

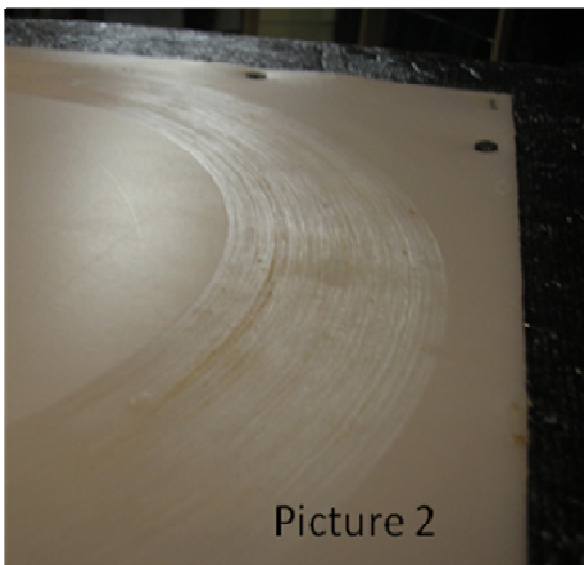
Test Dobsonian Conundrum or Return of the Coulter Parts Anomaly

By Jack Brisbin

During the last year myself, Doug Nelle and Tom Ryan worked on polishing and refiguring the clubs 17.5" Coulter mirror. We decide to star test the mirror, but to do this we needed a dobsonian telescope to test the mirror in. Not having one available, I took it upon myself to build a test Dobsonian with the old Coulter parts.

Before we go any farther we have to go back to the Coulter Rebuild Proposal that was developed by the Lowbrow ATM Group. This proposal includes a financial expenditure that was approved by the membership. This not the Coulter Rebuild Proposal, therefore there will be no expenses for a mirror cell, tube truss assembly, secondary mirror diagonal/holder. So how do you do this? This required a few visits to the ATM basement of stuff, Home Depot, Lowes and the local S&W Hardware in Plymouth. I started with a design that uses one sheet of 5/8 plywood for the mirror cell, mirror box and the secondary cage assembly. I then added the coulter rocker box, ground board, secondary mirror, diagonal holder and focuser and then proceeded to the ATM basement of stuff and mixed the ingredients, where the first test dob was birthed. This test Dob sits on a red dolly because the rocker box weights 85 pounds and the whole telescope with mirror tops 185 pounds.

I assembled and aligned the telescope in the garage and moved it around on the dolly and got it ready for star testing. (Picture 1) This is the telescope Tom Ryan referred to in his article "Things Fall Apart", March 2011 issue of Reflections and Refractions. The telescope Tom showed was the second rebirth, more about that later. This was the first star test we did and there was a major problem. When I rebuilt the rocker box azimuth bearing, I flipped the plastic sheet that was worn out and scarred, to the smooth side (reverse) this plastic is about 25 years old, it's the original. I didn't realize the plastic was breaking down. So as we continued to use the scope the rocker box started to stick and cause a stiff/jerky motion. Picture #2 shows the scarred surface of the plastic azimuth bearing material. The rocker box is assembled with 2 inch wire staples and they started coming apart. This added to the rocker box flexing. The force that it takes to move the rocker box is transferred to the truss poles made of 1"x 2" red oak. This caused the truss poles to flex (deformation). The rocker box was becoming an irritation.



