



# REFLECTIONS AND

# REFRACTIONS

OF THE UNIVERSITY LOWBROW ASTRONOMERS

May 2005

## Upcoming Events May 2005

- **Saturday, May 7, 2005.** May be cancelled if it's cloudy or too cold. (Starting at Sunset). Open House at Peach Mountain.
- **Saturday, May 14, 2005.** May be cancelled if it's cloudy or too cold. (Starting at Sunset). Open House at Peach Mountain.
- **Friday, May 20, 2005.** (7:30 pm). Monthly Club Meeting. Mark Deprest (University Lowbrow Astronomers) Topic to be Announced.
- **Saturday, May 28, 2005.** May be cancelled if it's cloudy or too cold. (Starting at Sunset). Open House at Peach Mountain.
- **Saturday, June 11, 2005.** May be cancelled if it's cloudy or too cold. (Starting at Sunset). Open House at Peach Mountain.
- **Friday, July 15, 2005.** Monthly Club Meeting 7:30 PM. Special Guest Speaker John Kirchoff of Rider's Hobby Shop in Livonia will present some of the latest products available to astronomers. Meeting to be held at the regular meeting place in the Dennison building because of 50% rain forecast. (Farmer's Almanac)

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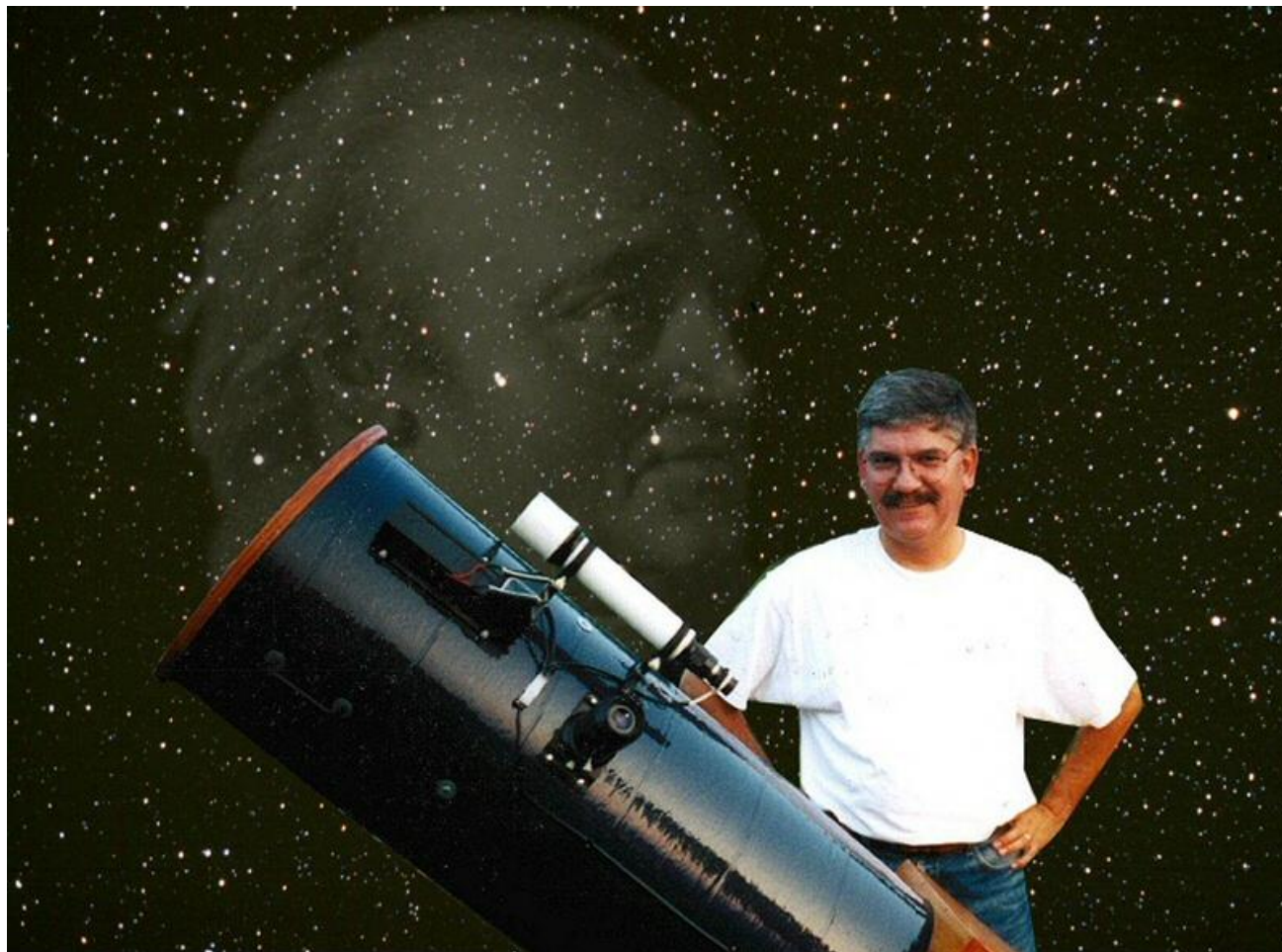
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# On the Shoulders of Giants

