University Lowbrow Astronomers
Ann Arbor, Michigan

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University Lowbrow Astronomers

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Inside this issue:

Right: ***Dave Tucker***

Dave Tucker's—Dumbell

Image taken from my backyard Friday Night under clear but hazy conditions, About One hour total exposure time.

What it is:

M27 is a so called "Planetary Nebula", the first such object discovered (in 1764). These objects are formed when a medium sized start (like our sun), toward the end of its life, goes through a sort of explosion, blowing most of itself (i.e. the stars outer atmosphere) into space, leaving behind a small, very hot, "dwarf" star and a huge, expanding cloud of gas. The gas cloud fluoresces as it gets bombarded by Ultraviolet light emitted by the bluish-white dwarf star remaining in its center. The object is estimated to be 1000 light years away, glowing about 100 times brighter then our sun.

Our sun will eventually blow itself up in a similar fashion, leaving the inner planets (including earth) as burnt cinders.

The object is fairly bright as nebula's go, and is easy to see through a small scope, appearing as a grey puff of light roughly in the shape of an apple core. Larger amateur scopes show more detail but I think it would take a very large scope to make the color visible to the naked eye.

The image was created from four separate "stacks" of photographs, the longest sequence imaging white light plus three shorter stacks taken through red, green and blue filters. These were then combined in JASC paint shop to build this color image

Important Club Info

- **Friday, October 20, 2006.** (7:30 pm). Monthly Club Meeting.
- **Saturday, October 21, 2006.** *May be cancelled if it's cloudy.* (Starting at Sunset). Open House - Peach Mountain.
- **Saturday, October 28, 2006.** *May be cancelled if it's cloudy.* (Starting at Sunset). Open House - Peach Mountain.
- **Friday, November 17, 2006.** (7:30 pm). Monthly Club Meeting.
- **Saturday, November 18, 2006.** *May be cancelled if it's cloudy or too cold.* (Starting at Sunset). Open House at Peach Mountain.
- **Saturday, November 25, 2006.** *May be cancelled if it's cloudy or too cold.* (Starting at Sunset). Open House at Peach Mountain.

CAPTAINS LOG, BFSP 2006—HOW I SURVIVED THE LOWBROW INVASION

By: Charlie Nielsen, Captain of the good ship Lowbrow.

Survived the Black Forest Star Party? To some extent, the expression does apply. So read on and I will describe my first Black Forest Star Party in a daily log or dairy style.

Star date 20060823: ***The Day Before.***

What; the price of gas has actually dropped before I am going on a long trip? You know how that goes, so I filled up today before it changes. For a couple of weeks I have been slowly condensing my stuff to take on the trip, and I started loading my van last night. So today I finished except for my travel and clothes bags, and checked the items off my packing list. Dave Snyder is riding out with me, so I picked him up so we could both visit our banks, and get lunch at the Chinese Buffet. Dave and I visited the bookstore at the end of the shopping center and bought a Pennsylvania road map and one of those very detailed gazetteers. I dropped Dave off and returned home. Nothing to do now but wait, and try not to stay up too late.

