University Lowbrow Astronomers
Ann Arbor, Michigan
REFLECTIONS / REFRACTIONS
University Lowbrow Astronomers
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A Backyard Observatory

Brian's Folly

By Brian F. Close, J.D., LL.M. M.A., T.N.*

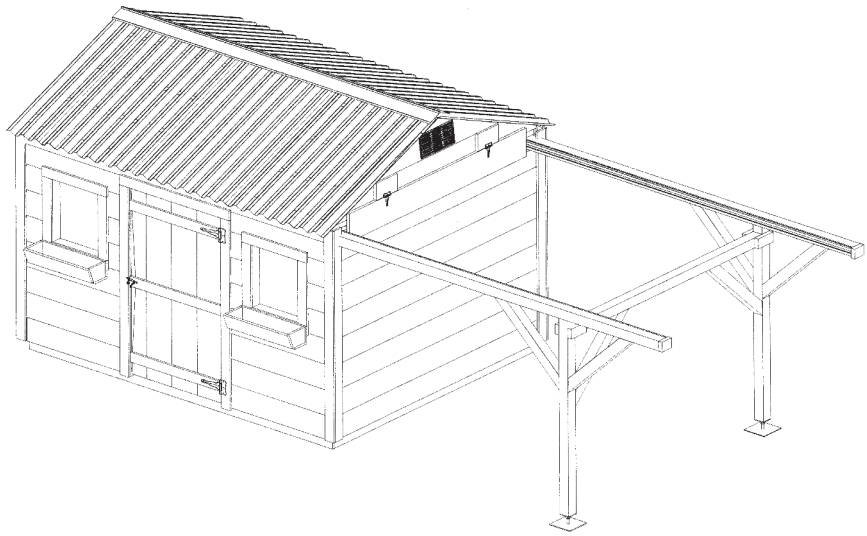
*Telescope Nut

Last year I had a health scare, so I decided to stop putting off some things. Less frugal, more fun!

The master plan is to build an observatory; mount the 12" f/6 mirror that Dan Joyce made for me (and is sitting in Tom Ryan's basement); and then spend $16,000 on the new AP900 Mount with absolute encoders.

So step one is the observatory.

Years ago I purchased the garden shed like Skyshed plans. These come in various configurations, all with roll off roofs.



A 12" f/6 is a pretty big scope. But a large Skyshed might run afoul of the local building code, which requires a permit for anything over 120 square feet. The solution? An 8' x 12' skyshed derived design with the following changes:

• The roof would roll south (I have a limited southern horizon; rolling north would also interfere with the garden and views from the house);

• The door would be on the north side (rather than on the west side), and offset to provide room on the north side for an observatory desk; and

• The east and west walls would fold down at the building mid-point, maximizing the swing through for the 12" f/6.

While folding down the east and west walls would let me put a big scope in a small building, it did complicate construction. Not only would the walls need to fold up and down, they'd have to come to rest the same place every time so that the rails would line up with the roof. Also, strong stable walls would be heavy, so a way to pull them up and down would have to be devised. Finally, "cutting the building in half" with the folding long walls could effect the structural integrity of the entire building.

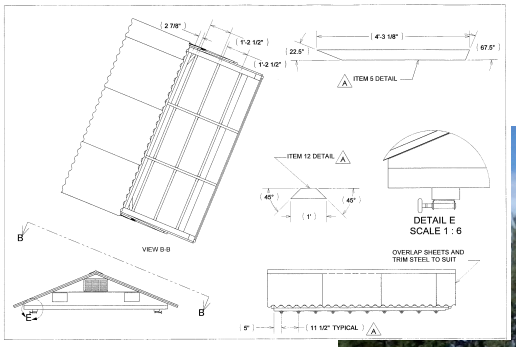
I presented these issues to my fix it guy, Dave Gentholts, who rips out walls in my house, etc. The solution he came up with was to stabilize the building by using a 4 x 4 post at each corner and plywood sheathing. These four posts and plywood tie together the framing for the entire structure so the folding walls are no longer a detriment.

