

REFLECTIONS / REFRACTIONS

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University Lowbrow
Astronomers

March 2007

Volume 31 Issue 3

UNIVERSITY LOWBROW ASTRONOMERS REGULAR MEETING MINUTES OF 3-16-2007

1.) Officer nominations:

President: Charlie Nielsen

Vice President: Jim Forrester, Ken Cook, Mike Kurylo, At Large

Treasurer: Yasu Inugi

Observatory Director: D.C. Moons

Newsletter Editor: Mark Deprest

Webmaster: Dave Snyder

2.) Observatory: D.C Moons proposes worm replacement project for McMath telescope will commence in April and he will offer motion to general membership at regular meeting for approval of expenses.

3.) Meeting Topics and Speakers:

April: Elections and swap meet. (confirmed)

May: "The Worm Turns", D.C. Moons. (confirmed)

June: "Introduction to Astrophotography", Brian Ottum. (confirmed)

July: "New Equipment Show and Demo(?)", John Kirchoff, at Sherzer (EMU) Observatory. (confirmed)

August: Open

September: "Welcome to the Moon", D.C. Moons (confirmed)

October: Ken Bertin, subject not confirmed. (probable)

November: "Oki-Tex Star Party Report", speaker unknown. (proposed, needs V.P. follow-up)

December: "Artsy Meaningless Slide Show", Fred Schebor. (proposed, Charlie will inquire)

Saturday, April 21, 2007 is Astronomy Day

Sunday, April 22, 2007 is Earth Day

**The University Lowbrow Astronomers and The Ann Arbor
Hands-On-Museum**

Is hosting a Special Event to celebrate both from 10am to 4pm Saturday and
12pm to 4pm on Sunday at the Ann Arbor Hands-On-Museum

Additional events to be held at the Scheduled Open House at Peach Mt.

Saturday evening starting at Dusk

Important Club Info

- **Saturday, April 14, 2007** (Starting at Sunset). [Open House at Peach Mountain.](#)
- **Friday, April 20, 2007.** (7:30PM). [Monthly Club Meeting.](#)
- **Saturday, April 21, 2007.** (10:00AM to 4:00PM). Astronomy Day at the Ann Arbor Hands-On Museum. (It is hosted by the Ann Arbor Hands-On Museum and the University Lowbrow Astronomers).
- **Saturday, April 21, 2007** (Dusk to Midnight). Astronomy Day at Peach Mountain Observatory. (It is hosted by the Ann Arbor Hands-On Museum and the University Lowbrow Astronomers. This event will be similar to open houses at Peach Mountain, for more information see [Open Houses at Peach Mountain.](#))
- **Sunday, April 22, 2007.** (12:00 Noon to 4:00PM). Astronomy Day at the Ann Arbor Hands-On Museum. (It is hosted by the Ann Arbor Hands-On Museum and the University Lowbrow Astronomers).
- **Saturday, May 12, 2007.** *May be cancelled if it's cloudy.* (Starting at Sunset). [Open House at Peach Mountain.](#)
- **Friday, May 18, 2007.** (7:30PM). [Monthly Club Meeting.](#)
- **Saturday, May 19, 2007.** *May be cancelled if it's cloudy.* (Starting at Sunset). [Open House at Peach Mountain.](#)

University Lowbrow Astronomers 2006 Balance Sheet
Submitted by K. Hillig
Expenses
Income

Telephone bills @\$11.95/month	\$143.40	Dues @ \$20 (60)	\$1,200.00
		Dues @ \$12 (28)	\$336.00
Int'l Dark Sky Assoc.	\$100.00	Dues @ \$5 (2)	\$10.00
GLAAC - donation for expenses	\$250.00	Printed Newsletter (6)	\$72.00
- printing flyers	\$42.40		
Clear Sky Clock	\$52.00	Advanced dues	\$25.00
Hillig - stamps & postage	\$18.00	Donations	\$27.00
Newsletter expenses - stamps	\$15.60	(for GLAAC flyers)	\$50.00
RASC-Calendar & OH	\$764.15	Calendars & OH	\$1,069.00
Tee-shirt printing	\$1,149.89	[still to be collected]	-\$140.00
		Tee-shirts	\$1,807.00
Total Expenses	\$2,535.44		

Liabilities

Coulter Telescope re-build	\$1,200.00	Total Income	\$4,456.00
Worm gear replacement	\$1,500.00		