Star date 20060824: ***The Journey Begins.***

I awoke about 6:30 am and brewed some coffee. I loaded my travel bag in the van, ran down my checklist one more time, and secured the house. After my shower, and the caffeine doing its thing, I was feeling ready to go. Just before I walked out the door, a light rain began. Now let's not let that be an omen, or was it? I have struggled to permanently repair a leak I have in the back area of my van, so I made sure my "Lowbrow Funnel" was in place. Amazing what one can do with a tarp and a bucket. I got ahead of the rain as I drove to Dave's condo, but of course it started again as soon as I lifted the rear hatch. We loaded Dave's stuff, and we had liftoff at the 7:45 am mark. It rained all the way down to Toledo. Traffic started to back up just south of the Ohio border due to some construction ahead. I diverted onto Alexis Road with the intent to drive straight across the north end of Toledo, and get on I-75 southbound. The flaw in the plan was that the southbound entrance was closed due to construction. So we had to go north on I-75 back to Michigan. Now this trip is headed the wrong direction, literally. So we get turned around a few miles later and re-enter the state of Ohio. Before we can get from I-75 to southbound I-280, we are diverted into downtown Toledo due to new bridge construction. We were very happy to finally see the Ohio Turnpike and get headed eastbound. As I suspected from checking radar this morning, we got ahead of the rain. However if we stopped for a pit stop for ten minutes, it would start to catch back up with us. The miles seemed to pass quickly, and the next thing we know, Dave and I are seeing the Pennsylvania border. The scenery continued to get better as we headed into the Allegany Mountains. Once off the expressway, the trip took on a much different nature. Time seemed to stretch out, the miles went by slower, but the scenery made me not mind too much. We arrived at Cherry Springs State Park at 4:30 pm. Alas, I have arrived at the location I have heard so much about the last few years, and I was really happy to finally see it. It was not too difficult to locate "Camp Lowbrow", and our assortment of "invaders from Michigan". I wasted little time in getting my tent and scopes set up. Dave had the luxury of borrowing a tent from Mark Deprest, which was already set up for him. I had about an hour or so to relax before the sun started to set. Though there was much humidity in the air, the sky was clearing up. Could it be that we will be observing on my first night there? True it was, and it got very dark. My Telrad dewed very shortly after sunset, so I plugged in a dew heater. The transparency was never good, but varied over the sky and changed over time. The great rift of the Milky Way was very apparent, and the area around Cygnus was magnificent. I started with my 12" Orion Intelliscope Dobsonian by picking off the eye candy objects in Scorpius and Sagittarius. Most of the objects were somewhat subdued due to the amount of water vapor in the air. The atmosphere was better up around M11, and the Wild Duck cluster was a beautiful site in my 17mm Nagler. This was one of the best views of this cluster I have ever seen. That reminded me of the best view I ever had of the Veil Nebula, which occurred at the old SMURFS site west of Alpena, Michigan. So, I had to check out the Veil. The view did not compare well, but I had to consider the sky condition I was working with. I found M13 to be particularly impressive, and even more so the little galaxy that resides next to it. This was one of the best views I have experienced with that galaxy, and it was very easy to spot. I got a mediocre view of M27, but M71, which is in the same general vicinity, was very nice. I moved over to M57, T-Lyra, and did some sweeping along the Cygnus and Aquila milky way. About then the sky seriously deteriorated, and about 2.5 hours or so into our night, we were pretty much done in by clouds. I folded around 2 am.

Star date 20060825: ***A Different Kind of Observing!***

I awoke around 7:30 am. I noticed the air was very saturated as I walked to the bathroom and then to the food tent to get some coffee. I just sat down at a covered picnic table, and the rain began. It quickly turned from moderate to very hard rain, which continued for nearly an hour. I waited it out and returned to camp to find some more soggy Lowbrows had arisen. I discovered some water in my new tent, which did not please me at all. At least my van does not have a sunroof that could have been left open, but Doug Scobel was not so fortunate. I will not get into the horrible details. I did check on the performance of the "Lowbrow Funnel" and was pleased with the job it was doing. Too bad that I needed it. I got something to eat at the 24 hour food tent and visited the vendor tents. I bought a pocket sky atlas, and allowed Howie Glatter to take a donation in exchange for a barlowed laser collimator. A large 40 mm eyepiece caught my eye at the Burgess table, but I did not let instinct take over, for now. I returned to Camp Lowbrow and asked if anyone was interested in visiting Pine Creek Canyon which is about 30 to 45 minutes east of Cherry Springs. The

