

REFLECTIONS / REFRACTIONS

University Lowbrow
Astronomers

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April 2008

Volume 32 Issue 4

Lowbrow Annual Report 2007

It was a pretty active year for the University Lowbrow Astronomers. We did our usual monthly meetings and listened to a variety of speakers. In July we had our second annual meeting at EMU. This was because of a conflict with the Art Fair, and the convenience of having a place to hold the meeting in the event of bad weather. This time we actually had clear skies, enabling us to move some of the new toys John Kirchhoff brought along up to the roof to try them out. With this venue; easy parking, and serving pizza, cookies, and pop this has been a popular and well liked meeting and we plan to continue to do this. Thanks to Norb Vance for arranging our use of the facilities.

One of the big changes for the club last year was our joining the Night Sky Network. We have used several items from the toolkits that are sent to us to demonstrate various astronomic concepts to the public in an easy to show and understand format. We have not only used the resources at club meetings and open houses, but we have also held several events that featured the Night Sky Network program and toolkits. The first big event was our appearance for Astronomy Day at the Hands On Museum. This event went very well. We had an unusually warm day and we were able to view the Sun from the entrance area outside the building. Inside the buildings we had three tables set up for various demos and Mark Deprest and Yasu Inugi set up their portable planetariums and provided regularly schedules shows for the public. We did note a lot of strange animal like sounds emanating from Mark's dome. Just what was going on in there?

Later in the year (December) we did a similar event at the Exhibit Museum along side the U of M Student Astronomical Society. It was another big success with lots of people showing up. We also did NSN events at a local church to help some Cub Scouts earn merit badges. Last summer Mark Deprest asked for some one to take over as the main NSN coordinator due to time constraints. Mark did a fine job while he was doing this and we are grateful to him for that. A relatively new member, Belinda Lee took over the job and went crazy with it. She will be hard to keep up with, but I assure you NSN is in good hands.

Through a good portion of the year, especially the warmer months, our intrepid explorers, Yasu and Yumi, John Causland, and others were off exploring dark sky sites in northern Michigan and they found some. It seems the favorite, at least so far, is Tomahawk Lake. There will certainly be some trips up there this coming summer. The big star parties attended last year by many Lowbrows were the Great Lakes Star Gaze, Black Forest, and Okie-Tex. Good observing conditions were enjoyed at all three sites! Astronomy At The Beach was another success last year and we did get some clear skies in.

The McMath telescope has been down first for replacement of the worm that drives the RA axis, then the failure of the original drive electronics. The worm has been replaced, and the drive electronics are soon to be replaced completely with a design by Mike Radwick. We will also be replacing the very worn cabling going to the drive motors. Once this is all complete we must decide on and execute a plan to again recoat the mirror. After all this work we should be rewarded with a scope that is performing better than it has for many years, may ever.

That is it for my annual report. I probably will remember later some things I should have included in this report. Sorry about that, but fortunately I have a good lawyer.

Submitted by Charlie Nielsen, April 10, 2008

Cleaning the 17.5 Coultter Mirror at your local Quarter Car Wash

By Jack Brisbin

You are probably wondering why anyone would clean their telescope mirror at a car wash. The water from the high-pressure hose would strip the mirror coating off and probably damage the mirror surface. Well I really didn't clean the mirror that way. I just said that in the title of the article to grab your attention. It's similar to Shock and Awe Journalism. So how did I clean the mirror? To start with, I just used every day common products. I did not use acetone or alcohol. Now there are web sites that will tell you it's ok or they recommend acetone or alcohol. I'm not saying they are wrong, but it matters how dirty the mirror is. You can use different types of cleaners or a combination of cleaners, but that's probably a personal decision. Because of the age of the mirror coating and this is a rough guess of 15 years, the type of coating it is, I decided to stick with a combination of soap and distilled water.

Another issue to consider is the Chip Factor. This is not a buzzword from the movie, The Matrix. When you are moving a mirror around to clean it, there are all kinds of reasons why you end up chipping the mirror surface or edge. Glass is strange at times. You can bang it into something and nothing happens and other times you fracture the edge or chip the surface. It happens!