**Current account balance
(3/26/2007)**
\$6,720.56

New Equipment Review – William Optics Zenithstar 66 SD:

By Clayton W. Kessler

Seven Sisters Observatory – Manchester Michigan

February 2007

Some of the clouds lately have been my fault. At the FAAC Swap and Shop I took delivery of a small APO refractor made by William Optics – the Zenithstar 66 SD. For the last several weeks I have been using it as an astrograph in concert with my modified Canon 10D DSLR. I can honestly say that I have never owned a better behaved little scope! *Product photo from manufacturers web site*



This is an interesting little scope that uses an ED glass doublet to achieve very good color correction. I suspect it has a big following with owners of large Meade and Celestron SCT's as a very high quality finder – it is available in Meade blue and Celestron Orange and has SCT style threads as an attachment on the focuser. This is kind of nice as you can use your SCT accessories with this little scope. The scope is a 66mm f5.9 scope providing 388mm FL. The doublet uses an FLP51 glass element as the ED element and the color correction is very good to my eye.

I was able to easily mount the scope on a tripod and look through it on the evening that I brought it home. Weather conditions were not the best but a star test

showed good round diffraction rings on either side of focus. Saturn was sharp and color free on the edges. The most impressive thing about this first look was the very tight star images. Several moons of Saturn were visible as very tiny specks around the planet.

A week or so of poor weather followed and I was unable to do more than look at “stuff” in the house. With a 2” SCT diagonal this scope becomes sort of a long distance microscope able to focus to about 12 feet away. Images were again very clear and free of color fringing. I was becoming very happy with this little gem.

Speaking of gems – I should mention the fit and finish of this scope. It has a retracting lens shade that brings the scope length from 14.2” to a very transportable 11.8”. It comes equipped with a 1.6” crayford style focuser that features a 10:1 speed reducer on one side. The focuser also rotates to aid in composing a photograph and has a focus lock and a tension control. The focuser is butter smooth and easy to use. The focus tube has an etched distance scale to aid in rough focusing a camera. The anodizing of the tube and focuser is second to none! The scope is hefty for its size and everything about it screams quality.

Lens coatings are the WO “STM” full multi-coating and the glass just seems to disappear when you look directly at it. There are 10 baffles in the tube that is really a single piece with pointed areas on it's inside diameter. It seems to do the job so far. The focuser has a built in heavy duty bracket for attachment to a tripod. The included 1.25” adapter has a nice brass compression ring to hold eyepieces and such. The scope even comes packaged in a nice aluminum case with extra room for accessories and eyepieces. The best part.... All this for \$299.00!!!!

Now – all you guys know that I seldom LOOK through a telescope preferring to hook up a camera and take

astrophotos. Knowing I would be taking astrophotos I sprung for the .8 focal reducer / field flattener to assure that my DSLR would have nice sharp corners. In the last couple of weeks I was able to take the sub frames for three astrophotos through this scope. All were taken with my modified Canon 10D, on my G11 and guided by my ST4.



The first shot is old faithful M42. I took 6 five minute exposures for the main part of the shot and I "feathered" in several shorter series of exposures to eliminate the burned out area around the trapezium.

The next target a week or so later was M45. I took 9 three minute exposures and 4 five minute exposures with 2 three minute dark frames and 2 five minute dark frames. Deep Sky Stacker combined the images and my old copy of Photoshop 4 took care of the final tweaks. I have had a lot of trouble shooting M45 and getting the detail that I know is there. I was very happy to see how this little scope handled this cluster.



The same night I moved the scope over to NGC1499 and shot 11 five minute exposures and combined them with 2 five minute dark frames. I am pretty happy with the result as I think I got a LOT more detail than my best film shot of this object.



All in all I am thrilled with the performance of my first APO. I can hardly wait to try the Rosette with this scope and M31 should easily fit the FOV. I am looking forward to the summer milky way when I can shoot the North America Nebula, the Lagoon and all the nebulosity around Antares.

I can recommend this scope without reservations to anyone that wants a small high quality APO refractor. If you want to look at one come on out the Seven Sisters Observatory in Manchester some clear evening or head on over the Riders Hobby Shop in Livonia. John Kirchoff keeps a sample in stock there. I must admit it is rather nice to be able to buy a scope like this locally!

I am sold on APO's. They really make it easy to take some pretty good astrophotos. Now I need to save my pennies for a 90mm APO.... Hmmmmm... they even make a 132mm version.....