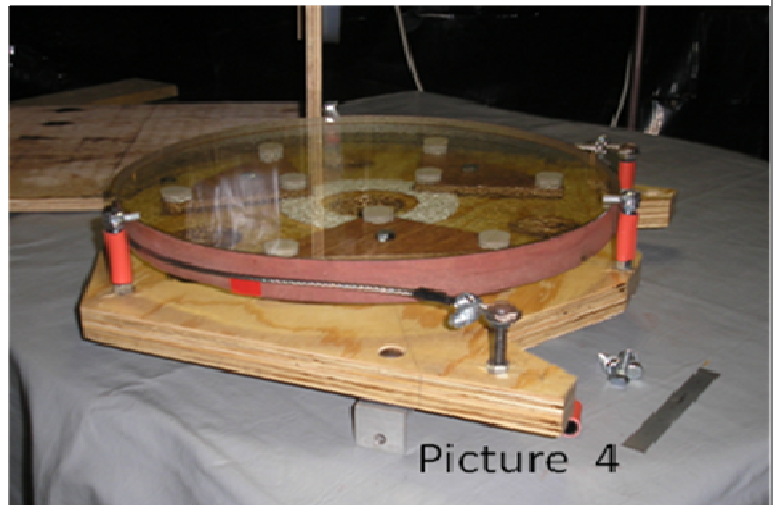
We did look at the Moon and Jupiter with the uncoated mirror and did some preliminary star testing but nothing positive because of the sky turbulence. It was getting cold and patches of clouds were beginning to show up and you know the rest. Back home, I took the tube assembly and rocker box down to the ATM basement of stuff or as my wife refers to it as "Cave #2". With implements of destruction I disassembled the rocker box into pieces and cut down the rocker box height to lower the eyepiece height of the telescope. The rocker box was reassembled with side supports that were screwed and glued to the rocker box. Two new front braces were added to strengthen and stiffen up the rocker box, screwed and glued. The azimuth bearing mess was completely replaced with Fiberglass Reinforced Panel (FRP) and pure Teflon pads. FRP is used on larger Dobs in the 18 inch to 40 inch range. Doug Nelle had a piece of FRP and donated it to the cause, thanks Doug! The altitude bearings were made of Teflon and UHMW plastic, one inch wide, this stuff is slippery but not as slick as Teflon. I wrapped this around the 10 inch side bearings using silicon glue and

small screws, more about this latter. In my basement I have a 5 ¼ inch I beam that has a one ton push dolly with a one ton chain hoist on it. The most I will ever lift is a couple hundred pounds so this will not cause any problems for the “I” beam, but it will save me from having back surgery in the long run, I hope.



Picture 3

Picture #3 shows the rocker box with side supports and front braces and ground board. This weights about 65 pounds instead of 85 pounds and a lot stronger. The mirror cell (picture 4) was made of two pieces of 5/8 plywood glued together. A wire sling made of 3/16th cable is used to hold the mirror at its center of gravity. The mirror clips and bolts have rubber tubing covering them so they do not damage the mirror during transportation. The 17.5” mirror and mirror cell were tested together with a ronchi test to make sure the mirror cell/cable sling did not cause any astigmatism. The mirror box and secondary cage were attached together with 1” x 2” red oak (truss) and 3/8 bolts and T-nuts.



Picture 4

The following picture (5) will give you a much better explanation of the tube assembly. With the mirror in, it weighs about 100 pounds.

The tube assembly is moved by the chain hoist, this allows me to test (up and down) the different Teflon combinations with the rocker box and side bearings



Picture 5

(tube assembly) to get a smoother movement and a better balance point. Reusing the Coulter parts does cause some design constraints. There are some problems with the secondary mirror and should not be used in the Coulter Rebuild Proposal. Read Tom Ryan’s article “Testing a Coulter Secondary Mirror” in the February 2011 Newsletter. The secondary mirror holder and diagonal holder have no adjustments; they go in one way and are aligned to the primary mirror in a specific way. The side bearings are too small for this size dobsonian. Published material

on dobsonian construction recommends a 24 inch half circle side bearing which I did not purchase, because this is not part of the Coulter Rebuild Proposal. We also have to take into consideration the finder scope and larger eyepieces. This is why the balance point is so critical. Some people would suggest adding 20 pounds of dead weight to the mirror cell to balance the scope better. I don't care for this, because now you move a 120 pound tube assembly and block some of the air circulation holes in the mirror cell that help the mirror cool down. I recently added a 90 mm computer fan to the back of the mirror cell to help cool down the mirror.

The fan runs on 8 AA batteries (12 volts) and the battery pack is attached to the mirror box with a metal clip. The fan is not designed to run on a battery pack. So you just cut off the motherboard plug and power unit plug and run the wires to the battery pack and it works; until the batteries are drained.

