

REFLECTIONS AND

REFRACTIONS

OF THE UNIVERSITY LOWBROW ASTRONOMERS

April 2005

Upcoming Events April 2005

- **Friday, April 15, 2005.** (7:30 pm). Monthly Club Meeting. Election and Swap Meet.
- **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.

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A Gem in the Rough

by Mark S Deprest

It's been awhile since I've written an article for the Newsletter, mainly because I've want others to contribute and some of you have (the rest of you need to step-up to the plate!). The other reason I haven't written anything lately, for the Newsletter is that I have been busy with some new equipment and just had not yet got around to putting some words down on paper.

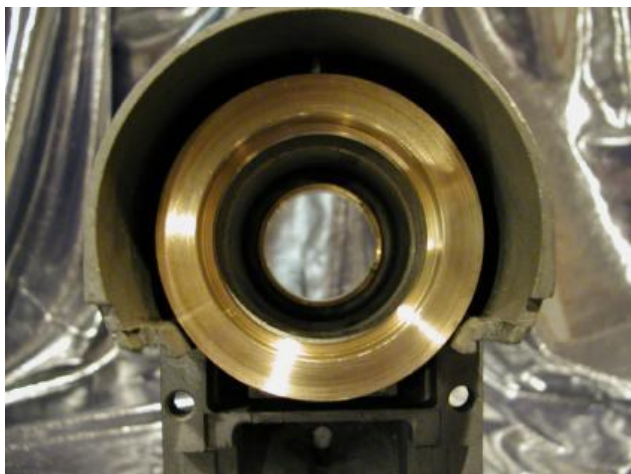


Well, I think, I have enough info to write an article about my GEM. The first thing I should do is explain that GEM is an acronym for German Equatorial Mount, and my GEM is a Meade LXD55 with dual axis drives and Meade's AutoStar computer GOTO system. I purchased it on ASTROMART, which is an online classified system for selling and buying and trading new and used astronomy equipment. (<http://www.astromart.com>) I bought it used and got a pretty good deal on it. Now, the next thing you need to know is that it was just the mount and tripod, in other words no telescope, which is exactly what I wanted, because I intend to put my 5" f/5 refractor on it. With my Taurus Tracker and Hyper-Camera for wide-field astro-photography or Meade's DSI CCD camera for higher power deep-sky digital imaging, this set-up would suit my needs very nicely, and I will add at a reasonable cost (to be discussed later).

Until recently most of my observing has been with equipment that did not track the movement of the sky automatically, if I wanted to examine an object for periods lasted longer than a few seconds, I would have to move my scope manually. This was okay for relatively low to medium powers, however if I wanted to examine an object a high powers this manual tracking was very inefficient, and I now wanted to do some astro-photography. So, tracking devices for my various scopes became a must. I bought a Johnsonian tracking platform for my 12.5" f/5.6 Newtonian reflector and a cheap GEM with a single axis drive (R.A. only) for my 5" f/5 refractor. The former will be discussed in an article written at some other time, the latter, my cheap GEM with a single axis drive suited me fine for awhile, however wide-field exposures of longer than 5 minutes produced an unacceptable amount of star trails and periodic errors on film, at least they were unacceptable to me. I wanted greater accuracy and the ability to take longer exposures, I might add that for visual observations a single axis drive system on a reasonably align mount will be more than adequate for just about everyone.

I looked at some rather expensive mount and drive systems that would more than meet my needs but I was planning on mounting a 5" f/5 refractor that I made using a \$125 cemented Jaeger doublets, that although they are good pieces of glass, they are not color corrected and not fully coated, a \$1500+ mount and drive system would not make a lot of sense. I needed to find a mount and drive system more inline with the \$300 I put into the actual scope. My search led me to Meade's LXD55 series mounts and drives, Meade uses them on a line of telescopes that includes both a 5" and a 6" achromatic refractors. However, Meade does not sell mounts without telescopes and I didn't need to purchase another telescope, so I need to find someone selling just the mount and drive system. It turns out that a number of people who purchased these complete sets did so just to use the telescopes with other drives and mounts, so ASTROMART listed a few and at

little rough in their finish with small burrs or nicks on the surfaces. In a precision instrument like a GEM these produce periodic errors as the gears mesh and shafts rotate in their bearings. The rough finish also makes the drive motors work harder to do the job that they were meant to do.



The grease that is used on most Chinese produced mounts is not very good as far as viscosity and purity goes, and this too adds to problems in the smooth operation on the mount. The computer controlled drive system that came with this mount was Meade's AutoStar system and the specifications on it would be more than good enough for my application, however learning the AutoStar operating systems would provide its own set of challenges. But I knew all of these things before I purchased the LXD55, and was prepared to deal with them one at a time. I had done some research and with a little effort and a free weekend I could have a high quality dual axis computer controlled GOTO scope that should provide a stable accurate platform for both visual and photographic applications.