*by Doug Scobel*



By now most of you know that last year I completed my observation of everything in the so-called Herschel 400 deep sky observing list. But what exactly *is* the Herschel 400? Did William Herschel himself create the list, or was it his son John? Don't you need a huge telescope and pristine skies to see most of them? Does it make observing all the Messier objects seem like a walk in the park? To help dispel all the mystery surrounding the Herschel 400, I thought I would try to explain what it is, and describe my own personal experience in pursuing it. Perhaps after reading this *you* might want to give it a try.

The first thing we have to do is to travel back to the late 1700's. Amateur astronomer William Herschel (who was actually born Friedrich Wilhelm Herschel in Germany, but moved to England when he was a teenager to study music) was undertaking the world's first systematic survey of the heavens using his large tele-

scope. By the time he finished, he had compiled observations of 2,477 deep sky objects (including a small number of observations made by his sister Caroline), arguably making him the father of deep sky visual astronomy. Later, his son John took his father's telescope to South Africa to study the southern sky, logging another 2,153 objects. In 1888, when J.L.E. Dreyer published the *New General Catalogue of Nebulae and Clusters of Stars*, his compilation of 7840 objects included the 4,630 observations of the Herschels. The catalog, usually referred to as the *New General Catalogue*, or simply the *NGC*, was later revised, expanded to over eight thousand objects, and renamed to the *Revised New General Catalogue of Nonstellar Astronomical Objects*. But objects in the catalog still bear the original *NGC* designation to this day.

In more modern times, in the late 1970's, about the only deep sky catalogs from which amateurs could develop an observing program were the well-known Messier catalog of around 110 objects, and the NGC's more than 8,000 objects. But the NGC was not very convenient, as a large majority of objects are beyond the reach of amateur sized instruments, particularly when used visually. It was then that members of the Ancient City Astronomy Club, of St. Augustine, Florida, created an observing program that they considered a bridge between the Messiers and the NGC. They pulled out 400 objects from the NGC, which would provide a bit of a challenge to experienced observers, yet not be overwhelming. They selected objects that should be within reach of a six inch telescope, when observing under slightly light polluted skies. The founders observed all the objects under skies with a limiting magnitude at the zenith of about 5.5. Surprisingly, some of the objects in the Herschel 400 are also in the Messier catalog, and some are quite large and bright, such as the Double Cluster which is even visible naked eye. But the majority are relatively faint and inconspicuous.

The best place to find the Herschel 400 list is on the Astronomical League's web site, namely <http://www.astroleague.org/al/obsclubs/herschel/herschel400.html>. There you will find the list, and rules and additional information on the award they offer to those who observe all of the objects. The nice thing about this award is that you do not have to be associated with the Astronomical League to receive it. This was accomplished through a special arrangement with the Ancient City Astronomy Club. (With all other Astronomical League observing clubs, you must either belong to a member society, or be a member at large.) One of the goals of the Astronomical League's observing clubs is to develop good observation and record keeping techniques on the part of the observer. So, if you intend to apply for the award, then you will have to keep good records of all your observations. At a minimum, for each object you must provide the date and time of the observation, seeing conditions, telescope aperture, magnification used, and a short note describing your observation.