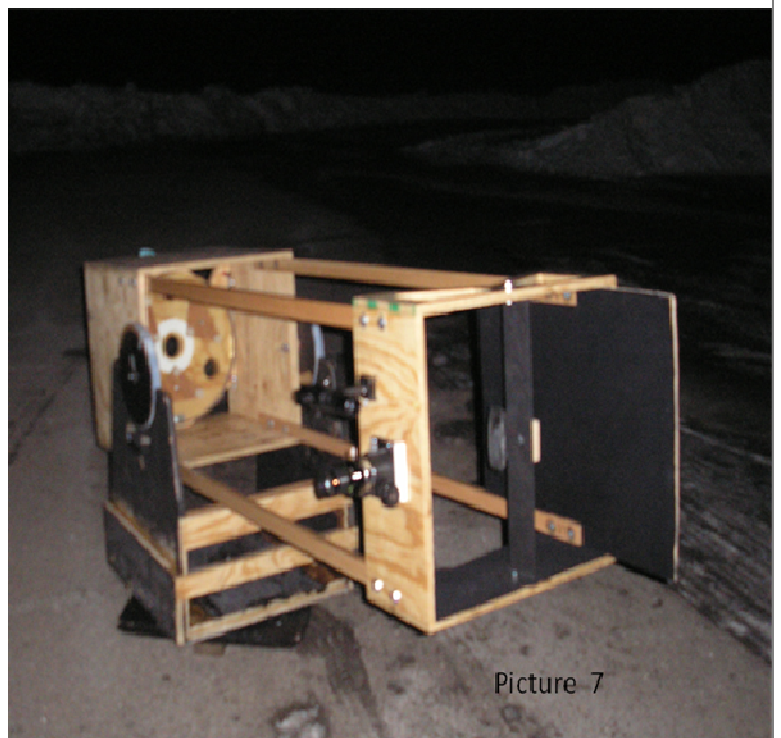


Picture 6

As you look at Picture 6 you will see the fan and battery pack. By now you have noticed the Blue Bunny Tail (BBT) that weighs about 4 pounds 12 ounces, this is soft weight used for exercising. The C clamp is attached to the top of the rocker box and lets the bunny tail swing freely which is the reason why this works. When the telescope is moved toward the horizon (down) the BBT load moves closer to the mirror box and exhibits less load. But when the telescope is moved toward the Zenith (up) the BBT load exhibits a greater load because the BBT is farther from the mirror box. This type of variable weight helps to compensate for the small side bearings. By now you are probably asking yourself why I didn't call this a Lowbrow Tail. Well I thought about it and decided to call it the Blue Bunny Tail. Those of you that attend the April elections can call for a club vote to change the name to; Lowbrow Tail.

The second star test was held at Leslie Park, Jack Brisbin, Tom Ryan and Doug Nelle. The telescope worked much better (picture 7) but the sky did not cooperate. I installed a light shield to block stray light into the focuser. Using a 3.5 mm type 6 Nagler eyepiece, we star tested on Polaris at 571 power, but the overhead sky turbulence left us with a boiling image. The night was a bust. We did look at Jupiter and M42 as the sky got cloudy. I was surprised at how much detail I could see in M42 with an uncoated mirror.

The question will be asked; should we continue to build a club telescope and save money by using the old coulter parts? The answer is NO! We should follow the Coulter Rebuild Proposal.



Picture 7

Astronomers Prove Discovery's Odometer Rolled Back

By Douglas Warshow

On March 9, 2011, the Space Shuttle orbiter Discovery landed at the Kennedy Space Center for the last time, ending its 26-year part in manned space flight. The final destination for the vehicle is still to be determined as many museums and institutes vie for the honor of housing this important item of space memorabilia.

The bidders, however, may want to rethink their final bids.

NASA officials had announced after the landing that Discovery had traveled in total "just under 149 million miles." But many amateur astronomers have observed that while the spacecraft was in orbit its orientation was completely opposite to its direction of travel. This is also known as retrograde motion.

"It really is amazing how far both optics and digital cameras have come in the last few years," commented Evan Feldman of Seattle, Washington. "You can even make out the Underwriter's Laboratory stamp on the Unity module of the International Space Station."

