



Jaegers 6" f10

By Clayton Kessler

July 1, 2017

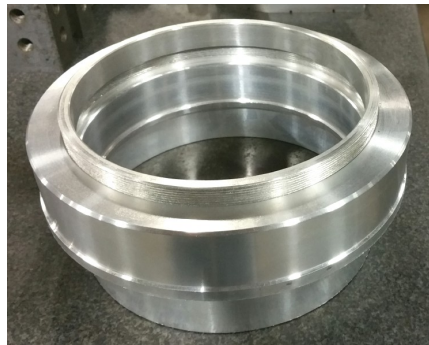
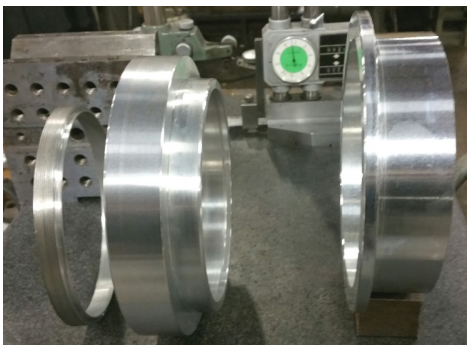
(All photos by author)

I like to fiddle with “stuff” – especially astronomy “stuff”. Almost two years ago I purchased a Jaegers 6" f10 objective set from a nice gentleman over on Cloudy Nights. After making rings for the Warren Astronomical Society's 8" D&G refractor I was smitten and wanted a larger refractor for myself. At the time I don't think I had any oddball objectives around (boy – has that changed) and a 6" seemed like a cool project that wouldn't take very long.

First off I needed to determine what I needed to gather up to build a scope like this. The objective set came with a Jaegers lens cell, which would have worked well but was fixed and not adjustable for alignment. The first thing on my list was to make a two piece cell that could be collimated. I spent a fair amount of time reading about other ATM projects and gleaned information about how other folks made similar telescopes. Three builds from Cloudy Nights were very helpful to me in understanding what needed to be done.

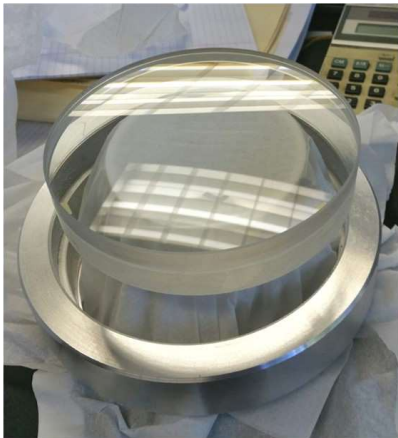
PAULEK (CN Handle) had a nice article in the ATM section on his 6" f10 build. Jeff B had a nice build with some great ideas for baffling. Mel Dawson had the most detailed information out there with detailed drawings of the “Gelinda J. Dawson” 6" f10 that resides at the Vega Sky Center. Mel had so much information on his web site it made me feel that this was a do-able project. All three of these gentlemen get a big THANK YOU from me because they took the time to document their builds and help show others the way to proceed.

First off – What tubing size should I use? After looking over all the information that I had available, I chose a 7" Hastings tube for the body and an 8" tube for the dew shield. Why a seven inch tube and not a six inch? The original Jaegers cell for the objective that I have is designed for a 7" tube and D&G uses a 1 inch larger tube for their refractors – seemed like a good hint to me. Once this basic decision was made I could start to design my cell. A little while doodling on some graph paper and I had enough to start “whacking” at some aluminum. McMaster Carr had nice pieces of aluminum tubing that was thick walled (like 8" diameter with a 1" wall thickness). I was able to choose some suitable pieces and avoid hogging the center out of a solid piece. The cell was constructed in three pieces. There was a “counter cell” that attached to the tubing and supported the main cell, the main cell that held the glass and a threaded retainer ring.

