University Lowbrow Astronomers
Ann Arbor, Michigan

REFLECTIONS / REFRACTIONS

University Lowbrow Astronomers

MARCH 2016
VOLUME 40, ISSUE 2

Fearless Leader Reports:

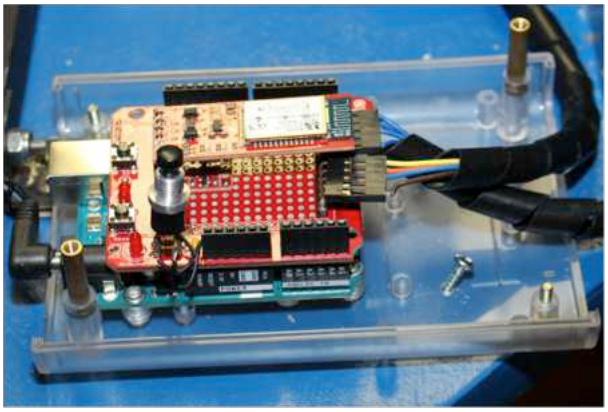
2015 In Review

By President Charlie Nielsen

The year 2015 was yet another eventful and productive year for our club. As I was wrapping up last year's report I was writing about our 17.5 inch telescope project and how the crew working on it was enduring a very cold and snowy winter. Last winter was overall not as bad as 2014 at least as far as snow goes. But the month of February broke all kinds of awful records. One night we hit thirty below zero! Actual temperature! At least that validates our decision a few years ago to not schedule open houses during the worst winter months.

We continued meeting in G115 Angell Hall, except for four months. One is our July meeting which we hold at EMU, but two other times we had to move to a different room in Angell Hall because our room was flooded. There has been a drainage problem brewing for some time and last year it happened. I heard that some correction was done outside the building, and the problem has not recurred since. I hope it stays that way since some people already may think we are all wet.

Our meeting speakers were as follows: January was Dr. Claude Pruneau from Wayne State University, who spoke to us about the latest findings from the CERN Collider. We had 27 in attendance. February was Dr. Carl Ackerlof (U of M), who did a detailed presentation about a "home-made" radio telescope project that he and some students built and used on the roof of Angell Hall. We had 29 attendees. March featured a presentation by our very own Vice-President, Don Fohey. We had 31 people show up to learn how Don designed and built a telescope encoder interface that could be used with many popular astronomy programs to locate objects. Since then several club members have used Don's design successfully. Thank you Don!



Don Fohey's Arduino/Bluetooth unit, uncovered. ***Photo: Don Fohey***

Our April meeting featured club member, Michael Meade. Mike did a presentation about a recent solar eclipse trip he took to the Faroe Islands.

Total Solar Eclipse over Northern Australia, 2012 ***Photo: Mike Meade***

The weather did not cooperate and he only got a glimpse. Mike also talked about upcoming total eclipses of the Sun, especially one coming up in the summer of 2017 that crosses the US. He is heading for a small town in western Kentucky. How many other Lowbrows will be going? April was also our annual officer's elections, with no changes from the previous year. We had 23 people in attendance. For May we heard a presentation from Dr. Emily Rauscher. Emily talked about the amazing amount of information we have gathered about exo-planets by closely observing transits of the planet across the host star. I think all 33 people watching were impressed with what we learned and how we learned it. We also had a short presentation by the U of M Museum of Natural History Planetarium Director, Matt Linke regarding their upcoming move into a new building. In June we had long-time club member Dr. Kurt Hillig, who spoke about a trip he and his wife Kathy took to Arizona. He had great pictures and of course much of it was astronomy related. This was one of the meetings we held in another room in

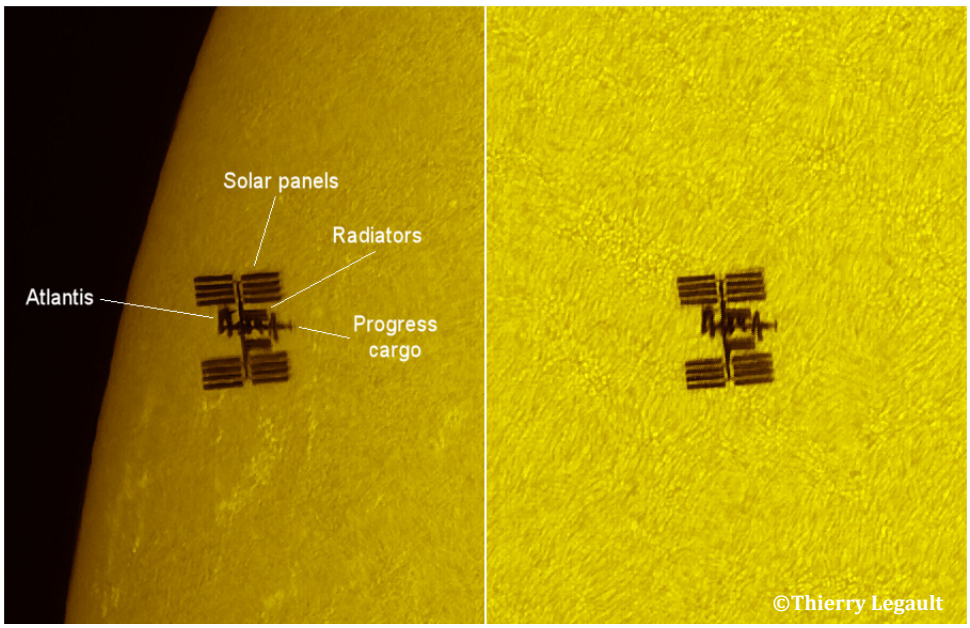
Angell Hall…above the waterline. All 24 attendees remained dry. For July we took our annual trip to Sherzer Observatory at Eastern Michigan University, to be entertained by Norb Vance. We usually have a larger turnout (this time 41) for this meeting. Could the free food have something to do with it? Our speaker was Professor Rudi Lindner who is from the U of M Astronomy and History Departments. Rudi has spoken to us many times over the years and this time he talked about many "what ifs" and "near misses" in astronomy history. We also had our usual planetarium demo by Norb, and we hoped to use some of the equipment for observing. But the weather did not allow it. We did have an excellent sunset at least.