Another amateur astronomer, Gilbert Kronauer of Ann Arbor, Michigan, observed the shuttle through his modified Brownie camera which he had attached to a 50-millimeter Tasco refractor. Even from the top of Angell Hall, I could easily see the shuttle as it passed by the Michigan Nebula."

With many such observations of Discovery's retrograde motion, amateur astronomers have built a solid case for the deliberate sham of reversing the orbiter's odometer reading during portions of its flight. The true total mileage may be as great 484 million miles or roughly the same distance as that between the Sun and Jupiter. Many people have suggested that with fewer apparent miles on the vehicle, NASA could command a higher bidding price and help offset recent federal budget cuts to the agency.

Dr. T. Keith Glennan, first administrator of NASA and deceased since 1995, couldn't be reached for comment.



FOR SALE

**Low mileage sub-orbital Vehicle
Well maintained, Lots of cargo room!
Driven only as needed!**

(I think someone should check the Car-Fax)

Lowbrows Featured at Theme Semester

By Sandy Dugan

The University Lowbrow Astronomers mounted a unique presentation for "Water Discovery Day" at the University of Michigan Exhibit Museum of Natural History, Saturday, March 26, 2011. The all-day affair was a Family Event in the U-M College of Literature, Science, and the Arts Winter Theme Semester, entitled "Water." Several scores of visitors stopped at the Lowbrow exhibit, which showed why water is important to astronomers and how they look for it in the solar system and beyond.



Last fall, Amy Harris, Director of the Exhibit Museum invited the club President, Charlie Nielsen, to have the Lowbrows participate. During the winter, various ideas were tossed around at planning meetings, which included Charlie and club members Dave Snyder, Jim Forrester, Jack Brisbin, and Sandy and Betsy Dugan. Charlie wanted especially to show the importance of water by dissociating H₂O and producing oxygen for breathing and hydrogen for rocket fuel; liability concerns kept that idea lower down the list. With help from Warren Smith, Supervisor of the Physics Department Demonstration Laboratory, Charlie, Dave, Jim, and Jack devised two demonstrations: discovering water by spectrometry and making liquid water

boil away at low pressure, while Dave, Sandy, and Betsy worked on a poster display.

On the day of the event, Lowbrows found themselves to be one of a dozen special exhibits located throughout the museum. We set up on the third-level balcony, overlooking the dinosaur displays.

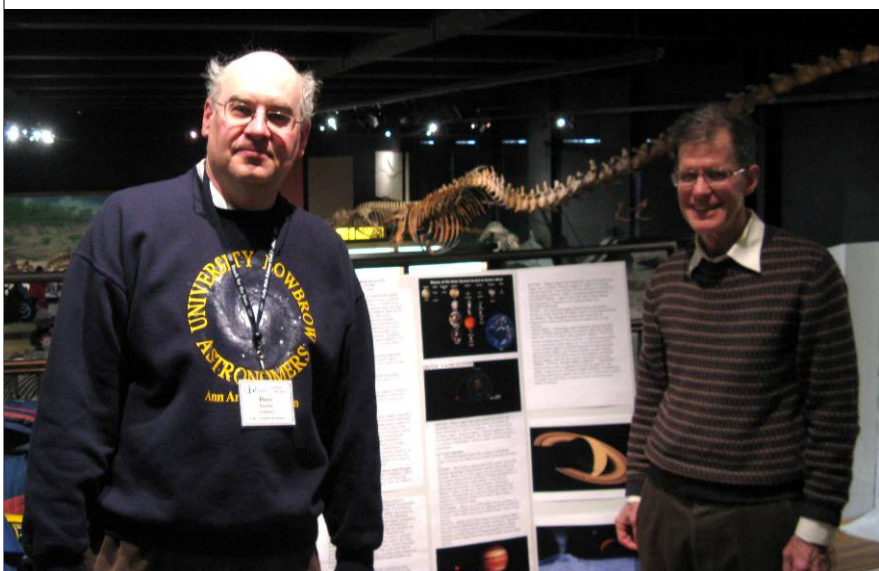
For the spectrometry demo, a 66 mm (?) telescope was fitted with a sensor in the focuser, with a fiber optic cable leading to a spectrometer, which was attached to a laptop computer; 50 feet away, spectrum tube boxes were plugged in; the tubes included water vapor, helium, and deuterium vapor; an incandescent light was also used as a black body radiation source. When a tube was turned on, the telescope picked up the spectrum of the excited gas, and the characteristic spectral lines were clearly displayed on the computer screen. Viewers saw an important method astronomers use to find water in the solar system and as far away as other galaxies.

