

## Stellafane 2008

### The Grind Continues

By Jack Brisbin

Stellafane sits on roughly 90 acres of land that is known as the mecca for Amateur Telescope Makers. Legions of amateur telescope makers travel to Breezy Hill in Springfield Vermont. They come there to discuss the design, manufacture and the ins-and-outs of telescope making. Some people refer to it as the “secrets of the ATM’s”. The person most credited with amateur telescope making and sometimes referred to as the “godfather” is a gentleman named Russel Porter.

Porter trained as an architect in Boston, explored the arctic with Robert Peary and Frederick Cook and returned to Springfield to work as an optical engineer at Jones & Lamson Machine Co. In 1929 Porter moved to California to direct the building of the 200-inch Hale Telescope at Palomar Observatory. In 1920 Porter conducted a class in telescope making at Jones & Lamson Machine Co. 15 machinists and toolmakers and a stenographer, the lone female, signed up for the class. Those students along with Porter and James Hartness President of the Jones & Lamson Machine Co. formed the core of the original Springfield club.



Under the leadership of one of the instructors, this student spent some time grinding a 27 inch mirror. The yellow disk on top is the tool, the mirror is on the bottom.



A lecture on fine grinding and polishing techniques was conducted for beginning ATMs in the Flanders Pavilion



We start our tour of Stellafane in the Pavilion. This picture shows the grinding stands that are used by the students to learn how to grind a mirror



Shown here are the materials used in the Pitch Lap making demonstration



The instructor discusses the melting of the pitch as he pours the pitch into the taped dam around the tool. This will become the polishing lap.



The pitch lap was formed using a mirror on top technique. The pink solution is cerium oxide.



Cerium oxide is used for polishing and to keep the mirror from sticking to the pitch. The pitch lap will have the same form as the mirror. The bottom picture on the left shows a completed pitch lap with the groves cut in. There are many techniques for grooving a pitch lap. The instructor used a single edge razor blade to cut the groves and he made it look easy. Some of the instructors are professional opticians and can answer a lot of your questions



Shown here are some commercial parts and some home-made parts used for telescope making.



The Flanders Pavilion is used for the ATM demonstrations, technical talks and many other events. The building can be completely closed during thunder storms, so you can stay dry.

Over the years the Springfield Telescope makers have changed Stellafane to be more family orientated. They have astronomy activities, Friday and Saturday for children ages 5-12 in the McGregor Observatory classroom. There are other types of talks, such as; "Using a Telescope with you Child",

and "Discover and Enjoy the Sky".



The McGregor Observatory is a big roll off roof observatory with a classroom. Surrounded by an observing area with a couple of big dobs that add to the adventure. The observatory houses the Thirteen-inch Schupmann Telescope. Below is an illustration of the telescopes design.



Amateur telescope makers from all over North America, Europe and some times Australia come to Stellafane with telescopes they have built and enter them in the Optical competition or Mechanical competition. One entry that drew a lot of interest where the two 16 inch F/16 cassegrain telescopes that where hand made by two members of the Springfield Telescope Makers.



Look at the van, then look at the size of the telescopes. Both telescopes are on equatorial mounts. They made the 16" mirror and secondary for the optical system and used interferometry to show the optical quality. The machining was first class. They used raw stock and machined it into finished parts; optical tube assembly, equatorial mount, shafts, gears etc.



This tells it all, a photographic display booth of 8x10 pictures shows the manufacturing and construction of the telescopes. The pictures describe the optical work as well as the machines used; Bridgeport mill and lathe just to name a few. These telescopes won awards in the optical and mechanical competition.

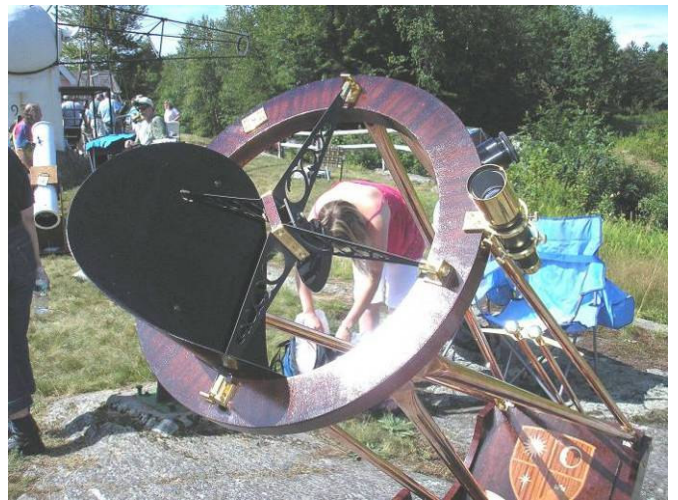
After looking at those two machined masterpieces my eye was attracted to this 12.5" F/5 telescope named "Captain Nemo's Telescope."