Look at figure 1. You will notice the metal faucet is tied out of the way. The materials I used to clean are; (2) one gallon bottles of distilled water and a box of 100% pure cotton, cotton balls. The synthetic material type can scratch or leave small abrasive streaks on your mirror. I also use a pair of disposable white plastic gloves. This keeps fingerprints off the mirror and you can grip the glass better, especially with large soapy mirrors. I washed the mirror in a plastic laundry tube. This helps to reduce the chip factor. In one of the distilled gallons of water, I added one teaspoon of Dawn liquid soap. This becomes a cleaning solution. The other gallon of distilled water is for rinsing off the mirror.

Looking at figure 2. I poured the cleaning solution on the mirror and added about two dozen cotton balls. You swirl the cotton balls around in the solution. You do not scrub or rub the surface. Most of the dust, dirt and sticky insect residue from ladybugs and bees, will wash away. You may have to repeat this 2 or 3 times, but that's ok. If you get a particle of something that will not dissolve, leave it alone. The reason behind this thinking is this, you will have to scratch it off and end up scratching the coating or leaving some kind of abrasion mark that sticks out like a sore thumb.

When you are done cleaning, raise the edge of the mirror up so the water will run off. Rinse off the soap and cotton balls with the other gallon of distilled water. Then rinse it again, until it looks clean. What do we do with the water drops on the mirror? You can take the corner of a paper towel and dab it (not rub or scrub) on the water spot and it should absorb the water. Because distilled water is used the water should evaporate and not leave any spotting. Hopefully! After I got done cleaning the 17.5 Coultter mirror I put it in the mirror box for safety and storage. So what is the next step with the mirror?



The Odyssey 2 Continues: Return of the Secondary Mirror

By Jack Brisbin

At the February meeting, we discussed what to do with the secondary mirror. However, before we could do anything I had to separate the secondary mirror from the metal bracket it was attached to. The dimensions of the secondary mirror are as follows; Width 4.25 inches, Length 6 5/16 inches, Weight 1 pound and 8.8 ounces, and Thickness is 1 inch. There are some other pictures of the secondary mirror in the February 2008 newsletter.

The secondary mirror is glued to the back of the metal bracket. It looks like the back of the mirror has a cloth membrane glued to it and the metal bracket has foam tape that has adhesive on both sides.



Figure 1, explains it all. I put the secondary mirror/bracket in a vise. I inserted a fine tooth hacksaw blade in between the cloth membrane and the foam tape and proceeded to cut through. It took a few minutes but the hack-saw worked quite well and that was not the hard or time-consuming part. Dissolving the cloth membrane and adhesive from the back of the secondary mirror was a larger issue.



Looking at figure 2, you will see a cloth membrane on the back of the secondary mirror and three strips of foam tape on the back of the metal bracket. To dissolve the glue I filled a small aluminum pan with about a quarter inch of acetone and laid the secondary, glue side down in the acetone for about 10 minutes to soften it up. I used a small metal bristle style brush to abrade the back of the secondary and separate the cloth from the mirror. Once it started to separate around the edges I put the mirror back in the acetone solution to soak for about 5 minutes. I took the secondary out of the solution and brushed the back of the secondary and the membrane peeled off. I used a rag with some acetone on it to wipe off the glue and any residue left on the back of the secondary mirror.

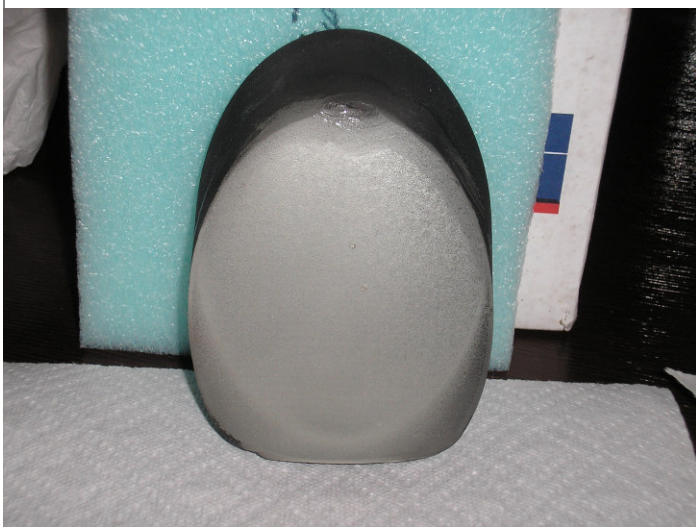


Figure 3 shows the back of the secondary with the membrane and glue all cleaned off. You will notice at the top of the secondary there is a small chip that was painted over by Coulter. You don't notice it glued to the metal bracket. The chip has been there since the telescope was made so it presents no problem. I still have the metal bracket and the large single vane secondary holder. Since it is the Clubs Secondary Mirror, what do we do with it?