Okay, let's get to the nitty-gritty. Intentions of the creators of the list aside, what does it really take to observe everything on the list? Today, nearly twenty-five years after the Herschel 400 list was compiled, light pollution has become much more of a problem for deep sky observers. Finding even magnitude 5.5 skies can be something of a challenge for many city dwellers. My guess is that most observers will be severely challenged to observe them all with a six inch telescope. My recommendation is that for most observing sites in southeast Michigan you'll need a scope with at least eight, or maybe even ten inches of

aperture. And of course, you should observe under the darkest skies available to you.

What kind of charts do you need? The ubiquitous Sky Atlas 2000 will let you find a large number of the objects. But in crowded fields such as the Virgo or Coma galaxy clusters, Sky Atlas 2000 often does not provide enough detail to distinguish your target from other objects that may lie nearby. Same goes for objects in fields devoid of enough bright nearby stars for star hopping. Since one of the goals of the program is to develop your observing and record keeping skills, positive identification of your target is essential. So for some of these objects, you'll need more detailed charts, such as those found in Uranometria 2000 or Millennium Star Atlas. Or, you can print up detailed charts using popular computer star charting programs, such as Guide. Of course, you could use a go-to mount or computer assist, but that would take all the fun and personal satisfaction out of it wouldn't it? There are also guidebooks for observing the Herschel 400. I've not used any, but one example is *Observe the Herschel Objects* (Astronomical League, 1980). I believe that there are other titles that may be useful.

The obvious question is, how difficult was it? Not as difficult as you might think. I used my 13.1-inch f/4.5 Dobsonian exclusively, so tracking down the objects themselves was pretty easy. The majority of the objects are not very remarkable, but with a few exceptions they have high enough surface brightness to make them relatively easy to find. I did most of my observing at Peach Mountain, Lake Hudson State Recreation Area, at star parties such as the now defunct SMURFS, the Texas Star Party and the Black Forest star Party, and other locations. I did not find sky darkness to be much of a factor except at "The Hill", which seems to be getting more and more light polluted and higher horizons every year. Light pollution aside, the more difficult problem to overcome was getting enough clear, transparent nights in which to observe. Mid-spring through mid-fall we get decent enough weather here in southeast Michigan, but the rest of the year the clouds are pretty stubborn about letting us see much of the heavens. Plus, during the winter months when it does manage to be clear, it is *cold* – it often takes a concerted effort to get up the gumption to brave sometimes sub-zero temperatures and pack up all your equipment and drive out to a dark sky site.

I did all my observations the old fashioned way – finder scope and star charts, and telescope drive system by "armstrong". As I stated earlier, Sky Atlas 2000 was adequate for most objects, but sometimes I had to resort to Uranometria 2000, or even Millennium Star Atlas. The nice thing about Millennium Star Atlas, besides its huge scale, is that it shows the orientation of all galaxies – something Sky Atlas 2000 and the older edition of Uranometria 2000 do not. Knowing how a

galaxy is oriented relative to field stars is a big help in crowded galaxy fields to get a positive ID. The new edition of Uranometria 2000, which has been totally redone, does indeed show galaxy orientation, and I suspect it would work fine when Sky Atlas 2000 doesn't quite cut it. Sky charting software such as Guide also prints galaxies in their correct orientations.

At the 2004 Black Forest Star Party, I finally finished the list. It took several years, but now it was done. Yeah! At first I did not intend to apply for the award, because of the Astronomical League membership and attending monetary requirements I believed I needed to satisfy. It was only after a bit of investigation and running down some blind alleys that I discovered that there are no such requirements for the Herschel 400 award. So late last year I gathered up all my observation records and sent them in to the Herschel club chair. She acknowledged receipt of my application right away, but it took a few months for her to finalize everything and send me the award. But by late March I received a nice certificate (suitable for framing) and lapel pin, and a congratulatory letter. I'm now official!

So in the end what should one make of this observing "feat" of mine? Perhaps a comparison with the list's namesake will put it into proper perspective. William Herschel had to make his own telescope at a