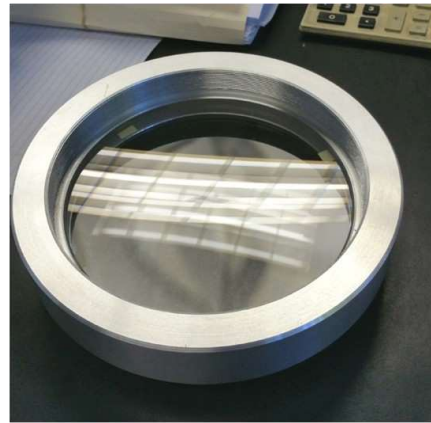


At this point these are mostly finished on the lathe but need drilled and tapped attachment and adjustment holes. I also have a few more touches to do on the lathe. They did fit together pretty well.

REFLECTIONS / REFRACTIONS



The true test is
"does the lens
fit?"



Why – yes it
does!

As I was doing this work other things have been happening. I decided to purchase a Moonlight 2 ½" focuser for this beast. I like Ron's designs and I felt this would be a very robust focuser to put on this scope – it should hold up well to large eyepieces and bino-viewers. I ended up cutting the main tube at 48". I did have to build a tailpiece to attach the focuser to the tube. For this I dug around and found a flat piece of ¾" thick stock and cut a hexagon on the outside to help me to grip it in the lathe.



Eventually I had enough done to dry-fit the cell and tailpiece into the tube.

The cell fit well but the tailpiece was a smidge tight. Easy enough to correct at this point. I still had some finishing things to do and I had to put all the attachment holes in the cell, tube and tailpiece.



I had some ideas on using an "O" ring to keep the cell and counter cell centered when they were being adjusted. I also had an idea to use another "O" ring between the glass and the retainer ring – partially to compensate for expansion effects. The centering "O" ring worked out very well.



The "O" ring between the retainer and glass..... not so much. At any rate now I had a complete and functional lens cell!



I did find that making a special spanner wrench makes it pretty easy to install and remove the retainer ring. You can see that I used six spacers on the lens instead of the traditional three. I saw several on the web that were set up like that and I decided to try it out. I am aware that three points make a plane and I can always remove three of the Kapton tape pieces should it seem appropriate. I also used three bits of Kapton tape on the back side of the lens so the lens was supported on three points by the cell. I don't know if it makes a real difference but it is easy to change if I want.

Next step – stray light control. Several of the scope builds that I used for inspiration used a baffle stack to block stray reflected light – seemed like a good idea. I decided to make a similar stack of five baffles – unfortunately only four survived the manufacturing process but that seemed close enough. The baffles were made from some 1/8" Plexiglas that I had laying around. I cut some 7" squares and drilled a three hole bolt circle to use with nylon threaded rod and nuts to hold the stack in the correct positions from each other. The holes also serve to hold everything to a simple lathe fixture for turning.



Finally – making the holes in the "donut".

Once these were turned and painted I assembled them into a “stack” with the baffle rings held and positioned by nylon threaded rods and nylon nuts.



Once inserted into the tube it made a dramatic difference

Now I am making progress! Basically what is left is to polish the tubes a bit and have them powder coated. I had long planned on Red as the tube color for this scope – I like red, it is different and Jaegers focusers had red knobs – what could be better. Well – I got the call that the tubes were ready while I was at the Cherry Springs Star Party. I told the nice lady that I would be in as soon as I got back in town.

I have been working afternoons so I headed to the powder coaters on my way to work. She said “Oh – the telescope tubes – I will go get them”. When she carried them into the office I said “they look very nice – but they are white - weren’t they supposed to be red??!?” She looked at the paperwork and said “Yep – Bright Red” – “I will get them re-painted for you”. Now hold on a second....White is a perfectly acceptable telescope color – and I did not want to wait while the tubes were stripped and re-painted – give them here! The next day at home I assembled the system. It is nice to have everything fit before the final assembly – stuff goes together so well. I started out by assembling the tube to the lens cell.