The telescope was built by Ross Sackett a member of the Memphis Astronomical Society. The telescope is based on the question; "If Jules Verne owned a Dobsonian telescope what would it look like." This telescope is based on a design called "steampunk" This definition is copied from his flyer; "Steampunk is a contemporary art movement that blends modern technology with Victorian aesthetics, yielding chimeric hybrids". An example would be a laptop computer sheathed in rich mahogany, polished brass and gears and sprockets. This is clever and creative.

The telescope is made of Baltic birch plywood covered in African mahogany veneer, shaded stain and polyurethane finish. The truss pole design is made of six 7/8 OD polished copper tubes anchored by brass brackets. Another nice feature that was incorporated in the design, is a sliding bolt and four catches that are used to lock the mirrorbox to the rocker so the telescope can be rolled on the permanently attached wheels.



The next picture shows the upper cage and the offset 4 vane secondary holder. The vanes are cut in a "twining vine" pattern and are held in place with brass attachments. Then check out the brass finder scope.



The next picture shows the gear and sprocket design that is a classic part of steampunk.



Look at the top of the rocker box and you will see two copper tubes that run halfway up the telescope that have brass knobs on the end. The bottom of the copper tubes are connected by gears to the roller chains and sprockets. You stand at the eyepiece and turn the brass knobs that will collimate the telescope, clever!

As I continue to look around stellafane I have not forgotten about the club's 17.5 Coulter mirror. The club is planning on building a new telescope and I have seen a couple of dobsonians built around a Coulter mirror. The first one is unusual because he flexes the mirror into a parabolic shape and uses a series of levers to correct for astigmatism in the mirror.

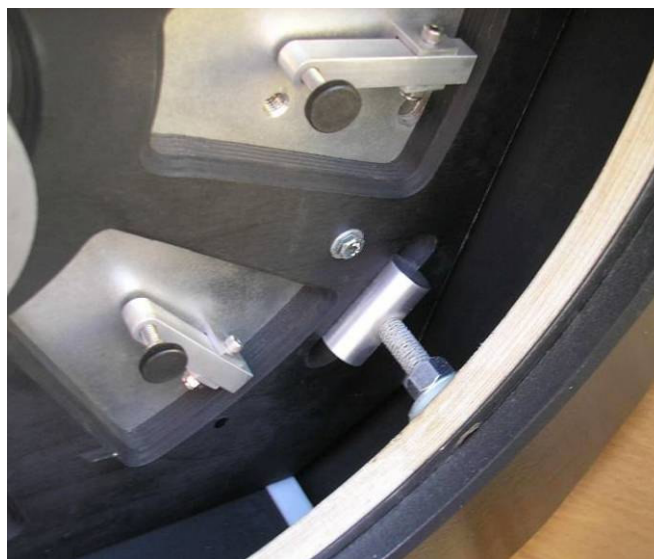


I'm not going to go into detail on how this telescope was built, what I want to show is the mirror cell design. The guy who built this titled his design; "17.5 Coulter with Flex Mirror and Astigmatic Corrector Plate". The black spokes in the mirror cell are made out of one piece of 3/4 plywood. The silver colored background is a 1/2 aluminum plate. In

the center you will see an aluminum disk with a black knob.



In the center of the mirror cell you can see a round disk of aluminum with a black knob on it. Look closely and you will see a spring between the disk and aluminum plate. You turn the knob and it flexes (stress) the mirror into a parabolic surface. This mirror cell is more complicated than it looks. The mirror actually sits in a pink insulation foam insert. The other part of the mirror cell design is used to cancel out the effects of astigmatism. Looking at the next picture gets to be complicated. You will see a close up of the levers that are located around the mirror cell. As you screw in the levers they push a pin in to another 1/4 inch aluminum plate that sits underneath the pink foam insert. Yes, this is getting complicated and I really need a technical drawing.



A lot of thought went into this type of design and I give the guy credit for figuring it out. Presently club members are

working on building a new telescope using the clubs 17.5 Coulter mirror. The dobsonian below is a home made design and has a 17.5 Coulter mirror.