Now, to see just how rough this GEM was, the LXD55 has been around for long enough that most of the long time owners have found and corrected most of the "bugs" in the system and have established a couple of "User Groups" on Yahoo to help out those first time users. It was from these user groups that I learned of Richard Harris who runs a website totally devoted to the operation and maintenance of LXD55 systems (<http://lxd55.com/>). Almost every one of the long time owners of the LXD55's spoke very highly and recommended his "Hyper-tuning." Now, before

you ask, "Hyper-tuning" is the process of disassembling, cleaning, sanding, polishing, re-greasing and re-assembling the LXD55 mount, to hopefully make it operate better than new. Richard will for a fee, Hyper-tune your mount at his shop, or you can purchase (for about 1/3 the cost) the kit which he sells along with a step by step DVD and do it yourself. Being somewhat apt I opted for the second, not only for financial considerations but also to gain a personal understanding of how GEM's work. Ahhh, that unquenchable thirst for knowledge, I fear it will be my undoing yet, but not this time.

I am not going to do a step by step of the process involve in Hyper-tuning a LXD55 mount, lets just say I learned A LOT!!! I learned that these mounts have a HUGE number of moving parts and if they are not of good to excellent quality they will adversely impact the smooth operation of the mount dramatically. I also learned that some of the HUGE number of parts that these mounts have are not of the highest quality, for instance there are 8 plastic washers/bearings that were cut poorly, these were replaced with "Teflon" ones during Hyper-tuning and the grease was very sticky and of low quality, this was replaced with high grade white lithium grease. A number of gears had little burrs in their teeth and inadequate set screws to hold them to their respective shafts; these were addressed during the Hyper-tuning also. Now, don't get the idea that my mount was a mess or that Meade produces poor products, quite to the contrary, I only point out these imperfection to illustrate how a mass produced mount can be improved. Once I finished all the cleaning, sanding, polishing, and re-greasing, I re-assembled the mount and checked its performance and needless to say, I was pleased.



Now, I wanted to check the Polar Alignment Scope that comes with this set-up and make sure it was align perfectly in the R.A. shaft. The easiest way I know how to do this is; while in the R.A. shaft center a point some distance away and manually rotate the mount on it R.A. axis. If the object stays in the center then the Polar Alignment Scope is align properly. If the center of the PAS loops around that point then you need to adjust it, my PAS had three set screws for this type of adjusting, and I found that my PAS was way off! No matter how carefully I would do my polar alignment at the beginning of the night, it would not have been any good with a PAS that far out of whack! After about a half hour of adjusting and tweaking I got it right, and now when I go out and polar align I can be confident that it will be right!

The next thing I needed to do was learn how to use the AutoStar computer control system. Meade provides a nice little instruction manual that gives one a basic out-

line of how to operate the system and some idea of how to set-up your scope, but I found it to be a little weak in detail, but some practice time under the skies and I should be able to figure out all the little tricks, after all it is very tried and proven system. The only problem will be the manual's "too small" print in the dark! Meade you need to do a better job here! But I'll manage to get the hang of it after a few trials and errors.

So, what's the bottom line? Well, I spent about \$300 on the OTA (optical tube assembly), \$300 on the GEM, and another \$100 on the Hyper-tuning, and now I have a system that should provide a very stable, highly accurate platform for both visual and photographic use, and its GOTO technology should make its operation highly enjoyable. As soon as we get a couple of clear nights I'll let you know if all my work has paid off, but for now I give it two slightly bruised thumbs up! ●



April Elections

April is not only the cruelest month, it is also the month for electing the Lowbrow officers. (Is there a connection, we wonder?). Nominations for officers are normally received at the April meeting, and are then voted upon immediately, to keep the pain level low. If you would like to be an officer, any officer, you can find out if you qualify (are you breathing as you read this?) by talking to either Kathy Hillig or Charlie Nielsen. We need a few good Lowbrows, and perhaps you are the very one to fill that awkward gap left by departing officers. All offices are up for grabs, and the pleasure of being able to tell your friends that you were elected to an office should easily outweigh any of the slight inconveniences involved in actually performing the officer's duties. We hope you will attend, we hope you will run, we hope you will vote, we hope you will serve. ●

Nominations:

President	Charlie Nielsen
V.Pres.	Bobby "G"
V.Pres.	Paul Walkowski
V.Pres.	Jim Forrester
V.Pres.	Bernard Friberg
Treasurer	Kathy Hillig
O.D.	Bernard Friberg and D.C. Moons
Web.	Dave Snyder
Newsletter	John Ryan