Photos by the author

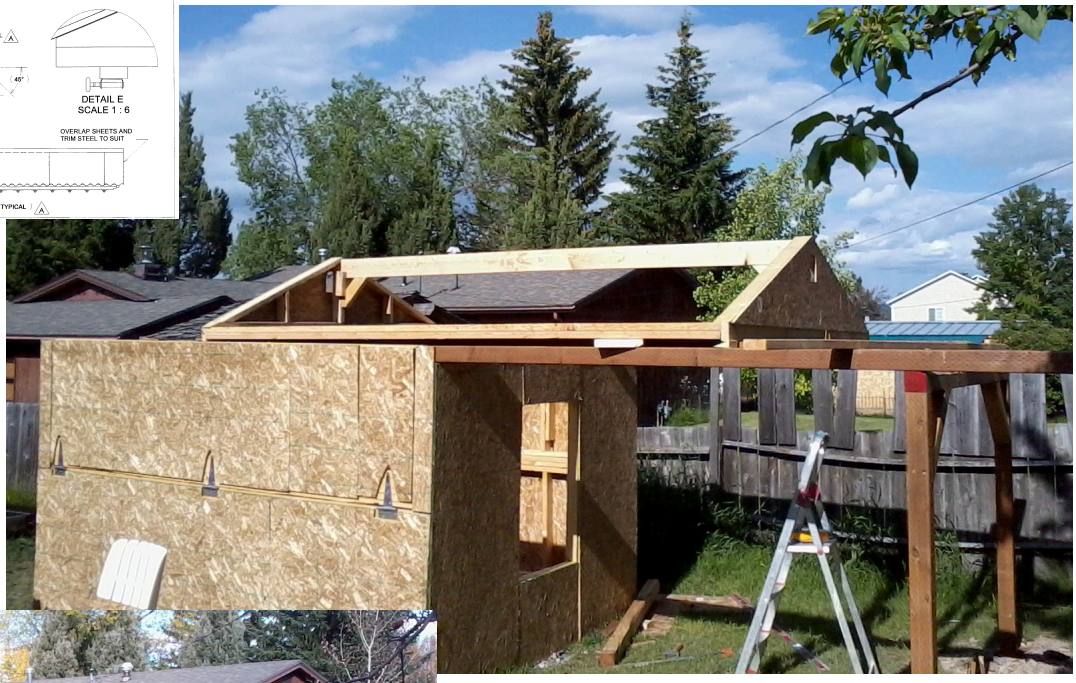
I also paid Dave to put in the gravel foundation, 16" concrete pier, and the first floor base structure. The cost, with labor and materials (which included all the framing lumber for the entire building) was $1500.

With drill in hand and a carpenter's square from Dave, I took on the rest of the construction. The wall design was all mine. Three heavy duty fence hinges, stop blocks, and slider bolts work to bring the each folding wall to a consistent closed position. Also imaged is the pulley and crank system to lower and raise the walls. Finally, the mid-line is protected with garage door runners.

The roof design was a combination of the 8 x 10 and 12 x 12 roll off designs from Skyshed.