This dobsonian weights a total of 90 pounds and utilizes permanently mounted wheels to move it around. The owner invited me to pick it up with him, I did. The two of us easily moved this dob around. The truss tubes are stainless steel shower curtain rods. Notice the side bearing sits between the rocker box sections. That white tube that supports those sections is schedule 30 pvc (thinwall). He used four of them, one at each corner to cut down on rocker box weight. Here is an inside picture of



the rocker box showing two pvc corners. The wood and pvc is held together with threaded rods through them (pvc) and nuts on the ends. The side bearings are attached to edges of the rocker sections. Shown here is the secondary



cage. The white tubes are one inch diameter schedule 30 pvc tubes. They have threaded rods through them that are secured by nuts on the ends. Notice how the secondary mirror holder is attached to the spider vane.



The top photo shows the secondary cage and focuser and finder scope. The next dobsonian is unique in its own right. I didn't get to talk to the owner, but the rocker is made of a unique material.



Sorry but this photo came out fuzzy.

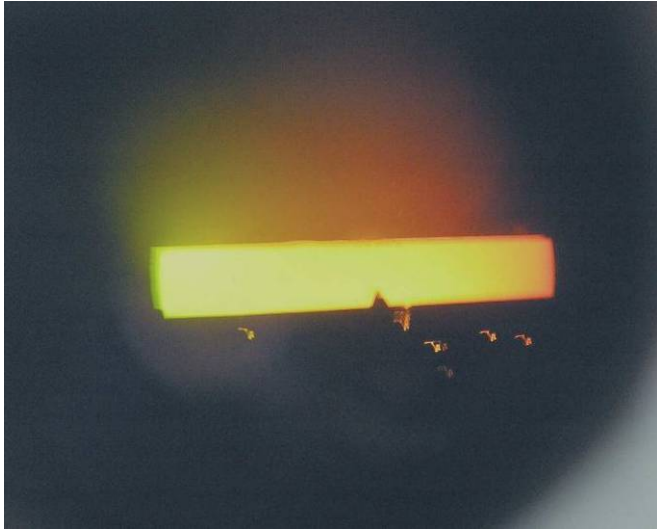


Now what do think this guy is looking at. If you guessed home made solar spectroscope, you guessed right. This spectroscope is made out of plywood and surplus lens from Surplus Shed and just used parts. I almost forgot one of the most important parts, the rubber band. Take a good look at the next picture.



Now this new material is revealed. The holes cut in the keg where not cut with a hand held hole saw. Now we know what to do with those empty kegs students leave lying around. I continued to walk around stellafane and look at the different telescopes but on occasion you walk into some type of home made gizmo. This happens at Stellafane.

Notice the slit in the lower left hand of the picture. The spectrum is focused by the lenses on to the mirror at the right. As the mirror rotates part of the spectrum is magnified through the eyepiece and you see the absorption lines in a section of the spectrum. As you rotate the wheel on the side the mirror moves but is held in place by the tension from the rubber band.



The absorption lines are there, the camera could not see them because of the glare. It works! This wraps up the article, if you want to learn more go to [Stellafane.org](http://Stellafane.org) or just google Stellafane. From my house (canton) to Springfield, Vermont is about 745 miles one way or almost 1500 miles round trip. Round trip; Gas cost me about \$300 plus and \$40 for toll roads. If you haven't been to Stellafane, then go there at least once, it's worth it.

### A Night Sky Network Event

By Belinda Leeb

St Thomas is excited to welcome the Lowbrows on October 3<sup>rd</sup>! The time we should arrive is around 7:00 (so that we can set up with some light) observations start around 8:00 and goes until 11:00. There is Bible study before the observing session and we are welcomed to attend it. Adding to the fun, St Thomas is providing snacks and hot beverages. At present there is not a firm back up activity but as time approach there will be one. The coordinator is Belinda Lee, please E-mail her ([belindaleeb@cs.com](mailto:belindaleeb@cs.com)) and let her know if you plan on attending. This a great viewing location so come out planning to share and enjoy the sights. Directions are as follows:

#### **For those coming from Ann Arbor-**

From 94, exit onto Baker Road (exit 167).

Turn south (left) on Baker and pass the McDonalds. At the "T," turn right on Jackson. Pass Peace Lutheran.

At the light, turn left on Parker.

Continue south on Parker for 4.4 miles.

Turn right on Ellsworth.

The church appears after 1.5 miles.