time when one could hardly consider it a hobby. It was state of the art engineering, where much had to be invented. No Dobsonian mountings, no wide-field, well-corrected oculars, no unit power reflex finders, no enhanced mirror coatings (his mirrors were made of solid speculum metal, an alloy of copper and tin, which tarnished easily). In fact, Herschel could not even track objects as we do. His favorite telescope, with a 20 foot focal length, was so large and unwieldy that its alt-azimuth mounting looked more like an enormous hangman's gallows than a telescope. While he stood at the top of the tube, facing the primary mirror with his back turned to the sky, he had an assistant turn hand wheels, pull ropes, and work levers to keep objects in the eyepiece. He would dictate his observation notes to his wife Caroline who would then write them down. Remember that he had no charts or handbooks to work from – he was exploring what was then the astronomical frontier, meaning nearly every new object he observed, to the tune of nearly 2500 objects, was a new discovery. Compare that to the modern day amateur, with large, stable, trackable telescopes, highly accurate and reflective metal-on-glass mirrors, super-corrected, multi-coated, wide-field eyepieces, detailed star charts, computer databases, and oh, yes, the NGC catalog that Herschel himself started. When I consider all that, I am forced to humbly admit that I have done my observations while standing on the shoulders of a true giant. And I didn't have to stand on my tippy-toes either!



# April Elections Results

Elections for the new year's Lowbrow Officers were held during the April meeting, as dictated by long custom and codified by the Ancient and Honorable Lowbrow Bylaws. Charlie Nielson presided, and managed (mostly) to keep the activities calmed down to a dull roar.

All Officers were returned to their posts (Does familiarity breed, not contempt, but content? How else to explain long marriages to that person who knows you as well as they do?) with the very regrettable exception of Mike Radwick, who couldn't run because his employer threatened to send him out of the country for unspecified reasons. (Did any of you, by foolish chance or reckless disregard for his welfare, inform them that he was a Lowbrow?) However, choosing Honor over Financial Security, Mike has promised to continue his valuable service to the club in other capacities, for which he has our respect and our gratitude.

Mike's withdrawal left open the position of Observatory Director, and two candidates, both of whom have held the position in former years and therefore, it could be said, should reasonably know what they were getting into, volunteered to run again. This fact provided each one with ample ammunition in their campaign against the other, and allegations of feeble mindedness and lack of normal (that's normal, not moral) judgment were rampant. The campaign had most of the trappings of national elections, including campaign ads, back room strategies, appeals both to voter's hopes and fears, and suspicions of voter registration fraud. What it didn't have, however, was Talk Radio, and so, when the election was over, both men shook hands and vowed to cooperate for the good of all Lowbrows.

After which everyone retired to the Brown Jug to eat pizza, drink beer, and reflect upon their good fortune to be part of a truly functioning Democracy, however small it may be. ●

## Lowbrow Officers for 2005:

<b>President</b>	<b>Charlie Nielsen</b>
<b>V.Pres.</b>	<b>Bobby "G"</b>
<b>V.Pres.</b>	<b>Paul Walkowski</b>
<b>V.Pres.</b>	<b>Jim Forrester</b>
<b>V.Pres.</b>	<b>Bernard Friberg</b>
<b>Treasurer</b>	<b>Kathy Hillig</b>
<b>O.D.</b>	<b>D.C. Moons</b>
<b>Web.</b>	<b>Dave Snyder</b>

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## This Could Be Your Last Newsletter

...if you're really lucky No! No! No! Stop that! ...I mean, ...if you haven't paid your dues. Contrary to what many of you may fear, we won't keep sending this to you if you don't pay for it. No *Imprimus*, we.

Kathy Hillig, fresh from her electoral victory and aghast at the state of Lowbrow finances, has instructed your scribe to here give notice to all who haven't paid their dues that you will no longer be able to enjoy the benefits of club membership *gratis*. Those benefits include this highly valuable and informative newsletter, which you are now (presumably) reading. (As opposed to, say, wrapping fish leftovers with it, or just pretending to read it in a bald attempt to avoid catching your spouse's

eye, which invariably leads to a "meaningful discussion" with your spouse, which rates right up there with having a root canal done without anesthetic.)

She means it, folks, and we must agree. Having spent many years attending the school of hard knocks, we believe two things about paying club dues. The first is, "Whatever we pay for, we get more of". The second is, "When the Treasurer speaks, listen very closely".

So. If you've already paid your dues to the club, we say Thank You. If not, and you are of sound mind and body, and feel strong enough to continue, send a check to Kathy. If you aren't, and don't know if you need to pay, call. ●

# Recent Lowbrow Activities

Photos by Dave Snyder

Some of the members of the Lowbrows are more active than others, and some are hyperactive, but perhaps the less said about that, the better. In any case, for the benefit of those club members who choose to enjoy the club activities vicariously (and after the Elections meeting, they are looking smarter and smarter), we would like to present some photos taken by Dave Snyder showing some of the activities that have recently engaged the Lowbrows.