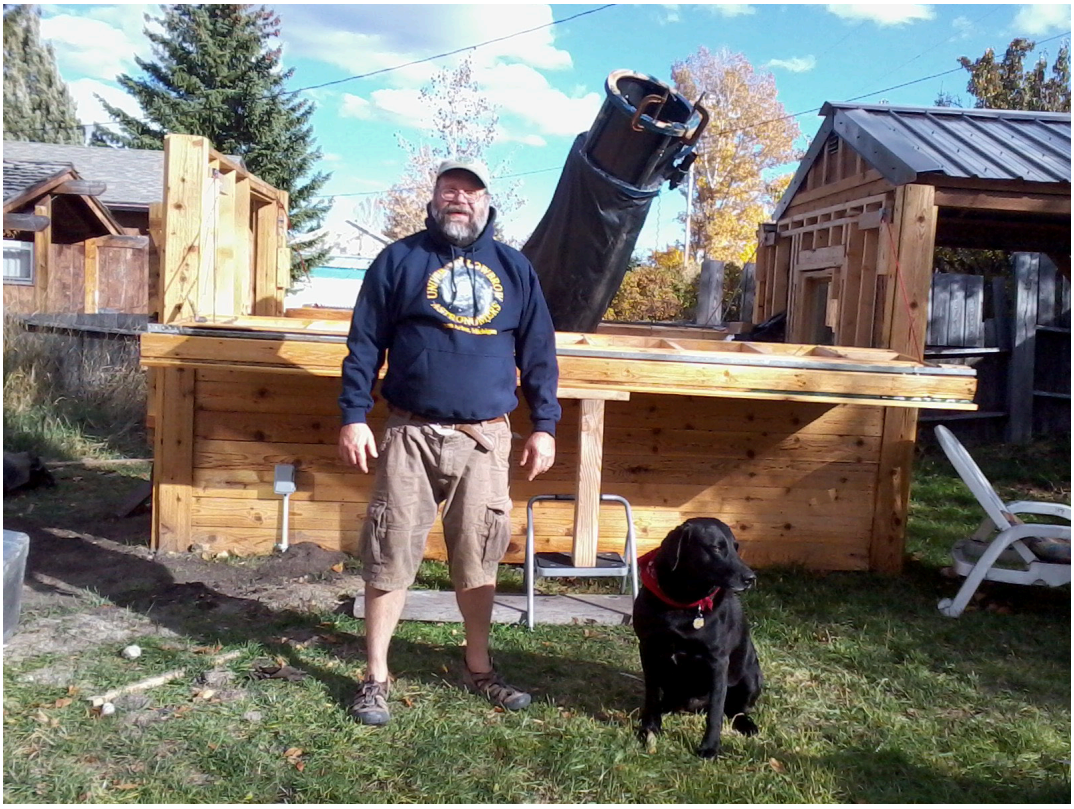


Starting at the end of June, two months later it was basically finished – exactly 3.14159 the time I thought it would take!. Total building cost was $3500 (cedar is not cheap!).



Observatory Closed

Observatory Open



Pending the 12" f/6 project, I have put the 16" f 4.8 dob in the building. (That's me with my bored astro-dog, Max(!))

Two short trenches to the house allow me to run power and ethernet to the observatory from the house's crawl space. When the AP 900 comes on line, I'll be able to run everything from the house – an important point since winter starts here in October and runs through May!

The view from above

Lowbrows Eclipsed in October!