<u>Expenses</u>		<u>Income</u>	
Telephone bills	-155.35	Dues @ \$20	920.00 (46)
Clear Sky Clock	-50.00	Dues @ \$12	372.00 (31)
International Dark Sky Association	-100.00	Dues @ \$5	35.00 (7)
Saturday Morning Physics	-130.00	Advanced Dues	50.00
Events	-153.53	Printed Newsletters (\$12/yr)	84.00 (7)
Supplies	-73.47	Donations	2370.00
RASC - Calendars & OH	-541.40	RASC - Calendars & OH	680.00
McMath Worm Gear Shaft Replacement	-1894.00		
McMath Drive System	-833.01		
<u>Total Expenses</u>	-3930.76	<u>Total Income</u>	4511.00
		<u>Previous Balance</u>	6720.56
		(3/26/2008)	
		<u>Current Balance</u>	7300.80
		(3/26/2008)	

Winter Escape Star Party at Chiefland Astronomy Village

By Brian Ottum

I was fortunate to escape the cold "Michigan Nebula" that seems permanently parked overhead in February. After driving to some business meetings in Atlanta, I rented a 24' motorhome. The gracious members of the Charlie Elliott Chapter of the Atlanta Astronomical society hosted me that night for an impromptu star party. Charlie Elliott is the name of a nature center located an hour southeast of downtown Atlanta. Clevis, Theo, and Jon observed with me until midnight. We became fast friends and enjoyed great astronomical conversation. The 45 degree temperatures felt balmy [to me] and were perfect for trying out my latest toy. In October, I had purchased an AstroTrac TT320 ultra portable camera tracker.



My goal is to use it for widefield images of the sky, using my modified Canon 20D and various lenses. Before this trip, the Michigan Nebula [plus work and family obligations] had prevented me from getting more than one night's worth of experience. The following image of IC 1396, a very large emission nebula in Cepheus, was taken in early November at Clay Kessler's house in Manchester. This used my Canon 200mm lens @ f/3.2 and ISO 800 (all the images in this story, save one, use this lens and setting).

FAILED FIRST GEORGIA ATTEMPT

My first attempted image on the trip was the Witch Head nebula. A ghoulish silhouette, this blue cloud reflects the light of nearby Rigel of Orion. Rick Krejci has a fantastic image of this on his website. My attempt is not worth showing here. An hour's worth of 2 minute images just barely shows the witch and she ain't pretty. During the taking of the images, we heard the howls of nearby coyotes. My hosts told stories of having potentially dangerous wild hogs come upon them while observing.



For my second image I luckily chose a much easier target. The Rosette Nebula is a red nebula, glowing from ionized hydrogen. It's one of those birthplaces for new stars. It is visible in binoculars under dark skies, just to the left of Betelgeuse of Orion. You can see that the modification of the Canon 20D really helps pick up the red. This trip features a lot of red, as you will see. This Rosette image is from 60 minutes' worth of exposures using the 200mm lens.

At midnight, it was just Jon and me. A few more winter Milky Way objects, and it was time to pack up. I groggily drove into the park, looking for the primitive campground. It was about 1am when I found it, but I nearly got the motorhome stuck while trying to back up (something verboten without a spotter). The ordeal keeps me awake for awhile, along with listening to the surrounding animals in the night (I'm a couple miles from the nearest person). However, the dawn breaks brightly with a great view over the lake:



DRIVING SOUTH TO FIND WARMTH

I arrived the next day at Chiefland Astronomy Village. CAV is located in northern Florida, between Gainesville FL and the Gulf of Mexico. CAV is a village where about 25 amateur astronomers have purchased lots & homes. Most are part-time residents. CAV is home to some of the nicest and most generous people you'll ever meet. It's easy to see why – they get to pursue their hobby under very dark skies and at great winter temperatures! CAV hosts star parties during dark-of-the-moon weekends from late fall to spring. The first weekend I was there, about 25 star partiers were camped there. Tom &

Jeannie host the campers, providing the large grassy observing field, electricity, flush toilets, warming room, open-roofed showers and a shaded dining area.