Dave has posted most of these photos on the club website, but like anything else on the web, they tend to be overlooked in the ever-increasing ocean of data that the web makes available. Consequently, we have gleaned a few of the less incriminating photos and are passing them along to you, in case you missed them, or, in truth, the activities they depict.

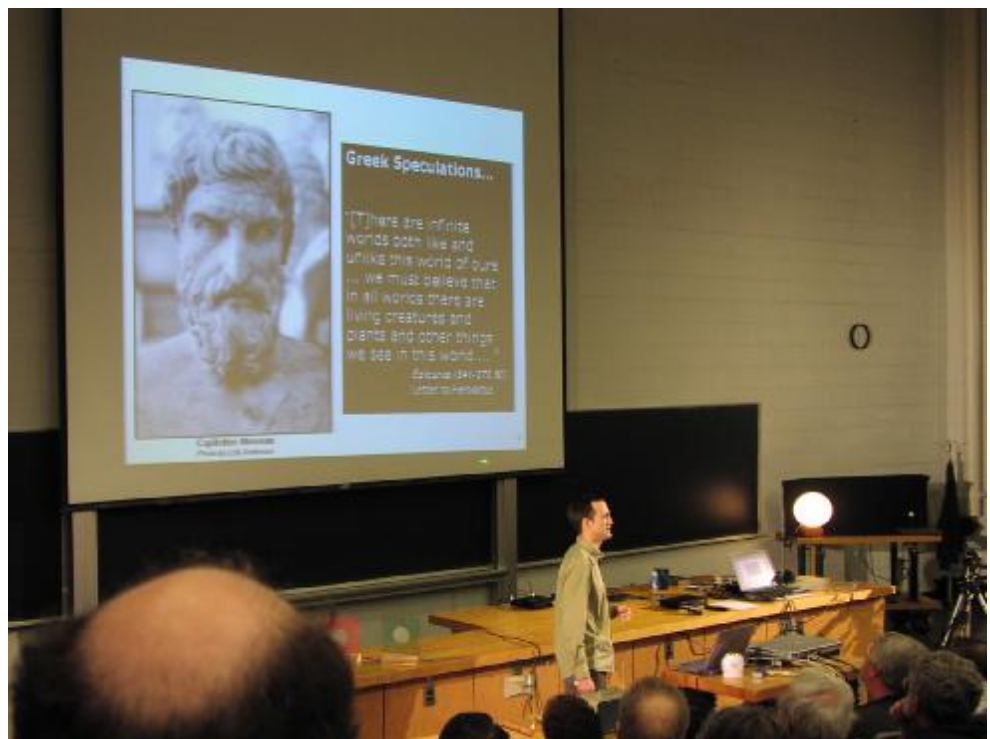
If you happen to be looking for something to do in your free time, the Lowbrows are always looking for a few good women and men to help with various club activities, or just to hang out with. If you are worried that you might not be able to contribute for lack of knowledge, rest assured, we don't know what we're doing, either. We are, however, happy to see others who are interested in astronomy.

## Saturday Morning Physics

One of the favorite activities for club members (and, indeed, for many members of the general public) is to attend the lectures series called Saturday Morning Physics. The lectures are produced by the University of Michigan Physics Department, and feature excellent speakers on interesting topics relating to Physics. The speakers frequently talk about some of the work which they themselves are engaged in, and they are therefore both informed and enthusiastic. The lectures are intended to popularize physics, and are aimed at high school students who may be considering careers in the sciences. For this reason, they are easy to understand (even for old Physics majors, who may have more difficulty than most, because they have to unlearn so much of what they thought they knew.

A schedule for the lectures was published in a previous issue of Reflections, but can also be had by calling the U of M Physics department.

The lectures typically last for one or two hours, after which many Lowbrows retire to a lunch buffet at a local restaurant. The Lectures are free, and afterwards, we get to eat! A truly happy Lowbrow experience.