For the boiling water demo, a clear thick lucite chamber with a removable lid was connected to an evacuation pump; about 10 cc of water was added to the chamber. With the lid on and the pump run-



ning, viewers clearly saw water bubbling at room temperature. It was easy to explain how liquid water on the surface of Mars would simply evaporate away, even at low temperatures.

The poster display, featuring notes by Dave Snyder and images of objects in the Solar System, showed how liquid water is rather rare, but H₂O in other states can be found from the sun (vapor in sunspots) all the way out to the Kuiper Belt and Ort Cloud (comets) and at many places in between. It was noted that spectrometry





shows water elsewhere in the Milky Way and in other galaxies.



During the day many friends showed their support, including Charlie's son, Charles, Sandy's wife, Betsy, and daughter, Anne, and club member John Causland. We may have missed a sunny day, but seeing the interest of the children and their parents was worth it. (Pictures courtesy of Anne Dugan)

Young Astronomers web site, Ann Arbor Schools

By Jack Brisbin

Background.

At the last astronomy program at Wines Elementary the 3rd 4th 5th graders seemed to like our program. This is also based on my involvement with last year's program. I asked Dave how hard it would be to set up an astronomy web site for 3rd 4th 5th grades targeting the Ann Arbor School schools. There is an Ann Arbor schools outreach coordinator that we work with. At this grade level this type of program has been working very well, according to the teachers and students (Voice of our Customer). As of this writing I'm not interested in High School or Junior High.

What would we put on a web site for 3rd 4th 5th grade students?

1. Link to stellarium to download to home computer (parents) or run from web site
2. Uncle Al star wheel if students want to make another or lose theirs
3. Article on how to buy a telescope geared toward our audience (parents)
4. Observing with binoculars
5. Major events, Ex; How to observe the Perseid meteor shower or lunar eclipse
6. How to find Peach Mountain and observing dates, times.

7. Abrams Sky Calendar could be used, buy a subscription I don't know about WEB rights.
8. The school science curriculum does include astronomy related instruction and some of this can be accessed by the students, we could link these sites or use some of their content.
9. Astronomy and Sky & Telescope are nice but not geared toward our audience. There may be other articles from magazines we could borrow.
10. We have to somehow keep this a fun astronomy site to go to, no Quantum Theory, Gamma Ray Bursters or String Theory.....Well.....err.....not to start with.
11. This is a web site for children, is there an issue of child security, do we monitor or not?



University Lowbrow Astronomers		2011 Balance Sheet (4/1/2010 - 3/31/2011)	
Expenses		Income	
Telephone bills @ \$11.95/month x 11	-\$131.45	Dues @ \$20 (58)	\$1,160.00
GLAAC AATB Donation (2010)	-\$300.00	Dues (senior) @ \$12 (39)	\$468.00
International Dark Sky Association, 3/2011	-\$100.00	Dues (student) @ \$12 (4)	\$48.00
Sat. Morning Physics	-\$100.00	Dues (oos) @ \$5 (7)	\$35.00
Events: Scherzer "Pizza Party"	-\$81.01	Donations	\$275.00
paper supplies	-\$66.54	T-shirt/sweatshirt income	\$348.12
Clear Sky Chart, 3/2011	-\$50.00	RASC Calendars & OH: net	\$100.20
**2010 T-shirt order (incl re-order)	-\$1,100.18		
David Levy honorarium, 1/2011	-\$300		
CGEM mount, Riders	-\$1,483		
McMath recoating	-\$975.90		
misc. hardware for telescopes	-\$193.59		
Total Expenses	-\$4,881.61	Total Income	\$2,434.32
		Previous Balance	
**T-shirt order details		(3/31/2010)	\$8,891.05
prototype and initial screens	\$65.41	Club expense	
original order, cost per item: \$8.00	\$623.73	pre-pays income: \$296	
re-order, cost per item \$6.84	\$205.09	pre-pays income: \$52.12	
NOTE: 24 t's for presenters, cost	\$192.00	Club expense, \$8.00/item	
inventory balance: 33 T-shirts			
		Current Balance	
		(3/31/2011)	\$7,207.64