The other Tom (and Lynn) provided me with a place to park and hook up my motorhome. Not only that, they provided an observing pad for my Astrotrac and Starmaster 14.5" dob. During the next several days, I helped them host a "rally" for the owners of 12 luxury brand motorhomes. We toured CAV observatories, looked at the sun's prominences, and observed extensively with a 24" dob.



USING THE ASTROTRAC

It's pretty easy to set up and use the AstroTrac. First, I set up the photo tripod and attach the Manfrotto head which has slow-motion dials for three axes (altitude, azimuth and tilt). The AstroTrac then attaches to the tripod head. Finally, a conventional tripod head screws to the AstroTrac to hold the Canon. The AstroTrac is powered by just a trickle of 12V DC power, provided by a battery pack. Polar alignment is quick and easy using a polar alignment scope. (I hope to get a small refractor once I tire of telephoto imaging, and that will probably require some drift aligning in addition to the polar scope.) To start tracking, you just open up the swing arm and push a button. The flashing LED indicates tracking is happening. You get a couple hours of tracking before you have to rewind and start again.

The only other necessary equipment is a hair dryer (for the dew) plus a programmable shutter release.

WINTER MILKY WAY PHOTO TARGETS

I chose M31, Andromeda Galaxy, as my first CAV target because it was dropping into the west after sunset. This 200mm image is about 35 two minute exposures.



Orion is located way up high in the sky at CAV. A very tempting target with the binoculars, camera and telescope.

Got a pretty good shot of Orion's belt, including the Horsehead Nebula (just a chunk of dust in the shape of a horse's head that obscures the red nebula behind). See also the Flame Nebula, which glows due to the nearby Altinak.

Then I realized that if I rotated the camera I could fit in both the Horsehead and M42.

Living in the frozen north for most of my life, I really never got to know the winter Milky Way very well. I certainly had never seen the Seagull Nebula before.





Just like the seagull, I had never seen the California Nebula. It is big, so I could only see it with the 15x45's. It's located in Perseus, not far from the Pleiades. The 200mm lens did a good job capturing it with 80 minutes' of exposures. When I was processing this image, I thought the dark spot was some chunk of dust on my camera's sensor. But a web search showed that it's a glob of dust actually obscuring the nebula (CAV has WiFi throughout!).



It is IC 2177, a combination emission and reflection nebula that is located near (NE) Sirius. It does look like a seagull! At CAV I could see it in my 15x45 binoculars.

I put the 50mm lens on so I could catch the entire Orion constellation. This is about 70 minutes' worth of exposures at f/2.8. Barnard's Loop (another bunch of red gas up there) is easily seen.



WALKING INTO FENCES

For a couple nights, I set up the camera to automatically take pictures then walked over to the group observing field. I had the 24" dob to myself. Wow. I made a study of Canis Major and Puppis, constellations I've not seen much in Michigan. M46 with its freaky imbedded planetary nebula was amazing (I did read somewhere that the planetary wasn't actually IN the open cluster. It's closer

than the cluster, just in our line of sight). Before long, it was time to walk back to the camera to set up the next shot. In the pitch black Florida night, I walked directly into a fence (disturbing nearby observers, but I was too embarrassed to identify myself). Here's a shot of Canis Major, with magical lines that appeared in the sky just when the shutter was open.

AMAZING OBSERVATORIES

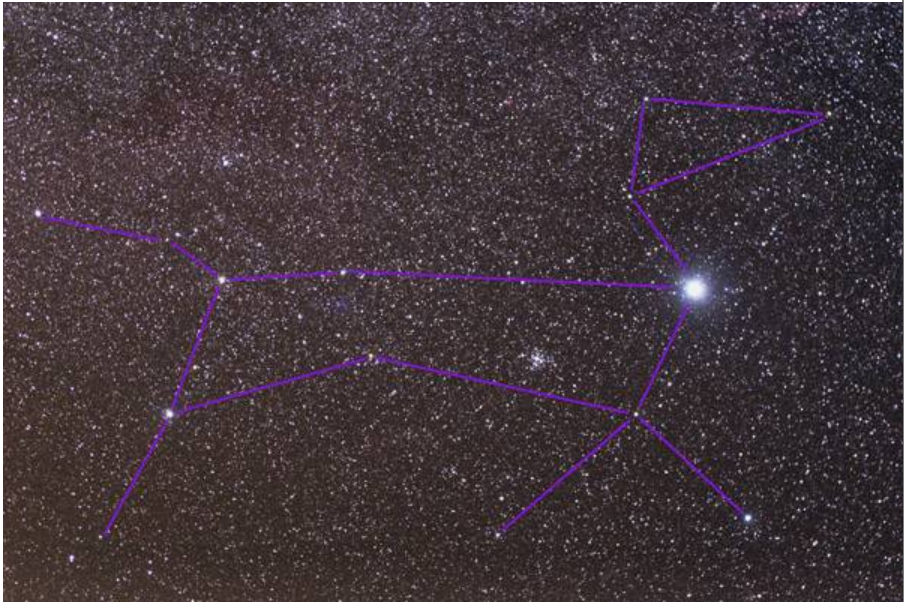
I was able to visit half a dozen of the two dozen observatories at CAV. Most are roll off roofs, but some are home-built domes. The largest observatory holds a leviathan 42" dobsonian! We actually looked at the moon with it and I could not see anything with that eye for quite awhile. The most impressive observatory has *twin* domes, housing entirely homebuilt truss tube, fork-mounted 36" & 24" reflectors. Some of the imagers there have shockingly complex rigs with lots of cables, wires and pumps. I watched one astronomer take images of distant galaxies and search for supernovae.