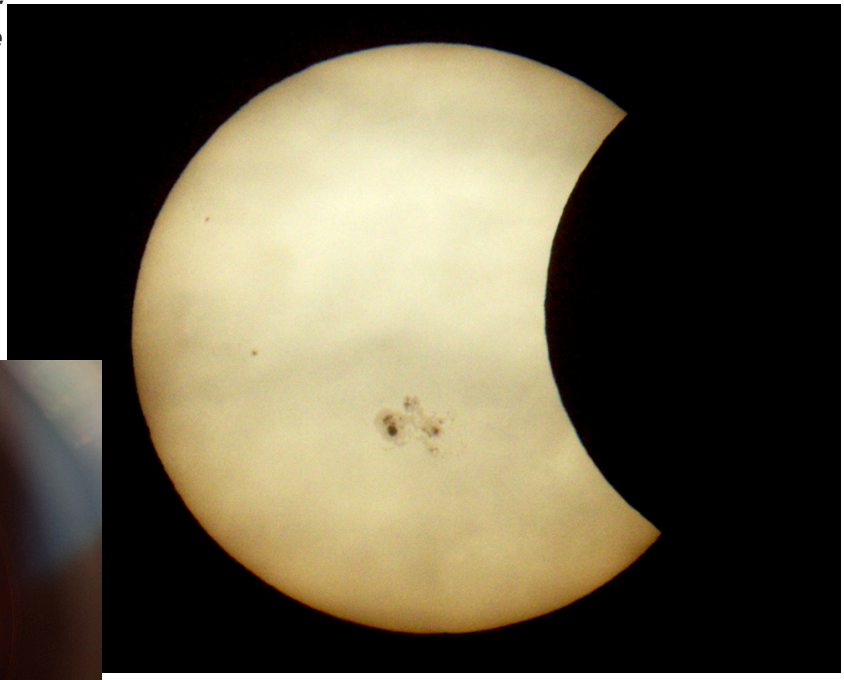
...Along With Most of North America

The unusual occurrence of both a total lunar eclipse and partial solar eclipse in the same month brought the Lowbrows out in force. The lunar event took place just before dawn October 8 in Ann Arbor, dampening any public outreach. But club members set up in advantageous spots around Washtenaw County and obtained terrific photos of the blood moon. The moon passed between us and the sun 15 days later at the sun set, creating a wonderful opportunity to set up solar filtered scopes in downtown Ann Arbor. Quite a bit of photography is available from the membership of both events, too much for one issue of Reflections to display. But if you don't see what you've submitted this month (or still have some pictures you haven't yet sent), the newsletter will be publishing more of your work in the future.--Editor

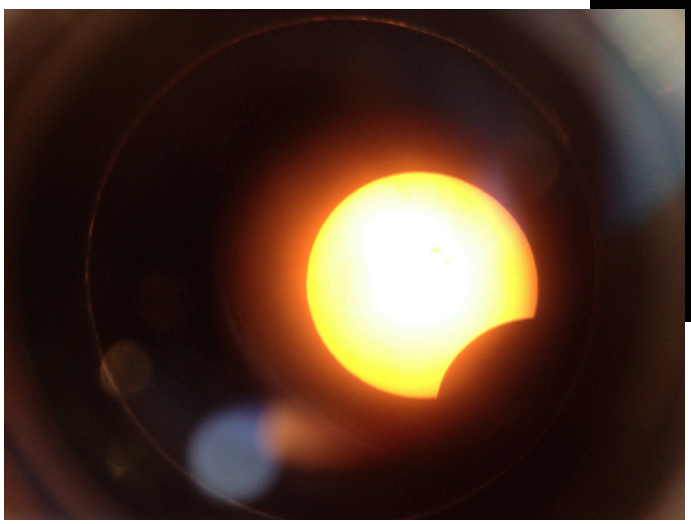
Nick and Doug Scobel set up in a soccer field not too far from their house near Saline. Above is Nick's work and to the right is Doug's.

"After much hand wringing trying to decide where we could go where we'd have a clear view of the western horizon, my son Nick and I discovered that there are soccer fields barely half a mile south of where we live. We set up there early Wednesday morning and took these shots. I verified later using Guide 9.0 and Sky-Safari that the bluish "star" to the lower left of the fully eclipsed moon is the planet Uranus!"