Then I added the baffles, tailpiece/focuser, rings and dew shield. It went very quickly.



Finally I was able to place it onto my re-conditioned Meade DS-16 mount and add a second set of rings for accessories and finders. Looks good – even if it is not red!

Now it is set up and balanced - ready for the clouds to roll in this afternoon as they have - oh well. I can see a few adjustments that need to be made. I can see some bright tube between the first and second baffles so I need to adjust their position - easy to do with the threaded rod and nut arrangement. I am really pretty happy with the build other than it took me too long. Now all I need is a clear sky to star test!

What's next? Well – I did find a nifty Brandon 4" f15 objective set in the original cell. I need to make a tube and a rear tailpiece as well as a front counter cell to adapt the original lens set. What the heck – the 6" only took two years.....

— THE END —

Burt Shurly Camp July 13th, July 17th

by Brian Ottum Ph. D.



Image by Brian Ottum using Hugin - Photo Stitcher to obtain panorama of Burt Shurly Camp telescope setup area.

Burt Shurly Camp is the Detroit Public Schools' summer camp. At each of 5 one-week sessions, 120 inner city kids aged 8-12 get to swim, play in the woods and learn crafts. It is located just a few miles straight west of Peach Mountain. For the second year, Lowbrows are adding astronomy to the camp program. Last year, the weather allowed us to use the telescopes on 5 straight Monday nights. This year, the first Monday (July 10th) was a cloud-out. So we tried the next night. Lightning and storm clouds approached just after we got fully set up (Jim Forrester, Jack Brisbin, Adrian Bradley and me). But we were successful that Thursday. (Each week of kids goes home on Friday, so we cut it close.)

Weather was spectacular on Monday the 17th, so the four of us were back (plus John Manney and Abe Oraiqat). We set up on the basketball court, which has a major street light bulb that gets unscrewed. Lots of open sky, and room to spread out telescopes. The evening starts with strong twilight at 9:30pm with the youngest cabin of 20 girls. They do not seem to believe they are actually looking at Jupiter and its four moons (some girls peak down the front of the tube, looking for some sort of display screen). Other scopes showed the amazing rings of Saturn or Albireo. Each cabin gets about 10 minutes, then the next one excitedly arrives. It is a bit unnerving to see 10 flashlights coming rapidly at you in the darkness (but leaders are always there to get them to stop running and to not touch telescopes). We finish by 11 pm, Adrian shouts "now it's time for a star party!" The Milky Way is easily visible so we each hunted down both great hits (M13, Ring Nebula, M51) and esoteric (Arps and minor planetaries). The last did not leave until after 1am.

This is a very important outreach program, for an appreciative audience. I urge anyone who wishes to join us through August 7. Telescopes not required: laser pointer tours, and even binocular viewing would be good.

Contact Brian Ottum: ottum@comcast.net



Jim Forrester Photo by Brian Ottum Ph.D.

Burt Shurly Camp, 7/24/17

by Jim Forrester

The best turnout of Lowbrows for stargazing with the kids at the Detroit Public Schools' Summer Science Camp were rewarded with a cheerful group of kids and some of the best skies of the summer. Brian Ottum has taken the lead on liaising with Camp Burt Shurly and, on this evening, had support from John Wallbank, Ken Ruble, Jack Brisbin, Adrian Bradley, John Manney and Jim Forrester.

The sky was very steady and transparent, a rare combination for southeastern Michigan. High power views of Jupiter and Saturn delighted the kids and Lowbrows alike. Like most of our evenings at Camp Burt Shurly, the kids were done and off to be by 11:00 PM. Unlike most nights, though, the sky was so exceptional, many of Lowbrows stayed on to take advantage of an almost perfect sky at a site absent some of Peach Mountain's sky glow

The highlight of this short observing session was capturing views of M 57's central star, first in Jim Forrester's 12.5" Dob and then in Brian Ottum's 14.5" scope. 350 X showed (with averted vision) both the 15.6 magnitude central star and a magnitude 12.5 line of sight star twinkling in and out of the view in Jim's scope. Brian's Starmaster, with its larger aperture and a bit more magnification provided a more steady view.