I was impressed with the true "village" nature of CAV. Neighbors are always visiting each other to help build something, borrow something or just say "hi."

STAR CLUSTER SHOTS

The area northwest of CAV is where the famous Suwannee River drains into the Gulf of Mexico. Lots of swamps, marshland and gators. No lights. So the Milky Way sets in a very dark sky. This allows for good imaging of two great clusters, even as they get low. You could see the Merope nebula in the Pleiades with binoculars.

My telescope showed the beautiful tiny (and distant) cluster near M35 called NGC 2168. M35 is at the upper right corner of the picture below. You can see NGC 2168 as an unresolved glow



just to the lower right of M35. It is obviously an older cluster, because it is yellow compared to M35's bluish-white. IC 443 is the curved red strip.

RHO OPHIUCHUS

I set my alarm for 4am (after the moon set) to get a picture of the multicolored nebula near Antares. I had trouble focusing my eyes, so it should not be surprising that I could not focus the telephoto. So nothing worth showing here.

VISUAL OBSERVING HIGHLIGHTS

Over the course of eight CAV nights I was able to see hundreds of objects with a variety of instruments. Here are the things that stick with me:

- noting the dark nebulae within M42
- watching the monstrous Omega Centauri rise over the distant treetops
- seeing the Owl's eyes
- seeing red in a telescope for the very first time in IC 418, the Raspberry Nebula
- zipping from M101, M81/82, M51, M97/108, M62 and the Leo Triplet with binoculars, all in 5 minutes seeing Thor's Hammer discovering clusters in Puppis and Vela



REST OF THE TRIP

After a business meeting in Tampa, I picked up my wife and daughter at the airport. We camped for four nights near Anna Maria Island's beaches. Our campground featured baby great horned owls that, despite their mom's prodding, were reluctant to take their first flight.


After dropping my family at the Tampa airport, I drove the RV back to Atlanta for [more] meetings. My adventure was capped off by viewing the lunar eclipse beside my hotel in Kentucky.



CAV DETAILS

You can get more information at <http://chiefland.org>. It is a mere 1050 miles south of Ann Arbor (16.5 hrs down I-75). The average high temperature in February is 67F, and average low is 42F (during my visit, there were two light frosts). The cost is \$35/year to join, and \$5/night to camp. See also the Yahoo group "Chiefland." CAV is expanding the observing/camping field for the busy November and April star parties. I hope to return to CAV when the cold "Michigan Nebula" returns.

Saturn

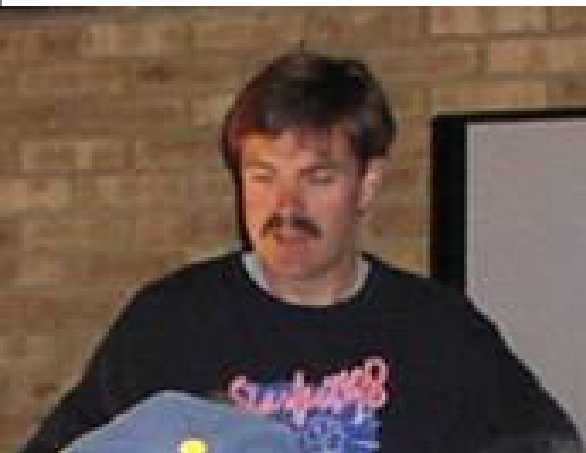

This month's contributors:

Charlie Nielsen



Jack Brisbin

Brian Ottum



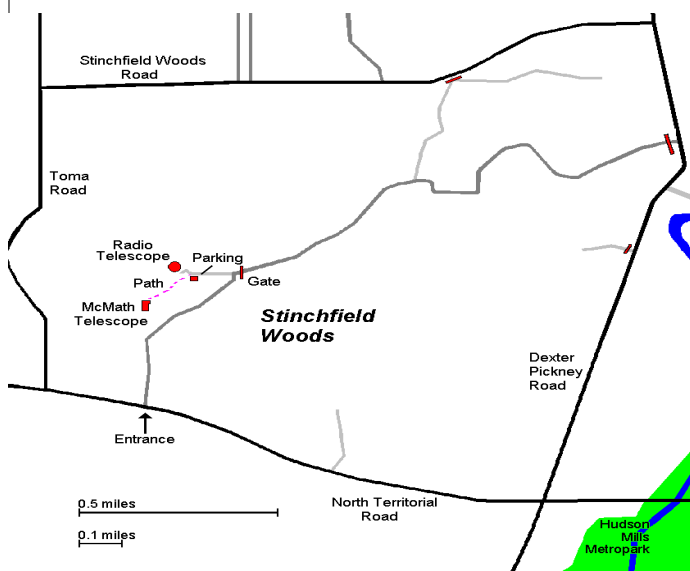
Yasuharu Inugi



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 Yasuharu Inugi

**1515 Natalie Lane #205
Ann Arbor, MI 48105**

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

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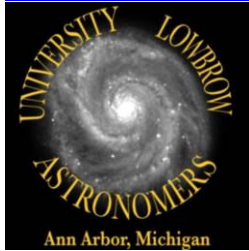


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Reflections & Refractions



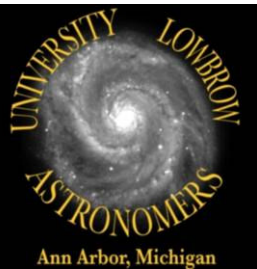
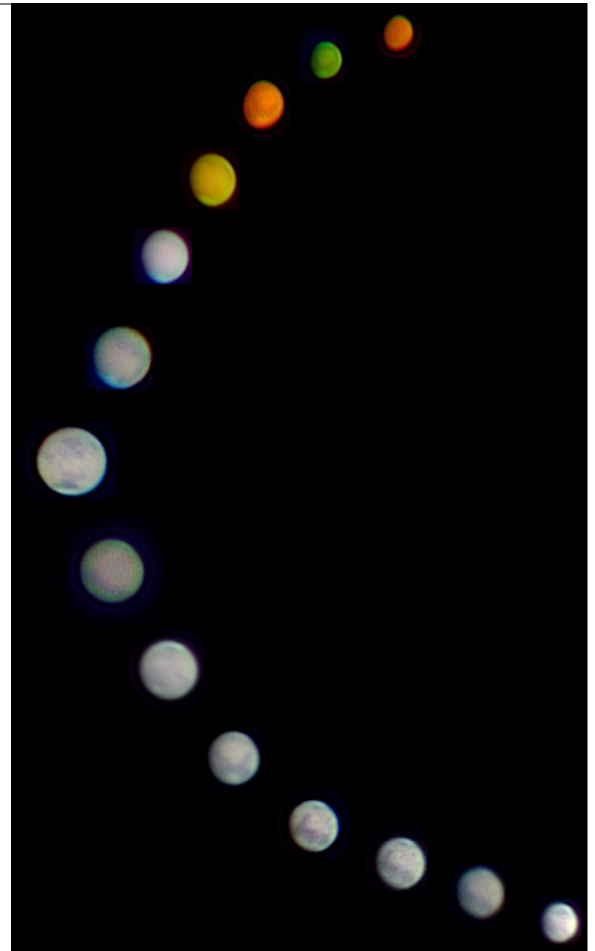
Website

www.umich.edu/~lowbrows/

As a follow-up to the March newsletter, here is summary of the Mars

opposition as observed by Brian Close in Bozeman. The top image is

September 27th and the last bottom image is March 3rd. False color in the beginning is due to Brian's slow learning curve on adjusting for his refractor's color aberration. The images were separate bitmaps generated with Registax and assembled with I-Merge shareware.



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