only taker was Dave, so we promptly got in my van and took off. The last part of the trip was somewhat frustrating because we discovered that distance is measured and printed on road signs in some way which we could not identify. We also found that road signs could be a fair distance from the object or turn that it displays, or it could be right at the object or turn. If you miss a turn in this country it could be several miles later before you can get turned around. This is wild and mountainous country, and roads are narrow, constantly turning, and going up or down hill. But once there Dave and I were very impressed with the canyon. It is called the Grand Canyon of Pennsylvania, and it lives up to its name. We took several pictures along a walkway that if stepped off, will let you fall almost straight down about 700 feet. Fortunately we refrained from doing that. I definitely want to explore this area some more on a future trip, and take the trail to the bottom of the canyon, where a waterfall resides. Dave and I returned to Camp Lowbrow shortly before Mark Deprest's presentation of his famous Jambalaya. I tried and thoroughly enjoyed both versions that Mark prepared, and I thank him very much for a fine supper. Soon the sun would set under mostly cloudy skies, but I said "mostly" cloudy. We actually started some keyhole astronomy, compliments of Yasu's fine shooting down of Messier objects with his 70 mm binoculars. He was a man possessed, and we defiantly observed despite the conditions. I think I was the first to notice some faint flashing activity to the north, and eventually someone confirmed that I was not hallucinating. It was lightening, and it was getting worse. The evening continued with us still taking advantage of sucker holes. I even fired up my Orion 80 ED refractor for about 20 minutes. Eventually our lightening observations overpowered our astronomical observations, and then it got worse. Our hosts, the Central Pennsylvania Observers, announced on the PA system that a tornado was confirmed in the county to our immediate west, and it was headed our direction. Now things were getting exciting. Many that know me know that I have a talent for sharing space with funnel clouds. Many people were leaving the site in their cars. A couple of club members wondered if we should leave, but I pointed out that we probably had less chance of encountering the tornado by staying in one location. So we continued to get blinded by ground strikes, which were now all around us. Just when it looked like we were going to get seriously spanked by Mother Nature, things started to calm down. One storm passed to our north, another to the south, but we remained dry. I think I retired around 1 am.

Star date 20060826: *The Fog, the Mist, Yet We See Stars?*

I emerged from my tent to greet the finest view of the Lagoon Nebula I have ever seen. It's as if I were actually in it; or could it just be fog? Yep, it was fog. Some fellow Lowbrows confirmed it. I got some experience driving in the mountains in the fog as Dave and I headed for another state park south of us where pay showers were available. I believe there were some fine vistas to behold along the way, but with the fog it was like staring into a white sea. The fog turned to a light mist in areas on the return trip, as it was until some time in the afternoon. Finally things began to dry out a little, but the forecast for the night looked dismal. I ran into Nate Murphy at the vender tents and discovered that he was about to pick up the TMB Paragon 40mm 2" eyepiece that he has so patiently been waiting for. Oh darn, it happened to be the eyepiece that caught my eye the day before, and Mr. Burgess had a couple more in stock. I am pleased to report that I have since tried it in my 12" F/4.9 reflector, and my 80 mm F/7.5 refractor, and I am very impressed. Too bad that test did not occur the night after I bought it. We congregated at the presentation area to hear Mark's talk, which of course he performed in his usual excellent fashion. The keynote speaker was Sue French, and she did an excellent job. Other than having some trouble with the laptop remote control, she was very smooth. Her talk title was "Obscure Sights for Black Forest Nights", which she changed to "Obscured" sights to match the weather prediction. I got a few minutes to talk to her before her presentation and of course asked her to contact us if she was ever in Michigan. Dave and I also spoke with her for a while after her talk and of course bought her book which she autographed. If you get an impression of her personality from the way she writes, it is most likely very accurate. She sounds and acts just like she writes. The Lowbrows had great success at the door prize drawing! Mark won a Coronado PST (perhaps the grand prize), Doug won a Meade Deep Sky Imager Pro, and Yasu won a Moonlight Newtonian focuser. Way to go guys, but darn it Mark; I put a lot of tickets in that Coronado can! Before and right after the drawing several Lowbrows pulled camp and headed home, leaving only half of us (10 or 11) still there by Sunday morning. As it turns out that may have been a wise decision on the part of the escapees. It never cleared at all Saturday night, but eventually some Lowbrows did see stars. We took Yasu and Yumi's planetarium to a covered pavilion and watched stars on the inside of the roof. It was far better than standing in the misty rain that had started once again. At times the mist was so thick that it was very hard to see anything in front of you, with or without a light. In fact, at one point I even had a short conversation with Mike Radwick, until I discovered that Mike was really our electrical outlet post, which upon further observation did not resemble Mike much at all. Unfortunately there were witnesses to that event, so you can imagine the comments I heard. We finished the evening talking around a candle under Yasu and Yumi's canopy.