As usual the heavens looked even better as we broke down our instruments. The Milky Way blazed out of Cassiopea, through Cygnus, Aquila, Scutum and Sagittarius, before being cut off by the horizon. The Great Rift in Cygnus and the bulge in Ophiuchus were prominent, a sight not often seen in our part of Michigan.

Burt Shurly Camp July 13th

Reported by Adrian Bradley

Email July 14 to members: "Last night turned out very well. We had upwards of 100 campers and 4 scopes. Brian, Jim, Jack, and I provided views of the gas giants for the kids, who had lots of energy, lots of questions, and not many skills viewing items on a telescope or even a screen in my case. The night sky was awesome and would have been darker than Peach Mountain had it not been for the bright lights at camp.

We even had some fun afterwards, as Jim and I continued to observe after the last group left. I got gogo working on on 5" imager rig and got some surprisingly good views of the Trifid, the Ring, M51, and the Dumbbell. Jim split the double double and also went after objects in the summer triangle. The Milky Way arm was faint but visible."

Burt Shurly Camp July 31st.

By Don Fohey

Monday night was a lot of fun. Brian Ottum, Jim Forrester, Dave Jorgensen, John Wallbank, Adrian Bradley and I each set up telescopes. There were 113 students who enjoyed the 1st quarter Moon, Jupiter, Saturn, stars and even the occasional early Perseid meteor. There was some viewing afterward. We were all packed up by midnight.



Jim Forrester Photo by Brian Ottum Ph.D.

Okay, I Lied**(about photographing the eclipse, that is)****by Doug Scobel****(all photos by author)**

My eclipse photography setup. A Canon 7D crop-sensor DSLR, 100-400mm zoom lens, fitted with a solar filter. The camera is mounted on a Vixen Great Polaris 2 GEM with RA drive using a heavy-duty Manfrotto 486 ball mount.

Yes, I lied.

I've been telling everyone that I don't plan on photographing the eclipse. That I want to *experience* the eclipse, and not waste any time fussing with a camera or looking through its viewfinder. After all, my photos will pretty much look like all the many thousands of images others will be taking. What would be the point? Whaaat? And you call yourself a photographer?? No pictures???

Okay, maybe I'll take a couple shots during totality, *but that's it!*

Welllllll...

I started thinking. Yes, a dangerous thing. Nonetheless, I started thinking. The proper exposure (see the link later in this article) during totality is pretty dark. Trying to hand hold a DSLR at ISO 1600 equipped with a 400mm f/5.6 lens (with a crop sensor no less) during totality means a nominal shutter speed of 1/125 second. Even with image stabilization that's pretty slow. Want to bracket by a stop? That brings the longest shutter speed down to 1/60 second. Yes, I could go to ISO 3200 or even 6400, but I'm thinking image noise could become objectionable. Nah, not worth the trouble.

So I started thinking some more. If the camera was on something solid, like a tripod, then camera shake shouldn't be a problem. But the sun will be nearly at the zenith during totality, and my tripod won't tilt that far vertically. Besides, I'd have to re-aim the camera with every shot, taking precious seconds away from soaking in the spectacle. So I would need a tracking mount, to let me aim once, then take a series of shots without having to re-aim. The mount

would only have to track more-or-less accurately for about three minutes. Hmmm.

Wait a minute. I OWN a tracking mount, a Vixen Great Polaris 2. It's the mount I use for my 6-inch RFT. It has an RA drive, and it's more than up to the task of holding a little DSLR. The trick will be getting it aimed before totality. If I'm going to do that then I'll have to aim the camera during the initial partial phase. And to do that I'll need some kind of white-light filter to protect my eyes and the camera. I've been telling everyone that I'm not interested in taking pictures of any of the partial phases. But if I do, I can have the camera aimed before totality, and just let it track right through it. All I need is to connect a remote shutter release to the camera and just click away every 15 seconds or so during the total phase while I watch with my eyes and go "Ooooh" and "Ahhhh" along with everyone else. Yeah, this could work!