## Observatory Maintenance

D.C. Moons wasted no time after his election as Observatory Director, and immediately began extensive maintenance operations on the 24" telescope at Peach Mountain. He led a party of Lowbrow volunteers against an army of ants which had taken up residence behind the storage cabinet in the observatory, and a number of mice, which were well enough established in the building to have their own internet addresses. He cleared them all out successfully, and then "drained the swamp" by denying them access to cardboard, scrap paper, and someone's very used sleeping bag. The building was swept out, former Mouse House locations were washed down with Clorox, and great deal of useless junk was hauled to the dump. The place now looks great, and D. C. could rightfully say "Mission accomplished", but he didn't, and instead began fixing up the telescope drive and the surrounding grounds.



The telescope drive had a great deal of backlash in it, so it was disassembled and fixed. Kurt Hillig machined new clutch inserts for the drive, and Mike Kurylo made a new key for the clutch.

In this picture, Lowbrows are examining the keyway to determine if the problem is the key or the key slot, and are checking for damage to the tapered shaft which holds the clutch assembly.

The telescope has been prudently tied down prior to the nut removal process. Once the nuts at the bottom of the shaft are removed, the clutch plate is no longer held in place, and can drop onto the floor.

This didn't happen because D.C. knows how the scope was put together, and planned ahead. (Here he is holding one of the nuts.)

Unfortunately, as is often the case with regular maintenance, more problems were discovered. The drive's main worm was found to be terminally corroded, and needs to be replaced. It was removed so drawings could be made of it prior to getting quotes for its replacement, and then it was put back in place, after a consensus determined that further use of the worm would not immediately harm the irreplaceable worm gear.



None of Dave's pictures of the grounds work done at the observatory have captions, and I wasn't there, so I'm free to make up my own. However, I *do* know that there have been complaints about hornets around the observatory, and soooooo.....



"Hey D. C.! Ken found the hornet's nest. It's in the tree!"



"Alright, men. Managers shuffle paper, but leaders lead, regardless of concerns for their personal safety. I'll take care of this nest myself."

"Paul, is that wise?"

"Charlie, you're talking about DC here."



"I've tied this rope around my waist. If the hornets come after me, on my command, I want you guys to pull on the rope, really fast! Have you got that?"



"Yow Ow Ow Ow  
Ow wow ow ow  
wow oow ow oww  
ow wowawowow"

"Do you think that's the command?"



"...and then the hornets came after me, but the guys pulled on the rope, and as I flew out of the tree, I did a *double* Immelmann turn, and came up behind them, and then...."



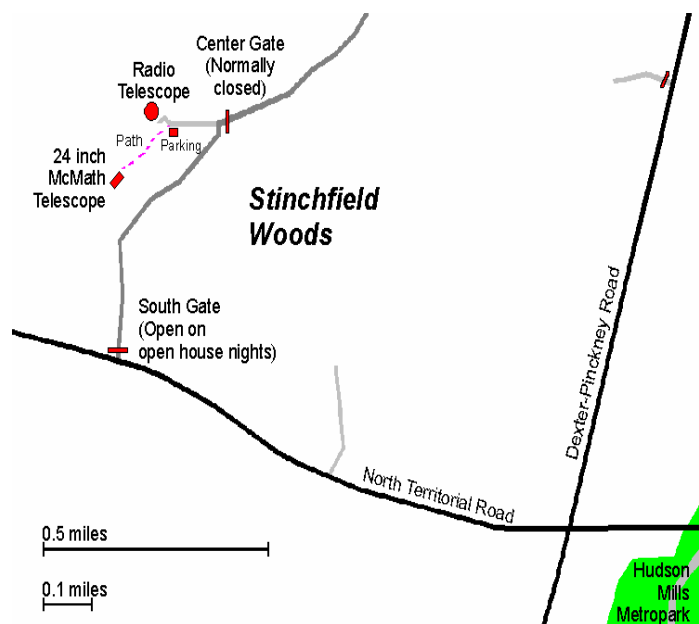
"OK, men. I want you all to hold hands and bow your heads while I thank our Creator that He made us a *whole lot bigger* than a bunch of crummy bugs."





## 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 4332-9132 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 at the monthly meeting or by mail to this address:

Kathy Hillig  
7654 W. Ellsworth Road  
Ann Arbor, MI 48103

## Magazines

Members of the University Lowbrow Astronomers can get a discount on these magazine subscriptions:

Sky and Telescope: \$32.95 / year

Astronomy: \$29.00 / year

For more information contact the club Treasurer. Members renewing subscriptions are reminded to send your renewal notice along with your check when applying through the club Treasurer. Make the check payable to "University Lowbrow Astronomers".