Star date 20060827: *If Ye Start in the Rain, Does Ye Finish in the Rain?*

Yes! I awoke before 6:00 am to light rain and wind. Gosh, how I hate pulling camp wet. Though the rain stopped just after I walked outside, I had a feeling that waiting around for things to dry out a bit was probably futile. So Dave and I packed up, and just after I adjusted the "Lowbrow Funnel", the real rain started! Yasu, Yumi, Dave, and I were trapped under their canopy just a few feet from my van as the rain came down in torrents. Eventually it let up and Dave and I said farewell to Yasu and Yumi, who were now the only Lowbrows left on the scene. Jason decided to caravan behind us for the return trip. It rained continuously through Pennsylvania, only the intensity varied. Due to yet another very short notice road sign, Jason and I almost tangled cars in an attempt to avoid getting run over by a truck at the entrance to I-80. It rained through at least half of Ohio, only lighter. Dave, Jason and I stopped and talked at some length a couple of times, so the trip back was extended. Somewhere along the turnpike I declared to Dave that I was dropping him off, and continuing on to the southwest desert, unless he wanted me just to make the left turn with him. I had really had it with the rain! I got home just before dark and started unloading. I was really exhausted!

Epilog: *Was It Worth It?*

From an astronomy point of view, it was a near complete disaster. The worst weather for this star party in its history and camping in the rain can be quite unpleasant. Did the influx of rookie Lowbrows jinx it? I discovered that this was Sue French's first BFSP also, so I though it would be convenient to blame her. Am I sorry I went? Absolutely not! Any time spent with our club members is time well spent. The scenery in the area and much of the trip there is very beautiful, and I was very impressed with the "Grand Canyon". I met some new people, and spent time with some that I got to know a little better. There was no cell phone, no TV, no E-mail; even a radio station was not easy to obtain. I needed to drop off the grid for a while, and this trip certainly fulfilled that. It was at times very relaxing, yet at others very stressful. But it was a different reality, and I needed that. Will I return? You bet! Probably next year. The best way to answer an incomplete mission is to do it again. Learn from the experience and do it better next time. In this case however, I mostly need a better performance from the weather gods.

Gravity: Part 4 - Globular Clusters and Galaxies

by Dave Snyder

Before the telescope was invented, astronomers were limited to objects visible with the naked eye. Objects like stars, planets, comets and nebulae.

Nebulae (or the singular nebula) referred to fuzzy spots in the night sky—no one knew what they were.

One of these nebulae was Praesepe (also called the Beehive). In the early 1600's Galileo looked at this object with a telescope. He saw it was a group or "star cluster" of 40 stars. Galileo was convinced that all nebulae would eventually turn out to be star clusters. He was only partially correct: as telescopes improved more nebulae were discovered; many nebulae were examined and eventually resolved into star clusters, but other nebulae never resolved into clusters.

Galileo did not anticipate everything. There are dozens of stars in the constellation Centaurus, none of which seemed unusual. At least not until the year 1677, when Edmond Halley looked at the star named Omega Centauri with a telescope—the image was too fuzzy to be a star. He concluded it was a nebula. The stars in the constellation Tucana also seemed ordinary. In the year 1751, Abbe Nicholas Louis de Lacaille looked at one of these stars (47 Tucanae)—it was too fuzzy to be a star as well.

A number of other astronomers, including Pierre Méchain, Barnabus Oriani and Charles Messier, found new nebulae and/or were able to resolve nebulae into clusters. However most clusters would remain undiscovered until the 1780s. That's when William Herschel, his sister Caroline, son John and other family members started a systematic survey. They identified many star clusters (including some previously believed to be nebulae including Omega Centauri, 47 Tucanae and M13).