Obsession Refit: Powering a Truss-Tube Telescope

By Robert Wade

I took delivery of my 20" Obsession (#369: all Obsessions have a serial number) in February of 1998. It was my last big splurge before my oldest was due to go to college, soon to be followed by her sister. Back then it was a plain unpowered system, about what I could afford at the time. I hadn't even invested in any good eyepieces. I soon realized that the cheap Kellner's I used in my venerable Coulter Odyssey 1 (13.1") were not even close to taking advantage of the scopes' capabilities. TeleVue hand grenades were the first upgrade. Over the years and after attending numerous national star parties and seeing how the truly Obsessed observe, I've tended to upgrade my equipment to make observing a more rewarding and convenient hobby.

This time around (Christmas 2006) I was searching for a more elegant and simplified way to route power to the UTA (upper tube assembly). I had learned on the west side of the state that observing in Michigan dictated some type of dew removal system to enjoy more than a little observing on any clear (and humid) night. Typically the controller part of dew removers are installed on the UTA (upper tube assembly: upper left in Figure 1) so attached cords can be easily routed to the eyepiece, finder scope, secondary, etc. I invested in the standard Kendrick Dew Controller (their older, non-microprocessor version). This has a long power cord terminated in a male cigarette-lighter connector intended to be plugged into the power inlet provided on many 12VDC batteries used by amateur astronomers. I typically wrapped the cord around and around the truss poles and down to the front of the mirror box where I had a small 12VDC battery suspended in a wire bracket. This worked for me for years, but the battery did not have great capacity and I didn't like the aesthetics of cords dangling around the scope, even if they were covered by the telescope shroud.

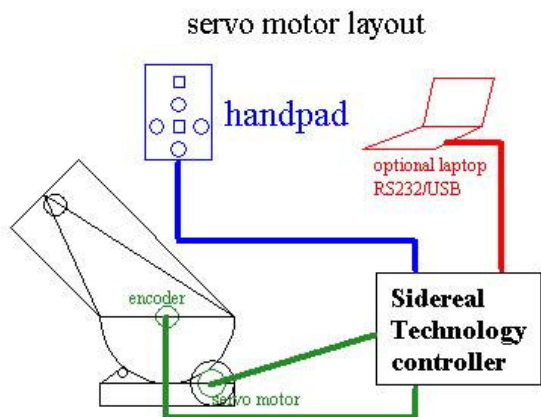


Figure 1: CAT Schematic

During Obsession Refit #1, I finally upgraded to the ServoCAT Track/GOTO telescope system marketed by Gary Myers, as well as adding a PC support

table and DSC "stalk" to hold the Argo-Navis. These add-ons were provided by Charlie Starks of Markless Astronomics (see Figure 2). This brought a whole new dimension to my observing. Firstly, since the scope now tracked objects, I could enjoy the benefits of large aperture and high power and study faint fuzzies under various magnifications without constantly adjusting the moving field of view. Secondly, since I wasn't getting any younger I wanted to spend less time finding objects (on nights that it was moonless and clear) contained in the Herschel 400 and Herschel II observing lists and spend more time studying them. Lastly, an attached PC let me use SkyTools (sorry Guide fans) to plan my observing session, control the ServoCAT, and then log the object after I had studied it.

Figure 2: Robert Wade and Dave Kriege at Okie-Tex 2006



The problem with all this added electronic equipment is the significantly increased demand for more juice from the battery. So, I upgraded capacity to a 115-amp hour deep-cycle marine battery (well, this was meant to last a few nights without recharge) that would plug into the new circular ground board (see Figures 3-5) which replaced the original triangular board. To drive the scope in azimuth, a servo was installed on the inside of the rocker box and a drive gear pro-

trudes down through a hole and, when engaged, rotates the rocker box and hence whole telescope around the circumference of the ground board. The fluorescent orange paint on one of the three ground board feet indicates which foot has the power receptacle. The metal plate you see in Figure 3 is the surface for the negative (-) part of the circuit which is wired from beneath (see Figure 4).