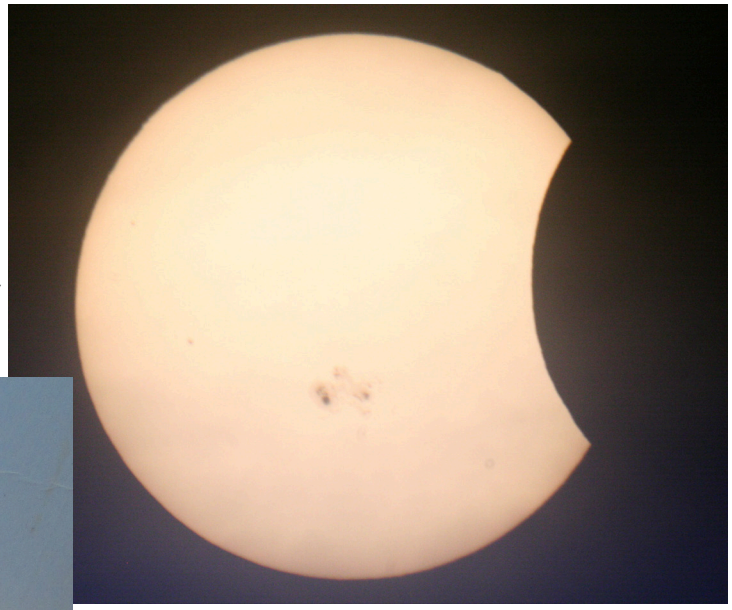
Peter Alway sent us this image of the October 23 solar eclipse: "I set up for the solar eclipse in a church parking lot facing a big farm field on Carpenter Road south of town: This is my least cloudy image."

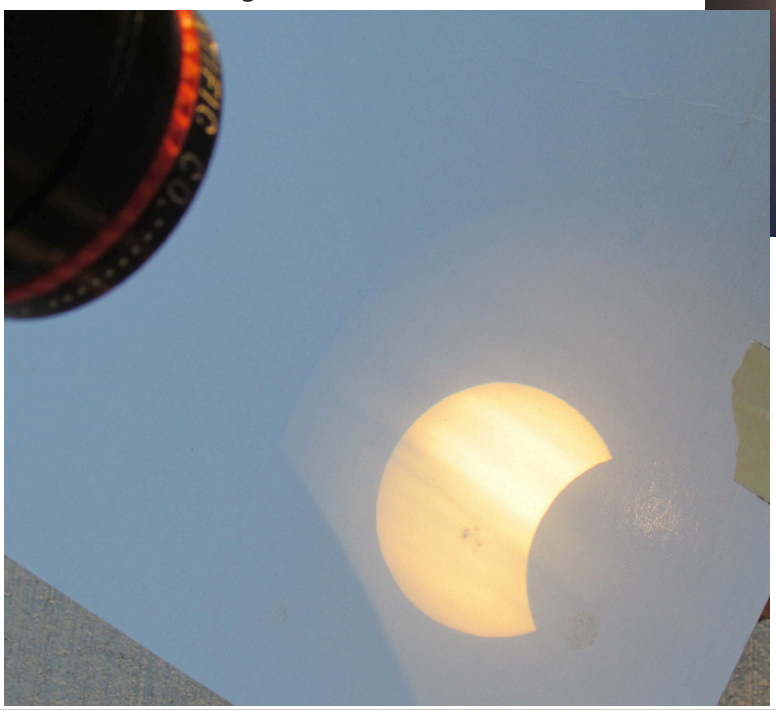


Below: George Ferrier put his tablet's camera up to the eyepiece of a telescope on Ashley Street and captured this view of the eclipse.



Right: Don Fohey gets this shot with a less than the best set up: "The Meade ETX-90 is hard to focus thru the camera viewfinder and seems to have a lot of stray light that reduces contrast." Your editor, though sees this as better than good effort.





Jim Abshier shows us a very nice image made with his small, home made telescope projecting onto a screen.

Lithium Polymer

LIPO Batteries for Telescopes

By Don Fohey

I have successfully used an 11.1volt LIPO battery to power my both my Mead ETX90 and my customized 10" Dobsonian where it powers the digital setting circle electronics, dew heaters and mirror cool down fan.

As telescopes have become more sophisticated they require electrical power most often provided by batteries. I have used a sealed 12 volt lead acid battery and I have notice others using similar batteries.

They are big and heavy, and I found it too heavy to place in the rocker box of my small Dobsonian. I ran a cable thru the rocker box, around the azimuth post and down thru the ground board to the battery some distance away. The cable was always a tripping hazard even when run under a ground cloth.