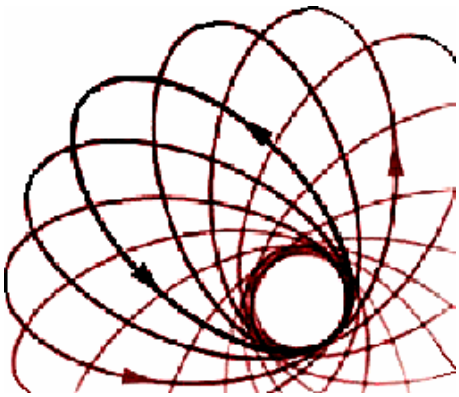
Globular Clusters

William Herschel divided star clusters into two subcategories, open clusters and globular clusters. Globular clusters have between 50,000 and a million stars; open clusters have less than 50,000 stars. (I won't say anything more about open clusters).

We now know of approximately 150 globular clusters in our galaxy and have found globular clusters in other galaxies (including G1 in the andromeda galaxy).

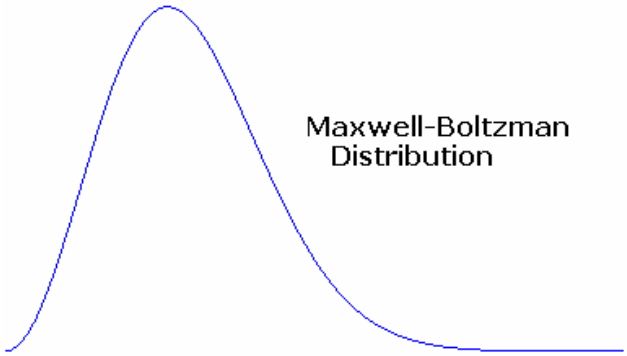
The globular cluster generates a gravitational field. If a million stars reside inside of a gravitational field, those stars must move. These motions cannot be predicted by the simple methods I explained in part 2, but astronomers have found an alternative, models that provide a rough guide to the motions.

A typical model goes something like this: all stars in the cluster move in Kepler orbits around the center of mass. The Kepler orbits undergo precession because of the influence of the other stars (there is precession in our solar system, but is more pronounced in a globular cluster). This picture shows what the precession of a single star might look like:



Stars have energy. Some stars in the cluster have low energy; typically found close to the center, they move quickly. Others have high energy; typically found away from the center, they move slowly. (This might seem counter-intuitive, but that's the way it works). If a star has enough energy, it will escape from the cluster and move with an independent orbit through the galaxy.

If we plot the number of stars versus the energy with a histogram, we find a Maxwell-Boltzman distribution (Maxwell-Boltzman distributions are commonly found in large collections of interacting objects). That's a curve that looks like this:



So far this has been a qualitative description (a description without numbers). Suppose we want to know the average stellar velocity, the size of an average stellar orbit or the mass of the cluster. If so, we need something more. An astronomer can measure the radius of the cluster and the average stellar velocity and use something called the Virial equation to calculate the mass of the entire cluster (to be precise, the average radius and the average velocity dispersion are used). Once the mass is known, other calculations are possible (for example, it is possible to estimate the number of stars given the total mass).

While this model is a good start, it leaves unresolved issues. There isn't space to explain them all, but I can briefly explain two. First we would expect that stars within the cluster would from time to time interact gravitationally—in the simplest case two stars interact, one star loses energy and another gains energy. This happens often; orbits orbits change each time there is an interaction and there is typically an interaction every few orbits. Astronomers call these interactions "collisions" even though the stars never come into physical contact with each other. (Note, the term "physical collision" is used when the stars come into physical contact). The interactions are difficult to predict with any precision, the simple model offers no help.

There is another issue: If a star has a high enough energy (there always be a few high energy stars), it can escape from the cluster. A few of the stars remaining will have high energy, and some of them will escape. Repeat this over and over, eventually we would expect all the stars will escape. This is called "evaporation."