University Lowbrow Astronomers

2004 Balance Sheet

Expenses

Telephone bills	\$11.95
	\$29.23
	\$29.23
	\$11.95
	\$11.95
	\$29.23
	\$11.95
	\$11.95
	\$11.95
Radwick - Observatory expenses	\$151.56
Hillig - stamps	\$7.40
Hillig - stamps	\$7.40
Fred Adams lecture fee	\$99.00
AA News ad	\$62.00
Int'l Dark sky Assoc.	\$100.00
GLAAC	\$65.00
GLAAC	\$200.00
Clear Sky Clock	\$52.00
Newsletter expenses	\$155.11
	\$157.40
	\$469.66
	\$351.56
RASC-calendars & OH	\$593.25
Total Expenses	\$2,630.73

Income

Dues @ \$20 (72)	\$1,440.00
Dues @ \$12 (23)	\$276.00
Donations	\$100.00
	\$5.00
	\$148.00
Swap meet profit	
Calendars & OH	\$840.00
Total Income	\$2,809.00

Adventures in Flocking

by Nathan Murphy

I recently flocked the tube of my 8" Orion XT. What is "flocking"? Flocking paper itself is nothing more than velvet or felt-like fuzzy stuff backed with paper. Some is self-adhesive, some not. I bought a roll of the non-self-adhesive stuff from Duchek Consulting Services. Flocking is simply the act of installing flocking paper.

At first, I was going to flock the entire tube, but two things kept me from trying this:

- 1) He would perform the flashlight test to dispel grumbling from shroud-lovers: An observer would look in the focuser tube, and have to state whether the flashlight (pointing obliquely into the tube) was on or off. Needless to say, they could not discern when it was on. Mr. Bartels referred to flocked wood-box dobos as Conestoga Wagons, a comparison I felt apt – what say you, John Causland? This leads me to think that maybe rather than go to the trouble of flocking an entire 4' tube, I should just flock the top and bottom.
- 2) Spray-on adhesive is cumbersome, messy, sticky, awful, wretched, evil and unfortunately, infinitely useful stuff. The less I had to deal with it, the better.

So, I flocked the inside of the tube opposite the focuser (about 8" in from the edge, half the circumference) and the entire tube about 8" up from the bottom (where the primary sits). If you want the gory play-by-play on my adventures with 3M spray adhesive, let me know...

Before the flocking, I stuck my head in the top of the tube and tried to block as much light coming in as I could, to see how "dark" the tube was. I noticed a faint glow coming up from around the primary cell. I believe this was reflected light scattered by the primary, as that end was resting on the carpet, and no light (more or less) should come up from there.

After I flocked it, the entire tube was dark - really dark. The flocking ate up all stray light reflected from the primary, and even the little bit of light coming in from around my head and arms covering the top of tube. Wow. Since I had both the primary cell and the spider/secondary assembly out of the tube, I figured I would blacken the edges of my mirrors. They do that for eyepiece lenses, so it couldn't hurt my mirrors. So the edges of both the secondary and primary are now black from a permanent marker. I've no idea if the blackened edge of the primary prevents light scatter down at the bottom, but now aligning the secondary and focuser are quite difficult, as the tube is very black, and the edge of the secondary is invisible against the flocking! Hopefully, this will translate to improved contrast at the eyepiece.

Observing from my front porch I noticed some interesting developments: I was looking at M81/M82 which involved pointing the scope just above an orange globe streetlight across from my house. This is typically very bad for night vision, and worse for galaxies. Without dark-adaptation and horrible seeing and transparency, I was able to get a dust lane in M82 with averted vision at 75x. Not a big deal, but considering the conditions, I was very surprised. At higher magnifications, it seemed that the sky was a bit darker than I was used to seeing in my eyepieces. So it seems, at first, that the contrast has improved - but a long night at Peach Mountain looking at the same objects that I saw at the 5 March open house will be the true before-and-after test.

As for scattered light rejection, when the scope was pointed just over the streetlight, there was orange light entering the tube at about 30° from the top, casting light over the top of the OTA and almost into the focuser tube. Ouch. That should ruin my image and nearly blind me, right? I looked in the eyepiece and there was no orange glow (other than the Ann Arbor skyglow on very un-transparent skies). I removed the eyepiece and looked down the drawtube, and there was no light coming in. The tube was totally dark.

Orion paints the inside of their dobsonian tubes flat black, but they still reflect a lot of light. By flocking the inside of the tube opposite the focuser, I've eliminated a considerable source of contrast-robbing reflected stray light. Flocking the bottom of the tube has prevented the stray light which comes from in front of or behind the primary from entering the focal path.