Figure 3: Upper Surface of the Ground Board

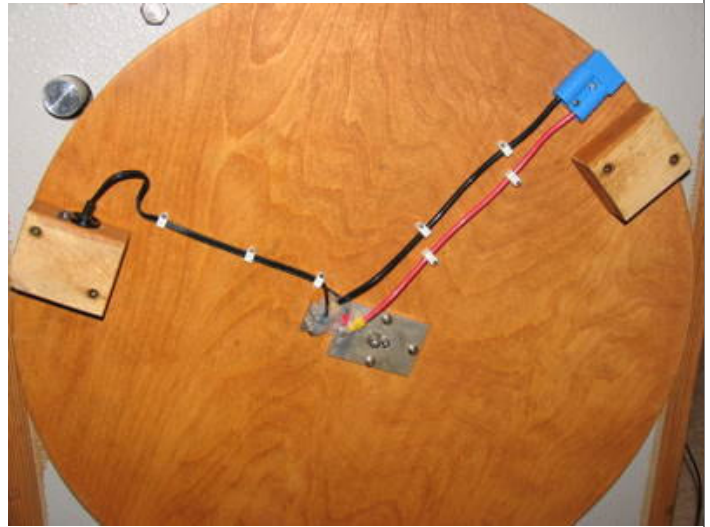


Figure 4: Lower Surface of Ground Board



Figure 5: Powered Ground Board Foot Detail

When I am in the field and remote from live AC current, I use the 12VDC plugged into the foot shown on the left in Figure 4, and close up in Figure 5. When I'm observing at a site where AC is available, I utilize a 15VDC power supply and plug into the Anderson Power Pole quick-connector (blue) shown in the upper right of Figure 4. You can also see how the circuit is split on the ground board: negative is transmitted through the board to the plate seen in Figure 3; positive is routed through the central pivot that is also attached to the azimuth encoder. The advantage to this solution is that your telescope can rotate freely without cords becoming entangled since the cord is connected to a stationary ground board.

Figure 6:



Ground Board Electrical Hardware

Figure 7:



Rocker Box; Azimuth Encoder,
(+) and (-) Terminals

Figure 8:



Rocker Box Showing Power Panel

The rocker box holds all the wiring, the power distribution panel, and servo motors and encoders (Figures 6-8). The cylinder shown in Figure 6 is conductive and is attached to the azimuth encoder (Figure 7). The two-pronged metallic piece at the top of Figure 6 is the conductive path for the negative terminal. Two holes are drilled through the rocker box for the spring-loaded contacts, which are in constant contact with the plate shown in Figure 3. The negative path is enabled by an “E” ring clip surrounding the central pivot. This is also spring-loaded to ensure the circuit is maintained.



Figure 9: Power Supply Enclosure and Connections

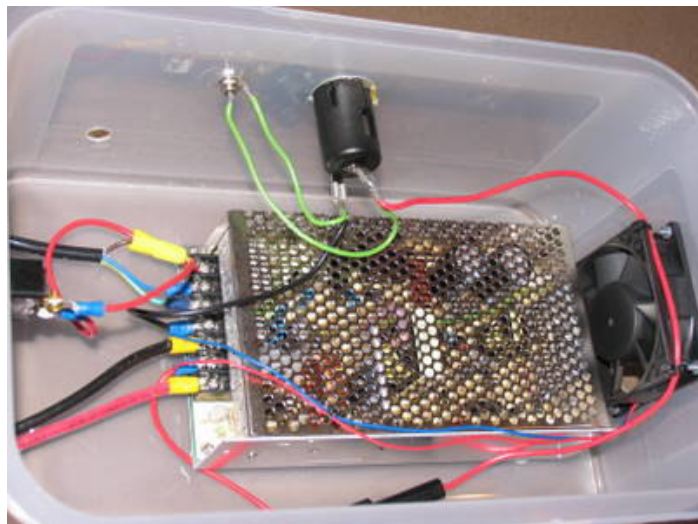


Figure 10: Power Supply Box Internals

Figures 9 and 10 show the 15VDC power supply in an enclosed plastic box that was obtained from Wal-Mart. I got the idea from Skip Copp at BFSP last year. We utilize 15VDC instead of 12 VDC due to the voltage drop from the power supply to the UTA. I originally used a 12VDC power supply, but with all the gear drawing power, every time the PC hard drive engaged there was a noticeable performance drop in the system. Supplying just a little more voltage through #8AWG wires to the telescope solved that problem. I also attached another cigarette lighter and RCA receptacle to the box to power my 12VDC heated beverage cup for use on those chill nights.