How long does this process take? This has proven to be a difficult problem. Astronomers have suspected that binary stars within the cluster hold significant amounts of energy and could affect the evaporation rate. Also stellar interactions also could affect the evaporation rate. Again the simple tmodel can't give us a precise answer.

To deal with these and other issues astronomers developed new models, but the details are beyond the scope of this article.

I'll return to globular clusters in a moment.

Galaxies

Astronomers had not finished with nebulae. In 1845 William Parsons noticed that M51 (believed to be a nebula) had a spiral structure. Soon other nebulae were shown to have spiral structures. They became known as spiral nebulae.

But the true nature of spiral nebulae wasn't determined until 1924. That year, Edwin Hubble found special stars called Cepheids in NGC 6822, M33 and M31. This work proved that spiral nebulae were massive collections of stars, similar to the collection of stars we live in (the Milky Way). These collections became known as galaxies (the term spiral nebula was soon dropped in favor of a new term "spiral galaxy"). Soon Hubble and other astronomers discovered additional galaxies. Not all galaxies are spiral; we now recognize four basic types of galaxies: spiral, lenticular, elliptical and irregular. (NGC 6822 is an irregular galaxy; M33 and M31 are spiral galaxies).

Stars in a galaxy move around the center of mass in Kepler orbits (not unlike the stars in a globular cluster). This is somewhat similar to a globular cluster; however stellar interactions are much less common and stellar motions in spiral galaxies have some interesting complications.

To analyze a galaxy, astronomers use an equation called the Jeans equation. Some sections of the galaxy have lots of stars (lots of mass per volume or high density); other sections have few stars (little mass per volume or low density). The Jeans equation allows you to calculate the expected velocity of stars in a region based on the density in that region (stars move fastest when the density is highest). And you can go the other direction: calculate the density based on the velocity of the stars.

Galaxies can be found in groups called galaxy clusters. The Jeans equation works for galaxies in a galaxy cluster just like it works for stars in a galaxy.

Fritz Zwicky was the first person to use this approach. In the 1930's he created a catalog of galaxy clusters. He used the Jeans equation to compute the expected velocities of galaxies and compared the results to velocities computed from Doppler shift measurements. Despite what anyone may have thought, the actual velocities were higher than the expected velocities, a strange result that required an explanation.

Zwicky proposed a solution: Some substance, which was named "dark matter," caused the density to be higher than was thought and in turn caused galaxies in a galaxy cluster to move faster than expected. When individual galaxies were examined the same problem showed up; dark matter was again suggested as a solution.

Computer Models

There were limits to what these methods could accomplish. Recently a new approach has shown promise.

With collections of stars (like globular clusters and galaxies), it is theoretically possible to calculate the effect of Newton's laws on each object. Until a decade or so ago, this was impractical for objects as complex as globular clusters and galaxies (that's why the previously mentioned approaches were used). Clever methods and fast computers developed starting in the mid-1990s made it possible to perform computer simulations on these objects. In the process we have been able to

answer some questions about globular clusters and galaxies.

Do stars in a globular cluster ever physically collide? Astronomers used to believe physical collisions between stars were extremely rare and there probably has never been such a collision in our galaxy. However recent computer simulations suggest physical collisions happen more often than originally suspected. These collisions are most likely in crowded parts of the galaxy, such as globular clusters.

In the 1950's astronomers had discovered some unusual stars, called blue stragglers, which no one could explain. Recently an explanation emerged: blue stragglers could have formed as result of a physical collision between two stars. The computer simulations suggest that in a typical globular cluster, 1 out of 100 stars will experience a physical collision over the lifetime of the cluster.

How long do globular clusters last? Observations suggest that some globular clusters are 12 billion years old, and computer simulations suggest an average lifetime of 10 billion years or so (this suggests some clusters have already evaporated, and others will last another 10 billion years or even longer).

Why do galaxies have the shape they do? There have been theories almost as long we've known about galaxies. Computer simulations have allowed astronomers to test these theories.