I use a 3 cell LIPO (Lithium Polymer) battery in my radio controlled electric powered model airplane. The battery is much smaller than the lead acid cells so I decided to try one with my telescopes. The first difference is 12 volt vs. 11.1 volts. Motors and fans typically will run at a lower voltage, with a little less toque and a little slower. Many electronics will regulate down the 12 volt to the 5 volts of the internal circuitry. The lower voltage doesn't seem to matter with my telescopes. There is no guarantee here, you must test it with your system.

The Mead ETX90 motors seemed to slew and track normally and the hand controller functioned. The typical sealed lead acid battery has a capacity of 7.5 to 10 Ampere hour (Ah). The LIPO I used has capacity of 2.2 Ah, other capacities are available. A typical 12 volt 1.4 watt dew heater will deliver 1.2 watts at 11 volts, you probably won't notice the difference. Three dew heaters requiring 0.1 Ampere each will run for about 7 hours with the 2.2 Ah battery.

LIPO batteries require special care! They can deliver an incredible amount of current. The one pictured is rated at 35C which is a sustained current 35 times its capacity. This battery can deliver 55 Amperes. They must be recharged with chargers designed specifically for them. All newer chargers provide for individual cell load balancers. The second battery connector in the photo is the cell balance connector. Overcharging a cell can cause a LIPO fire!. I always charge and transport the battery in the protective case. I store them in a metal box.

I am sure a LIPO battery is not a solution for everyone, but it may make observing more convenient for you.

Middle School Students "Schooled"

Ocotober 25 Open House

by Jack Brisbin

Tom Ryan making black holes clear to 11-13 year old children, their teacher and parents. ***Photo: Jack Brisbin***

As most of you know by know we had clear skies at the October 25 Open House and we had our Classroom Inauguration !!

There where about 40 people that showed plus club members with telescopes, Jim Forrester was the Open House Coordinator. This included 6 students and two teachers form Bloomfield Hills Middle School. I received a call Thursday Oct. 23 from one of the teachers if there was any classroom activity at the observatory and could we have some one talk about Space, Gravity ,Time Travel, and Black holes to the students. I sent out an e-mail Friday about this request and Tom Ryan agreed to do it. Thanks Tom.!!

Then came the issue of turning it into a classroom. I got there early at the observatory and rearranged the Observatory and pushed every thing toward the North wall and some clean up!. We kept the roof closed. The south wall has more room to do this and I brought some more folding chairs and presto!! We have a classroom!!

We had chairs for 2 teachers and 6 students and a chalk board for Tom. The presentation started about 6:20 PM and ended at 7:30 PM. By this time it was dark and we rolled back the roof and started observing. Mars was low on the horizon. John Wallbank brought a pair of large binoculars and showed students The Andromeda galaxy and some open clusters. John also helped run the 24" McMath. Thanks John !!. By this time more of the general public started to show up.

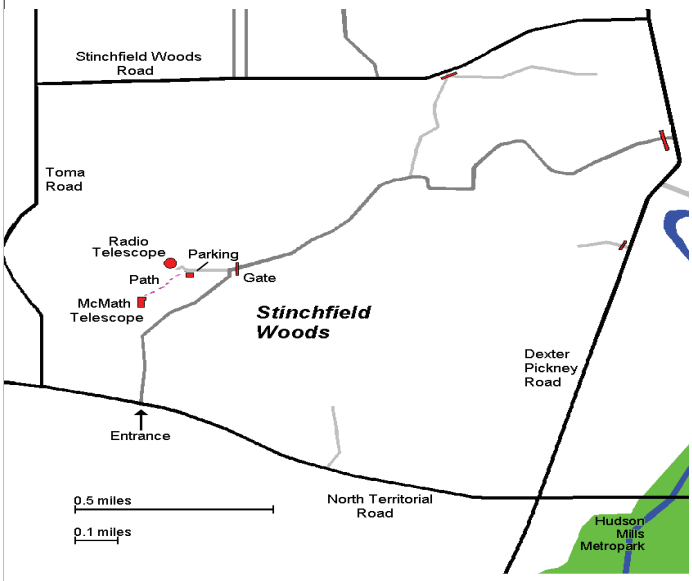
This classroom activity was made possible by the May 17th, Observatory Clean-up and re-allocation of the Observatory floor space and small room: Thanks to the club members that helped. I set up 8 chairs but we could get 12, maybe 15.

