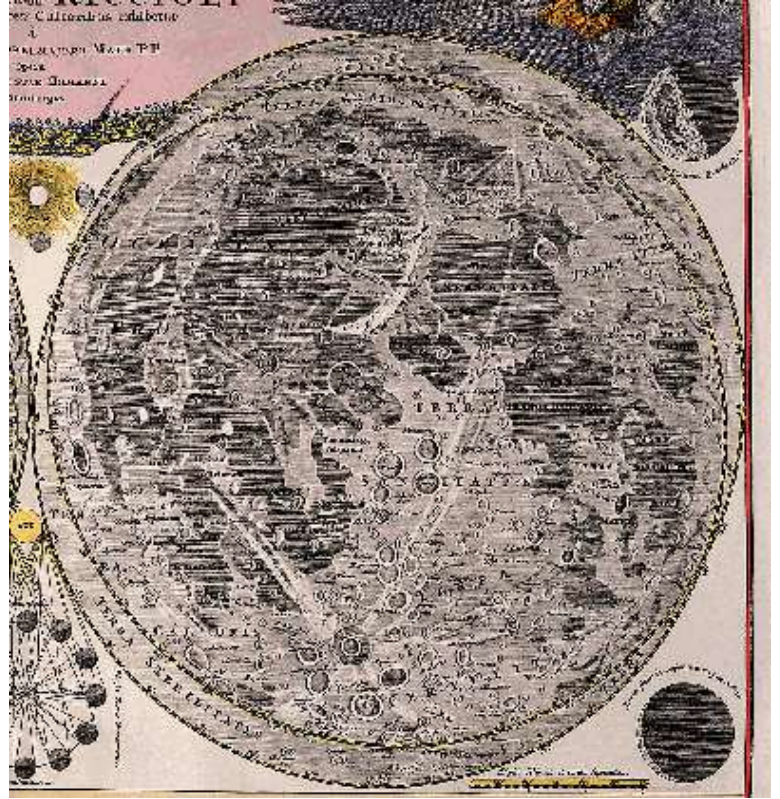
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