I already have most everything I need - the only thing missing is a solar filter for my 100-400mm zoom lens. To make a long story short, I acquired a small piece of Baader Solar Safety Film, and using the instructions on their web site (look here: <http://astrosolar.com/en/information/how-to/how-to-make-an-inexpensive-filter-cell/>) constructed a slip-on filter for the lens. It just took some poster board, single and double sided tape, scissors, Exact-O knife, some Elmer's glue, and an hour or two of elbow grease. The result is shown below



Completed filter. It's a snug fit over the end of the lens. Black flocking will help prevent stray reflections.

Next, I set up my mount and camera fitted with the new filter and tried the rig out. It works great! Even with a very rough polar alignment using a level and a compass, the tracking keeps the sun more-or-less centered in the frame for several minutes. I'll probably be cropping the images somewhat afterwards anyway, so no worries there. Here's my setup with the filter: (see page 8)

I still have a little practicing to do. But once I get my exposure settings figured out, I'll save them in my camera; one set for the partial phases, and a second set for totality. After setting everything up Monday morning before the eclipse starts, I'll take a few shots of the partial phases using the filter. About a minute before totality, remove the filter, select the totality settings on the camera (rotate one dial one click), and take several shots during totality. A minute or so after the moon exposes the sun again, replace the filter, set the camera back to the partial eclipse settings, and take a few shots during the last partial phases. The only times I'll have to take my eyes off the sun (using protection for everything other than totality of course!) is to make a couple changes just before totality and just after. The rest of the time I'll just be watching totality progress,

and clicking the shutter once and a while using the remote. At least that's the plan. If something goes haywire then I'll keep watching and sacrifice the photos – experiencing the eclipse is the goal!

Here are a few tips and some photography-speak. For exposure settings during totality, I intend to use Fred Espenak's table found here: <http://www.mreclipse.com/SEphoto/image/SE-Exposure1w.GIF>. I also intend to bracket the base exposure (the one he labels "Corona - 2.0 Rs [solar radii] / Q0") by one stop over and under. If I can convince my camera to do a five-exposure auto bracket then I'll go two stops either side. I'll be setting my lens to its maximum 400mm. It has image stabilization, so I have to write myself a note to turn it off – IS doesn't always know how to deal with a stationary camera. I'll also be setting the autofocus to use several focus points, so that wherever the sun is in the frame it will be able to focus on the limb.

I used my Canon 7D to take the images left to show you the relative size of the sun with various focal lengths. Remember that my camera has a crop sensor (1.6 factor) so the sun's image will be smaller with a full-frame DSLR (or a 35mm film camera for that matter). These images are not processed or cropped – they were taken straight from the camera. In all images the exposure was 1/800 second at f/5.6, ISO 320, through a Baader Solar Safety Film filter. Your exposure may vary somewhat, depending on the filter and camera/lens combo you use. You'll have to do your own experimenting to see what your exposure should be. Of course, any haze and/or clouds will alter the exposure too.

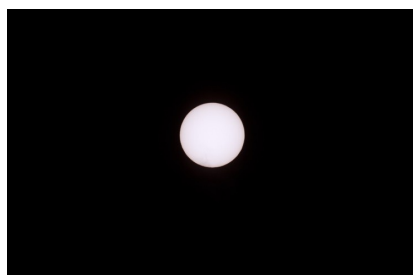
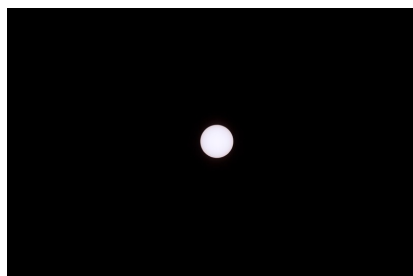


Image of the sun in my crop sensor DSLR with the zoom set to 400mm.