This was done, based on a two day notice and we did scramble. In the future, if we do this again we would need a more advanced notice and other club members that would be willing to be "teacher for an hour...or two"

Places & Times

Monthly meetings of the University Lowbrow Astronomers are held the third Friday of each month at 7:30 PM. The location is usually Angell Hall, ground floor, Room G115. Angell Hall is located on State Street on the University of Michigan Central Campus, between North University and South University Streets. The building entrance nearest Room G115 is the east facing door at the south end of Angell Hall. A club observing session at the Peach Mountain Observatory, weather permitting, often follows 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, maintained and operated by the Lowbrows. Located northwest of Dexter, MI; the entrance is off North Territorial Road, 1.1 miles west of Dexter-Pinckney Rd. A maize and blue sign marks the gate. Follow the gravel road to the top of the hill to a parking area south of the radio telescope, then walk About 100 yards along the path west of the fence to reach the McMath Observatory.



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 $30 per year for individuals or families, $20 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 $18 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

P.O. 131446

Ann Arbor, MI 48113

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

Sky & Telescope - $32.95 / year $62.95/2 years

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

For more information contact the club Treasurer at:

lowbrowdoug@gmail.com

Newsletter Contributions

Members and (non-members) are encouraged to write about any astronomy related topic of interest.

Call or Email the Newsletter Editor: **Jim Forrester (734) 663-1638 or** jim_forrester@hotmail.com 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

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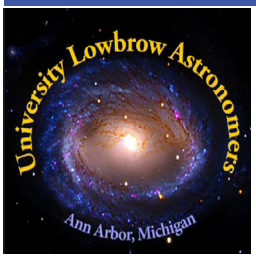
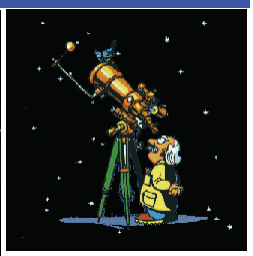
Reflections & Refractions





Website
www.umich.edu/~lowbrows/

Lowbrow Calendar

***Saturday, November 15*--Open House at Peach Mountain**--Open Houses begin at sunset, but may be cancelled if cloudy.

Friday, November 21, 7:30 PM*--Monthly Club Meeting**--Brian Ottum and Stan Watson (University Lowbrow Astronomers): "Live Observing Using a Remote Control Telescope -- A Demonstration." ***Room G115 Angell Hall, University of Michigan, 435 South State Street, Ann Arbor, Michigan (Note room change).

***Saturday, November 22*--Open House at Peach Mountain**--Open Houses begin at sunset, but may be cancelled if cloudy.

Sat, December 6, 10:30 AM–11:30 AM*--Saturday Morning Physics**--"Peering into the Atmospheres of Strange New Worlds." Emily Rauscher (U-M Astronomy) In the last 20 years over 1,500 planets have been discovered orbiting around nearby stars and most of these exoplanets are completely unlike anything in our solar system. Astronomers have developed incredible methods that allow us measure the atmospheric properties of some planets, giving us clues as to the physical conditions on these exotic worlds. Dr. Rauscher will discuss the current status and future of these grand endeavors. ***Rooms 170 & 182 Dennison Building, University of Michigan Central Campus, 500 Church Street, Ann Arbor, Michigan, 48109

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