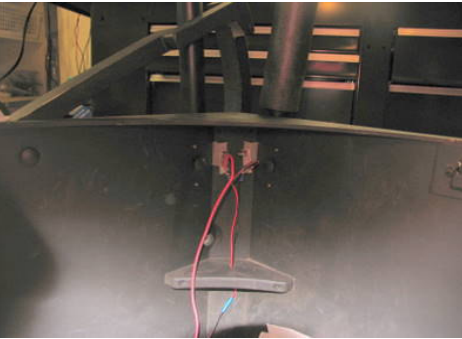


Figure 11: Powered Truss System Terminals

So at this stage, how did I get power to the UTA? The answer was fairly simple if not completely elegant. I ran an extension from the power panel to the inside front of the rocker box. I then drilled the box and attached an RCA plug on the outside. For the truss tube carrying power, I attached two RCA plugs at either end of the tube and ran wire through the inside of the tube to carry the (+) path. The truss tube itself, being aluminum, carried the (-) path. This then needed a flexible patch cable to connect the truss tube with the connector in the rocker box. More connections – more power loss. This circuit was fused to prevent cross polarity and protect the dew controller in event of an electrical short. Oh – did I neglect to mention that I initially forgot to fuse protect this circuit? Down at WSP 2005 one dewy night led to some type of short that completely fried the Kendrick dew controller. Silly \$100 mistake since I then “upgraded” to a 1000 Oaks dew controller.

I was fairly content with this setup for a year or so, but still didn't like the patch cord down below with its potential to bind during an altitude slew. So I was pleasantly surprised to hear from Charlie Starks that he had solved the problem in a completely elegant way – utilize two truss tubes, one for (+), one for (-) and make it “plug and play.” See figures 11-14. A copper-beryllium strip was designed to take advantage of a natural cavity the Dave Kriege had designed into his

Figure 12:



Leads from Power Panel to Trusses

Figure 13:



Truss Block Removed to Show Electrical Tab

Figure 14:



Electrical Tab in Truss Block

truss tube blocks. Charlie devised a template to drill through the mirror box, insert the terminals, and reattach the block. That left a connector much like used in a battery powered flashlight. Merely inserting the truss tube automatically provides a path for the circuit, no exposed wires anywhere.

Figure 15:



Powered Trusses Carrying Power to UTA

Figure 16:



UTA Terminal (RCA Plug)

Figure 17:



UTA (+) Terminal

The pole seats on the UTA were drilled through with a conductive bolt and a terminal attached on the top side of the lower UTA ring (see Figures 16-18). This of course means that two poles carry each charge. The (+) pole is opposite the eyepiece and it travels 90° around the UTA and joins with the (-) pole. An RCA plug then provides a terminal for the highly shortened Thousand Oaks controller. Yes, this system has an inline fuse down in the rocker box to prevent circuit overloads.

Figure 18: UTA Power Panel

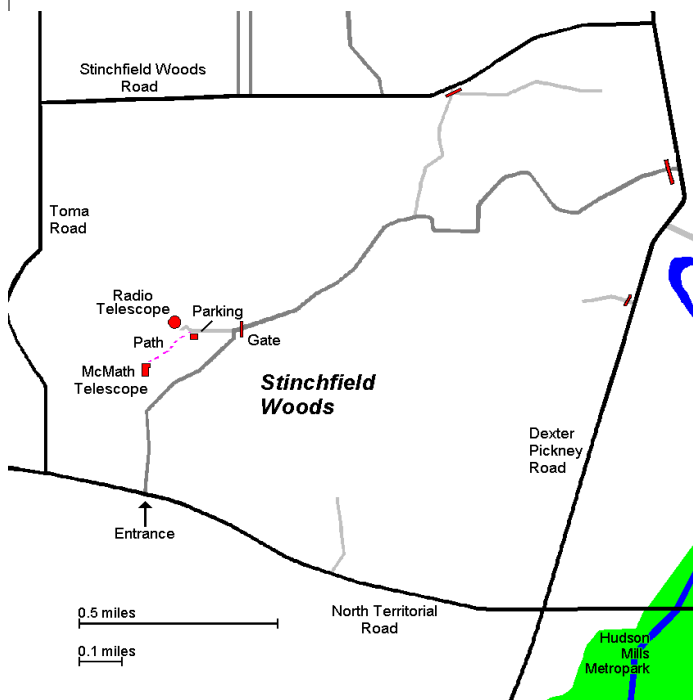
With this system and ~13.8 VDC supplied to the telescope, there is never any shortage of power with the PC humming along and the ServoCAT, dew heater, mirror fan, and ArgoNavis all drawing at the same time.