After doing some Cheshire tube collimation and checking my focuser/secondary alignment, I noticed that sometimes I get light coming up into my focuser tube. Tsk Tsk! The focuser has gone back to Moonlite Telescopes for a drawtube upgrade, and when it comes back, it will get flocking in the drawtube. ●

[We have received the following advertisement, but, inasmuch as it concerns a matter of deep and general interest, we feel fully justified in inserting it in our reading columns. We are confident that our conduct in this regard needs only explanation, not apology. —Ed, M. Twain.]

“How the Valley Wakens”

For well over 60 years the congregation of the Dexter United Methodist Church has gathered for Easter Sunrise on Peach Mountain, the highest point of land in Washtenaw County. It's the sight of the U of M telescope, a rugged little outcropping on an otherwise fairly flat Michigan landscape. Not a place for high heels and Easter bonnets, it was typically muddy and chilly in the early morning on Easter day. They were out there yesterday once again to greet the dawn while we shared our “Sunrise” inside!

From Peach Mountain you can see the chain of lakes and the Huron River in the valley below. Every year for the 10 years I was pastor there, I would remember a quotation from the Roman Catholic monk and writer Thomas Merton. I visited his monastery during my seminary years in Kentucky and know the landscape from which he writes. So I quoted him yesterday in the Sunrise Service. It's a beautiful paragraph for the beginning of any day, but especially the days of Easter:

“How the valley awakes. At 2:15 in the morning there are no sounds except in the monastery: the bells ring, the office of prayer begins. Outside, nothing, except perhaps a bullfrog saying “omm” in the creek. The first chirps of the waking birds mark the “point vierge” of the dawn under a sky as yet without real light, a movement of awe and inexpressible innocence, when the Father in perfect silence opens their eyes. They begin to speak to Him, not with fluent song, but with an awakening question that is their dawn state. They ask if it is time for them to “be”. He answers “yes”. Meanwhile, the most wonderful moment of the day is that when creation in its innocence asks permission to “be” once again, as it did on the first morning that ever was.” (Thomas Merton, “Conjectures of a Guilty Bystander”, page 130).

As they say, the only thing wrong with morning is that it always comes so early! But especially in the light of the empty tomb, the most wonderful moment of the day is when we ask permission to “be” for one more day. And the Father answers “Yes”.

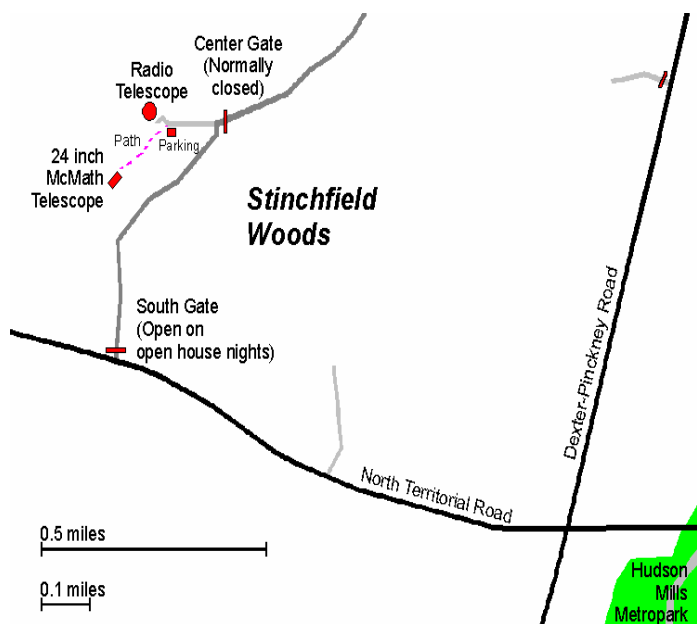
Good Morning!

Jack Harnish
Senior Pastor
First United Methodist Church ●



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 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
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Observatory Director:	Mike Radwick	(734) 453-3066
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	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/>



This is an image of Jupiter I took at the Open House at the UM Astronomy Club's "Peach Mountain" observing site (near Dexter) Saturday Night. The bright spot closest to the planet is Jupiter's Moon Io, the bright spot to the left is probably the star HIP-62688. Jupiter is the largest planet in the solar system, larger than all the other planets and moons combined. The bands you see on the disk are bands of clouds in its upper atmosphere.

Technical details:

Built by stacking around five hundred 1/5000 second images in K3CCDOPs, touchup done in JASC paintshop, photographed with an Atik 2HS "Astro-Webcam" on a Poncet-mounted 10" F6 Dobsonian/Newtonian.

David P. Tucker



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Check your membership expiration date on the mailing label.