Astronomy Day 2011

Saturday, May 7th

KALAMAZOO VALLEY MUSEUM

10 AM - 4 PM | 230 N. ROSE ST.

Solar Observing

View our star close up with safe solar filters (weather permitting).

Displays

Learn about the icy worlds of the outer solar system, Mercury, and the different types of amateur telescopes. Check out the best photographs of the night sky by members of the Kalamazoo Astronomical Society.

Hands-on Activities

Decorate a star or make a fan comet, constellation can and more.

Comet Making Presentations

Help build a comet and learn about their secret lives at the edge of the solar system. This participatory program is ideal for the whole family. *Presentations are at 11am & 3pm.*

Free Planetarium Shows

Showtimes are hourly from 1 - 3 pm. See our website for details.



Meet Dr. Mike Brown

Chat with Caltech astronomer Dr. Mike Brown and get his autograph. Copies of his book, *How I Killed Pluto and Why It Had It Coming*, will be available for purchase.

KALAMAZOO NATURE CENTER

7:00 PM | 7000 N. WESTNEDGE AVE.

Keynote Presentation by Dr. Mike Brown

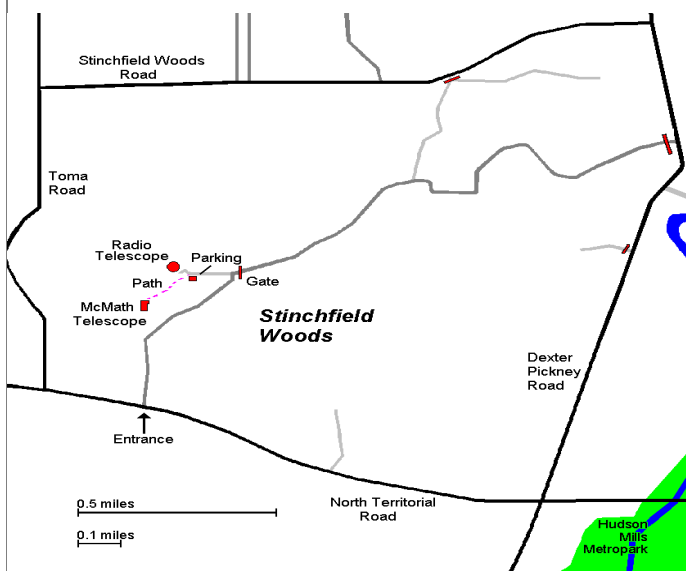
Dr. Brown tells the fascinating true story of the demise of Pluto and a first-hand account of the modern day discoveries of our solar system. **FREE** tickets will be available on May 7th at the museum starting at 11am. Tickets may be reserved with a small donation. See the Astronomy Day website for details. Seating begins at 6:30 pm.

Observe the Moon, Saturn, galaxies and more after the talk.

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)975-3248. 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 Astronomers
c/o Liz Calhoun
P.O. 4465
Ann Arbor, MI 48106**

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.

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Lowbrow's Home Page

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

Email at:

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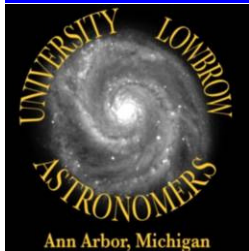


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Reflections & Refractions

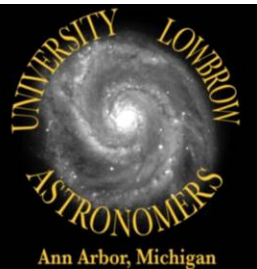


Lorna Simmons, at Saturday Morning Physics ... I came across this image of Lorna and it brought both a tear and a smile to my face.

I felt like sharing!

Website

www.umich.edu/~lowbrows/



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