References

I was forced to gloss over many details, if you want to read more about the topics covered in this article, you might try:

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2007 Calendar and Observer's Handbook Preorder

It is time to start thinking about 2007 calendars and Observer's Handbooks. I've begun to take orders at the September meeting. The ordering period will continue until October 31so that the items will be available for pick up at the November or December meetings. That will be just in time for giving Christmas or Hanukkah gifts. They will be from the Royal Astronomical Society of Canada (RASC). The price of the calendar is $13 and the Observer's Handbook is $22. These are based on our typical order quantities. If I get orders for more than 25 copies of the Observer's Handbook, I will drop the price by one dollar. We are currently at 17 copies. As usual, I'll only order as many copies of the OH as I get orders. I will order a few extra calendars to sell. You can e-mail me your order or preorder on the form at the October meeting. I will collect money when you pick up your order.

Kathy Hillig, Treasurer

A Bum Steer

by Doug Scobel

Not long ago, I mentioned in an email to the club that a local department store had 12 volt automotive jump starters on sale, and that they were perfect for powering any 12 volt accessory your telescope may need. Well, as it turns out, maybe not *any* accessory. Knowing that more than one of you bought these units upon my recommendation, I have to sheepishly admit that I unwittingly gave you something of a bum steer on that advice. Let me explain.

I brought my new unit with me to the Black Forest Star Party last month, for powering the drive and fan on my new six inch rich field telescope. I had tried it out several times beforehand, and it worked perfectly. But up in the mountains of Potter County, as predicted, we had severe dew on Wednesday evening, my first night there. Enough dew that the secondary mirror on the scope dewed up early on. Not to worry, all I needed was my 12 volt hair dryer/dew zapper and my new jump starter. I plug the hair dryer in and turn it on. It blows well for several seconds, and then stops suddenly. "It's never done that before" I think to myself. I turn it off, make sure it's plugged into the cigarette-style outlet securely, and try again. Again, it runs fine for a few seconds, and then quits. I jiggle wires, switch outlets, and still it will only run for a short while. "Now don't tell me my dew zapper is crapping out on me." I try it with my old battery pack and it works fine. "Hmmm." Back to the new jump starter. Same result. "Now this is getting *weird*." Then after unintentionally leaving the switch in the "on" position for a while, it turns back on. Then off. Then on. Off. On. It would run for about five seconds, and then stop for about five seconds. *"What the $%@#&* is going on???"*

Then I happen to mention it to Charlie Nielsen, who had purchased the same model as mine. "Oh, yeah," he says, "mine did the same thing. These new jump starters have a built in circuit breaker that limits the current coming out of the outlets to about five Amps. The breaker alternately trips and resets every few seconds." Ah-ha, mystery solved. Then he showed me how he got around the problem by hooking up a cigarette lighter socket to the main cable clamps that you would normally use to jump start your car. "Great!" I thought to myself, with the uncomfortable realization that I recommended these units to you all without knowing that they have a significant shortcoming when it comes to chasing dew.

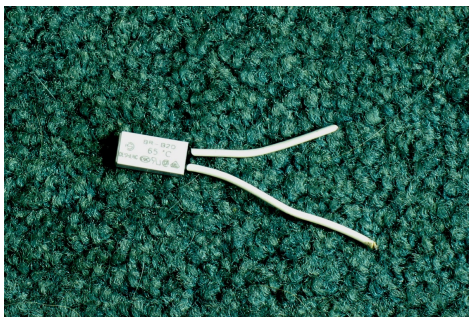


Fig. 1 – The culprit

Not to worry, though. We can rewire it. We have the technology. I didn't like the idea of connecting directly to the main clamps, since those are not fused and are connected directly to the battery. Any short circuit could do some real damage, and maybe even result in an explosion. So I decided to rewire one of the existing sockets. Once I got home, and after scrounging around in my workshop, I found everything I needed – some heavy connecting wire, a couple crimp-on terminals, a fuse holder, a soldering iron, and some solder. I cut out the circuit breaker and the existing wires going to the socket, taped the exposed end of the cut wire, and rewired away. I connected the main wires to the main battery terminals, and put the fuse holder in-line in the positive wire. Figure 2 shows the wires and the fuse holder I added. The 12 gauge wire I used is probably overkill for the job, but that's what I had on hand so that's what I used. After I wired it up I tried running the hair dryer with a 7 Amp fuse, which blew immediately. But a 15 Amp fuse would not blow, so I'm guessing that it's drawing around 10 Amps. The hair dryer is not labeled with any electrical info so I'm not quite sure. I'm now using a 20 Amp fuse for a little bigger margin, but it's still rated low enough to protect the battery should any kind of short circuit occur.