With the zoom set to 300mm.



With the zoom set to 200mm.



Cropped version of the 400mm image shown left.

Examining the cropped version of the image with the zoom set to 400mm, you can see the camera was able to focus on the limb, atmospheric turbulence notwithstanding. Alas, no sunspots were present. Hopefully this inspires you to maybe do the same. The more you automate things the better. You don't want to be fussing with equipment and miss part of the eclipse! And as many others have said, *practice, practice, practice!*

I've never seen a total solar eclipse, so if I come away with a great experience and maybe a decent photo or two as well then that will be fantastic!

August Events

Cromaine Library Sat, August 5, 1pm – 3pm.	3688 N. Hartland Rd., Hartland, MI
Tecumseh Star Party Fri, August 11, 8:30pm – 11:30pm.	Tecumseh, MI 49286
Rolling Hills County Park Sat, August 12, 8pm – 11pm	7660 Stony Creek Rd, Ypsilanti, MI 48197

AUGUST MEETING CANCELED

Open House at Peach Mountain Observatory Sat, August 26, 7:30pm – Sun, August 27, 12:00am

Member Evening Saturday July 15th.

by Don Fohey

Jim Forrester announce with an email that he would have the gate opened to Peach Mt. by 8:45pm for members and their guest. He was joined by myself, Barry Wissman, Norbert Vance and Adrian Bradley. Adrian opened the McMath and was later joined by Norb. I found it interesting to watch Callisto appear to just graze the north pole of Jupiter. Norb commented that he had seen Jupiter hundreds of time and had never seen that before. We all had a nice evening.

Michigan Math and Science Scholars July 18th and July 25th.

By Don Fohey

The University of Michigan Math and Science Scholars is a program for high school students who are open to the challenges of higher mathematics and sciences. We host an informal evening at Peach Mt. providing discussion of planets, clusters, nebulas and galaxies with views through the McMath and member telescopes.

On Tuesday July 18th there were 15 students lead by U of M Professor Dragan Huterer. Jack Brisbin and Charlie Nielsen operated the McMath telescope. John Wallbank setup his tripod binoculars, Jim Forrester operated the club 17" and I shared views in my 10" DOB. Shannon Murphy, from the U of M Astronomy Dept. and her husband also attended and enjoyed telescope views of common night sky objects that are no longer visible from Angle Hall. My best object of the night was the veil nebula with a 1.8 degree field of view and an OIII filter.

On Tuesday July 25th ,we again hosted another group of about 15 students. Jack Brisbin operated the McMath, John Wallbank set up a DOB, Jim Forrester the club 17", and I again offered view with my 10" DOB. Adrian Bradley arrived to offer informal lectures on what was being observed. Jupiter and Saturn offered good view early in the evening with deep sky objects later. As the Milky Way became visible Shannon enjoyed tracing the great rift (visible in photo page 6). The best object of the night was a view of the blinking planetary (NGC 6826) that Jack centered in the McMath telescope. All were amazed as they looked into the eyepiece and saw the central star disappear from view and then reappear.

Peach Mt. Open House July 29th

By Jim Forrester

Seven Lowbrows hosted about 70 visitors to Peach Mountain for the July 29th Open House. John Wallbank and Observatory Director Jack Brisbin showed folks the first quarter moon, Jupiter and Saturn as well as a selection of deep sky objects through the McMath Telescope.

Lowbrows John Manney, Mike Radwick, Ken Ruble, Doug Scobel and Jim Forrester set up equipment on the lawn by the radio telescope. Guests viewed wonders of the solar system and deep sky. Good seeing supported high powered views of our solar system neighbors and excellent transparency allowed members to offer instructive views of planetary nebulas like the Ring and Dumbbell, the massive star forming regions of the Swan and Lagoon Nebulas and an array of open and globular clusters.