## Newsletter Contributions

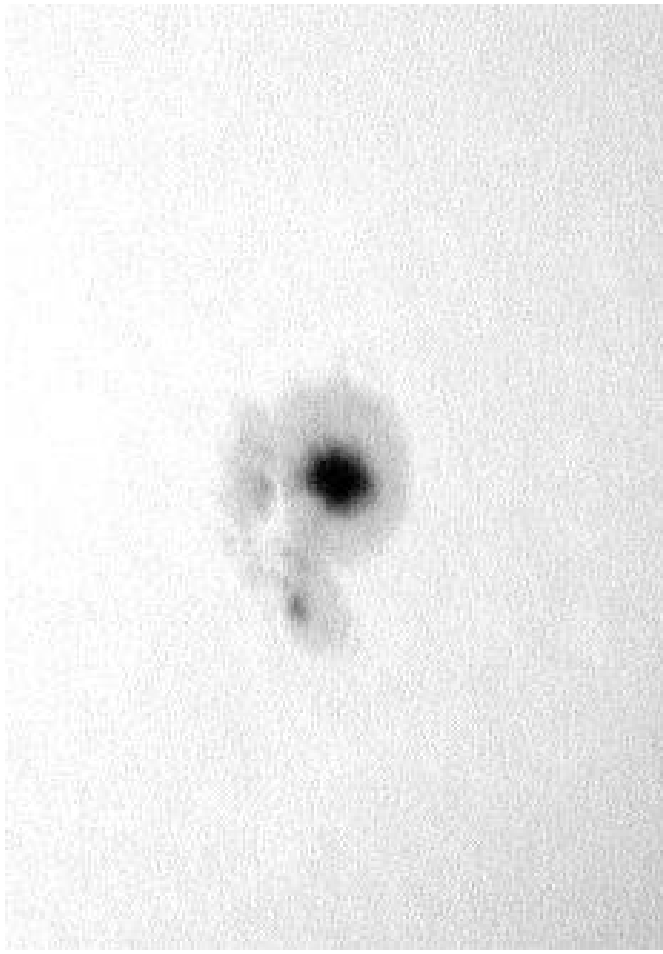
Members and (non-members) are encouraged to write about any astronomy related topic of interest. Call or Email to Newsletter Editor at: John Ryan (734) 662-4188 [allegheny@mac.com](mailto:allegheny@mac.com) to discuss length and format. Announcements and articles are due by the first Friday of each month.

## Telephone Numbers

President:	Charlie Nielsen	(734) 747-6585
Vice Presidents:	Jim Forrester	(734) 663-1638
	Bernard Friberg	(734) 761-1875
	Jim Wadsworth	(734) 529-2766
	Doug Warshow	(734) 998-1158
Treasurer:	Kathy Hillig	(734) 663-8699
Observatory Director:	D. C. Moons	(586) 254-9439
Newsletter Editor:	John Ryan	(734) 662-4188
Keyholders:	Bernard Friberg	(734) 761-1875
	Charlie Nielsen	(734) 747-6585
	Mike Radwick	(734) 453-3066
	Fred Schebor	(734) 426-2363
Webmaster	Dave Snyder	(734) 747-6537

## Lowbrow's Home Page

<http://www.umich.edu/~lowbrows/>



Earlier this month Mark Deprest sent out word of a large sunspot that was crossing the Sun's disk. So on May 4 we finally got a clear day but I was stuck at work that morning. Knowing that the sunspot was fast approaching the solar limb, I kept looking out the window, stewing over how clear and still the air was. Finally, I couldn't stand it any more, rushed home, set up the scope, and whipped off a couple dozen digital images. Threw it all back into the house and went back to work, all in about an hour. Not a bad lunch hour!

Just now I finally got a chance to process the images. Most weren't that great, apparently in my rush I wasn't careful enough to ensure that they were focused properly. This is the best shot of the group (although it looked much better visually) taken through my 8-inch f/8 Newtonian reflector, Nikon Coolpix 800 mounted to an 8mm TeleVue Radian eyepiece. I used a #58 green filter, and then processed the image in Paint Shop Pro.

The telescope was protected with a 7 inch aperture Baader solar filter (making the scope a 7-inch f/9). Enjoy!

Doug Scobel



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