#### **For those coming from Manchester-**

Take M52 north to Pleasant Lake Road, Turn right on Pleasant Lake.

Go 5.4 miles, passing the Freedom Township town hall and Fletcher Road.

Turn left on Schneider Road and follow it until it ends (1.5 miles).

Turn right on Ellsworth.

#### **For those coming from Saline-**

Come north on Ann Arbor-Saline Road.

Turn left (west) onto Pleasant Lake Road.

Go about 5 miles.

At the "T" turn right onto Parker.

Just over the crest of the hill, Turn left onto Ellsworth.

The church is 1.5 miles down Ellsworth.

### An Editor's Appeal!

Okay, everyone you've heard me beg for articles in the past and I do appreciate those of you who have contributed. It takes a lot of time each month to put together a newsletter that is primarily made up of original article and pictures by members of the University Lowbrow Astronomers.

I don't want to have to reduce the number of pages in this publication because of insufficient material. Nor, do I want to republish articles of the internet written by non-club members.

This is **YOUR** newsletter and it should be filled with your material. So, participate a little and send me a little something once in a while. Here are some suggestions:

1. A picture of you and your telescope, with a bit of accompanying text.
2. Tell us how you got interested in astronomy.
3. Write a review of a astronomy related book you've read.
4. Send me a list of Astronomy related web-sites you like and briefly describe them.
5. Tell us about any astronomy software you use and why you like it.

The point is; this is not a free ride, you get what you put into it and this editor needs your help!

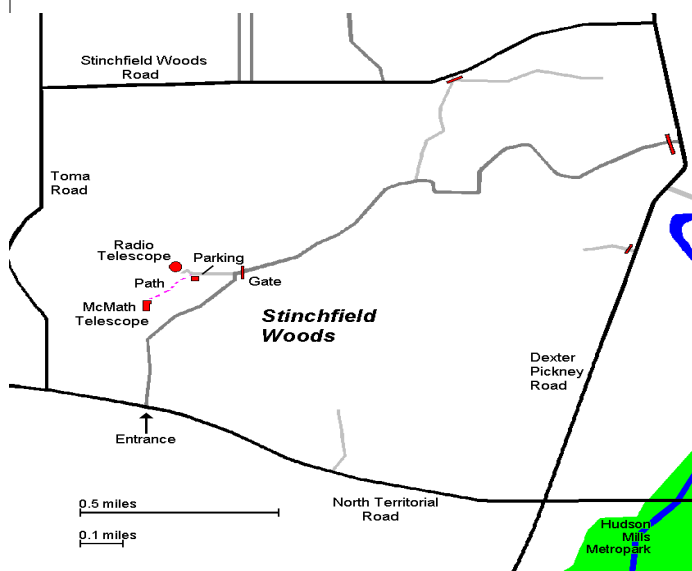
Thank you,  
Mark S Deprest



## 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 3<sup>rd</sup> 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**

**2918 W Clark Rd #203  
Ypsilanti, MI 48197**

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](mailto:msdeprest@comcast.net)** to discuss length and format. Announcements, articles and images are due by the 1<sup>st</sup> day of the month as publication is the 7<sup>th</sup>.

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## Lowbrow's Home Page

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

## Email at:

[Lowbrow-members@umich.edu](mailto:Lowbrow-members@umich.edu)



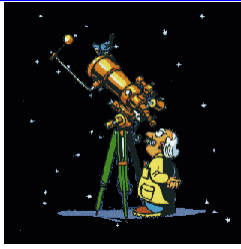
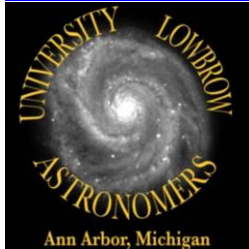


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### Reflections & Refractions

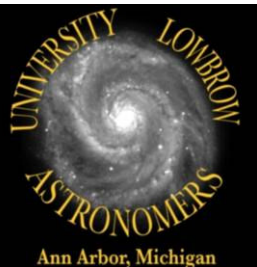


### Website

[www.umich.edu/~lowbrows/](http://www.umich.edu/~lowbrows/)

## Coming Attractions

- One Night at Tomahawk Creek—Mark Deprest
- A simple Heads-up Display—Tom Ryan
- Mauna Kea—Arthur Suits
- Imaging Quest—Belinda Leeb
- My First Telescope—Don Fohey
- Black Forest Star Party—Someone
- Your Article—You! (I hope)



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