Moonset at 00:41 Sunday morning gave Doug Scobel the opportunity to put the entire Veil Nebula into the field of view of his 6" f/4 "Smurfette" reflector. Mike Radwick pulled in some dim planetary nebulas in Delphinus and Jim Forrester turned his scope on some 11th and 12th magnitude galaxies in Draco.

The last of the members called it quits about 03:00 and the evening's Open House Coordinator, Jim Forrester locked the North Territorial Road gate at 03:30.

Member Photo



Abe Oraiqat emailed on July 26 to members:

"Hi everyone here is a first attempt of M27 using my unmodded Canon T3 (unmodded) for "live video" EAA. I used Astrotoaster (live stacking) in conjunction with Backyard EOS. I used a CPC800HD telescope at f/10. This image is a stack (I do not remember how many) of 5 second exposures in the heart of light polluted Ann Arbor. I want to get into EAA and I'm hoping to get one of those ZWO ASI224MC cameras (on sale currently) and use it with SharpCap on my Nexstar 6SE (portability is key these days and the sharpCap allegedly aligns by translation and rotation, which in principle helps with any tracking errors during short exposures). I figure since I had the stuff sitting around, why not try it for EAA. I felt that the DSLR EAA felt more like "regular astrophotography" than video, requiring two software programs to run at once. Let me know what you think!"

University Lowbrow Astronomers**Meeting Minutes of July 21, 2017**

President, Charlie Nielsen, opened the meeting at 8:00PM. He then introduced our speaker, Sandra Macika, who spoke to us about meteorites and their composition. Samples of her collection from around the world were presented to the audience for their examination. A short break followed.

Member, Norb Vance (host to this evening's events), reported on the progress of the EMU plans to renovate Strong Hall on the EMU campus. He went on to describe and show photos of the opening of the Headlands Observatory, a designated International Dark Sky location here in Michigan. Continuing, he showed us photos of his visit to Ferris State University observatory, and finished with photos of his visit to the home of Gerber Baby Food products and the Stephen F. Wessling Observatory, at the Kropscott Farm Environmental Center 6 miles north of Fremont, Michigan.

Business Meeting:

President, Charlie Nielsen, reported that a new set of stairs for the observatory's McMath scope has been donated by member, John Wallbank. Charlie said the July 22 open house would likely be cancelled due to weather conditions. He asked for Cromaine Library support. Info: Saturday, August 5 at 1:00 PM

3688 North Hartland Road, Hartland, MI

VP, Jim Forrester, volunteered for the July 29 OHC. Jim reported that this past week's Camp Burt Shurly gathering was well attended with support by 6 lowbrow telescopes and about 100 children attending. Next Monday is the next scheduled Camp Burt Shurly event: 8:30 PM Setup, 11:00PM Finish.

Treasurer, Doug Scobel, reported a membership of 137, and a treasury of about \$5200. He also reported that virtually all of the ServoCAT equipment has arrived for installation on the 17.5 inch scope (we're waiting for one component which should arrive Monday, July 24). We still have \$128.00 of the \$2200.00 we voted on to spend primarily for a 12 volt deep cycle battery and case.

Observatory Director, Jack Brisbin, reported that Spectrum Coatings still has not finished the 8" scope coating. He also has been working with the U/M people to repair the damaged lock on the observatory door.

VP, Larry Halbert, reported that he is continuing to distribute the Lowbrow brochures he has made.

Newsletter Editor, Don Fohey, asked for articles for the newsletter. He stressed the importance of providing articles relating to our club's current activities to document who we are. Astronomy photos are welcome.

VP, Adrian Bradley, reported that he is now comfortable with controlling the McMath scope during Open House activities.

VP, David Jorgensen, had nothing to report.

Observatory Director, Jack Brisbin, reported that the MMSS event was successful.