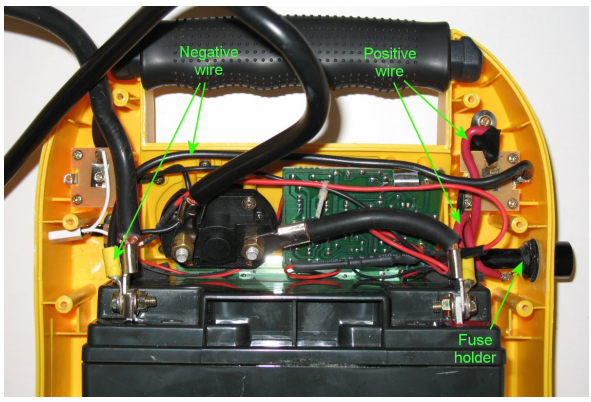


Fig. 2 – Internal wiring

And now a word from the lawyers. Should you try to do this yourself, *then before you do anything else, be sure to disconnect the internal wiring from the battery terminals!* The battery in these things can start a car engine, so they are capable of delivering a whole boatload of current nearly instantaneously. Literally hundreds of Amps. Use the same precautions you would use when working on your car's electrical system. And I'm very sure that this modification will void your warranty, too. There. You have been warned.

Fig. 3 – The finished product

Figure 3 shows the finished product. The only thing that belies my modifications is the fuse holder, which also helps remind me that the socket on that side of the unit is the one that's been rewired.

If any of you would like a hand in making a similar modification to yours, then I would be more than happy to help you out. It's the least I can do.

So let it dew – I'm ready!





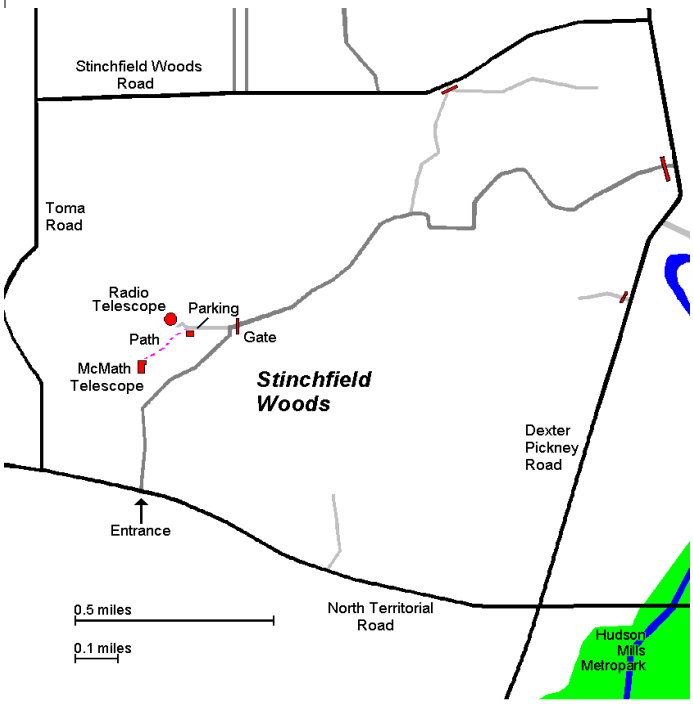




Places & Times

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 Kathy Hillig

7654 W. Ellsworth Road
Ann Arbor, MI 48103

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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Reflections & Refractions





The Faces of Black Forest Star Party 2006

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