Places & Times

Dennison Hall, also known as The University of Michigan's Physics & Astronomy building, is the site of the monthly meeting of the University Lowbrow Astronomers. Dennison Hall can be found on Church Street about one block north of South University Avenue in Ann Arbor, MI. The meetings are usually held in room 130, and on the 3rd Friday of each month at 7:30 pm. During the summer months and when weather permits, a club observing session at the Peach Mountain Observatory 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" telescope which is maintained and operated by the Lowbrows. The observatory is located northwest of Dexter, MI; the entrance is on North Territorial Rd. 1.1 miles west of Dexter-Pinckney Rd. A small maize & blue sign on the north side of the road marks the gate. Follow the gravel road to the top of the hill and a parking area near the radio telescopes, then walk along the path between the two fenced in areas (about 300 feet) to reach the McMath telescope building.



Public Open House / Star Parties

Public Open Houses / Star Parties are generally held on the Saturdays before and after the New Moon at the Peach Mountain observatory, but are usually cancelled if the sky is cloudy at sunset or the temperature is below 10 degrees F. For the most up to date info on the Open House / Star Party status call: (734)332-9132. Many members bring their telescope to share with the public and visitors are welcome to do the same. Peach Mountain is home to millions of hungry mosquitoes, so apply bug repellent, and it can get rather cold at night, please dress accordingly.

Membership

Membership dues in the University Lowbrow Astronomers are \$20 per year for individuals or families, \$12 per year for students and seniors (age 55+) and \$5 if you live outside of the Lower Peninsula of Michigan.

This entitles you to the access to our monthly Newsletters on-line at our website and use of the 24" McMath telescope (after some training).

A hard copy of the Newsletter can be obtained with an additional \$12 annual fee to cover printing and postage. Dues can be paid at the monthly meetings or by check made out to University Lowbrow Astronomers and mailed to:

**The University Lowbrow Astronomer c/o Kathy Hillig
7654 W. Ellsworth Road
Ann Arbor, MI 48103**

Membership in the Lowbrows can also get you a discount on these magazine subscriptions:

Sky & Telescope - \$32.95 / year

Astronomy - \$34.00 / year or \$60.00 for 2 years

For more information contact the club Treasurer. Members renewing their subscriptions are reminded to provide the renewal notice along with your check to the club Treasurer. Please make your check out to: "University Lowbrow Astronomers"

Newsletter Contributions

Members and (non-members) are encouraged to write about any astronomy related topic of interest. Call or Email the Newsletter Editor: **Mark S Deprest (734)223-0262** or msdeprest@comcast.net to discuss length and format. Announcements, articles and images are due by the 1st day of the month as publication is the 7th.

Telephone Numbers

- President: Charlie Nielsen (734) 747-6585
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- Nathan Murphy (734) 395-1043
- Kurt Hillig (734) 663-8699
- Bob Grusczyński (734) 461-1257
- Treasurer: Kathy Hillig (734) 663-8699
- Observatory Director: D. C. Moons (586) 254-9439
- Newsletter Editor: Mark S Deprest (734) 223-0262
- Key-holders: Bernard Friberg (734) 761-1875
- Fred Schebor (734) 426-2363
- Charlie Nielsen (734) 747-6585
- Mike Radwick (734) 453-3066
- Paul Walkowski (734) 662-0145
- Dave Snyder (734) 747-6537
- Webmaster

Lowbrow's Home Page

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

Email at:

Lowbrow-members@umich.edu

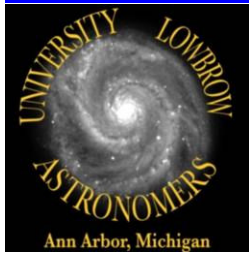


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Reflections & Refractions

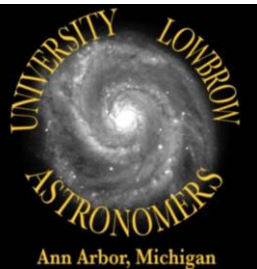


Website

www.umich.edu/~lowbrows/



Venus and the Moon by Doug Scobel.
Taken at Lake Hudson on March 20th 2007



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Check your membership expiration date on the mailing label