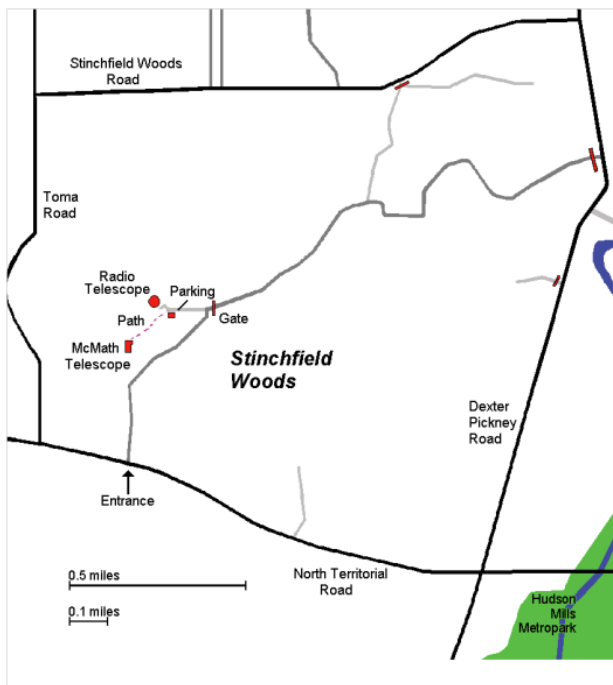
Charlie, closed the meeting at 10:18 PM.

Submitted by VP, David Jorgensen

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 Angel 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.

Peach Mountain Observatory is the home of the University of Michigan's 25 meter radio telescope and McMath 24" telescope which is maintained and operated by the Lowbrows. The entrance is addressed at 10280 North Territorial Road, Dexter MI which is 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 Mt. Observatory, but are usually cancelled if the forecast is for clouds or temperature below 10° F. For the most up to date info on the Open House / Star Party status call: (734) 975-3248 after 4pm. Many members bring their telescope to share with the public and visitors are welcome to do the same. Mosquitoes can be numerous, so be prepared with bug repellent. Evening can be cold so dress accordingly

Lowbrow's Home Page
<http://www.umich.edu/~lowbrows/>

Membership

The University Lowbrow Astronomers membership dues 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. Membership entitles you 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, by PayPal, or be check made out to University Lowbrow Astronomers and mailed to:

The University Lowbrow Astronomers
P.O. Box 131446
Ann Arbor, MI 48113-1446

Lowbrow members can obtain a discount on these magazine subscriptions:

Sky & Telescope - \$32.95/year or \$62.95/2 years
Astronomy - \$34.00/year, \$60.00/2 years or \$85.95/3 years
 For more information about dues or magazines contact the club treasurer at: lowbrowdoug@gmail.com

Newsletter Contributions

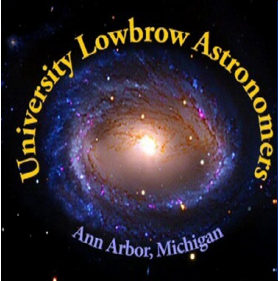
Members and non-members are encouraged to write about any astronomy related topic. Contact the Newsletter Editor: Don Fohey donfohey@gmail.com to discuss format. Announcements, articles and images are due by the 1st day of the month as publication is the 7th.

Telephone Numbers

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	Larry Halbert	
	Dave Jorgensen	
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Observatory Director:	Jack Brisbin	
Newsletter Editor:	Don Fohey	(734) 812-3611
Key-holders:	Jim Forrester	
	Jack Brisbin	
	Charlie Nielsen	
Webmaster	Krishna Rao	

A NOTE ON KEYS: The club currently has three keys each to the Observatory and the North Territorial Road gate to Peach Mountain. University policy limits possession of keys to those who they are issued. If you desire access to the property at an unscheduled time, contact one of the key-holders. Lowbrow policy is to provide as much member access as possible.

Email to all members
Lowbrow-members@umich.edu



University Lowbrow Astronomers



Member Club



Astronomical League Member Society
#201601, Great Lakes Region

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