Our August meeting brought us an excellent presentation by another long-time club member, Chris Sarnecki, who spoke about old and historic astronomical instruments, many of which he saw "live" in Europe. I think many people were on vacation since we only drew 14 for this one. Too bad because the presentation was great! This was our other meeting that we had to hold at a higher room in Angell Hall. September was headlined by club members Don Fohey, Doug Scobel, and others. They reported to 22 of us about their recent trip to the Black Forest Star Party, which several club members attend every year. Great job guys! The October meeting was a presentation by Dr. Ed Cackett from Wayne State University. Ed spoke about what happens when material falls into a black hole. The 23 people watching felt the "gravity" of the situation.

Lowbow and Sherzer Observatory Director gives Brother Guy Consolmagno a tour of the EMU facility after the November meeting. *Photo: Jason Maguran*

Our November meeting was the best attended meeting of the year. We estimated the turnout to be at least 175! We did some advertising and promotion and held the meeting at Strong Auditorium at Eastern Michigan University. Thanks again Nob Vance! We moved because it was the return of Brother Guy Consolmagno. This location had easier parking and was more convenient for our speaker, and could be shared with the EMU Astronomy Club. Br. Guy is now the Director of the Vatican Observatory (guess who his boss is) and he shows up in the media more and more every day. This time he spoke to us about what we have learned from asteroid Vesta and what it tells us about the formation of the solar system. We are truly honored to have a person of his fame speak to us. Brother Guy is a great speaker and has a great sense of humor. When I was speaking with Brother Guy before his talk he mentioned how much he likes our club and the people in it, and that he would be happy to be a regular speaker. You know what my answer to that was! Expect to see him every year or so in the future.

We wrapped up in December, which makes sense since it is the last month of the year. Our speaker was Thierry Legault who is a internationally famous astro-photographer. He also happens to live just west of Paris, France! We did a "Skype" connection, which did not work as well as some have in the past. The audio was not good but we could understand what he was saying after adapting a little. Thierry is a delightful person who has mind-boggling photographic skills. Much of his work is time-lapse aurora video, and video of the ISS transiting the Sun. The 25 people watching this were amazed and entertained!



Solar transit taken on July 15th, 2011 from France (Caen, Normandy), showing Atlantis docked to the ISS. Transit duration: 0.7s. ISS distance to observer: 520 km. Speed in orbit: 7.5km/s (27000 km/h or 17000 mph). *Photo: Thierry Legault*

Our open house season started 50-50 with our first March event being cancelled. But March 21 brought us excellent skies up till about midnight, and 40 guests enjoyed it. Well, yes, we enjoyed it too! We ran both open houses in April. Yes, that is three in a row, during spring, in Michigan! April 11 brought us

excellent skies all night, and 100 guests made the trip! The second April open house did not present great skies but we had 50 guests witness a great ISS pass and Iridium Flare. In May we batted 500. May 23 brought us 150 guests, many of them teens and children. We had good skies to show them Venus, Jupiter, the Moon, and various eye candy. June was not kind to us as we had to cancel both open houses and an event at Leslie Science and Nature Center. July and August were not friendly toward us either as we cancelled both July events and the first August event. Finally, on August 15 we entertained a turnout of about 60. We were back to 50% in September as we had only 20 guests show up for the second event. The sky started out cloudy but cleared later, which may have held back attendance. Our annual Astronomy At The Beach two-day, multi-club event was held on September 25 and 26. Friday night brought us a crowd with a great diversity of age, gender, and national origin. Saturday night was the same way. As usual it was at Kensington Metro Park and was very well attended by the public. We had an estimated turnout of 4000! In October we ran both open houses. About 60 showed up for the first one but only 10 for the second. As a shocking conclusion to our open house season, we ran both November events! The first one brought us just 35 guests, but in mid-November we brought out 100! What a way to finish! This was November in Michigan!

Last year was another busy one on the public outreach front with appearances at Camp Hazelwoods, The Hands-On Museum, Leslie Science and Nature Center, Downtown Ann Arbor, Abrams Planetarium, and Scio Farms Estates. We also had special events at Peach Mountain for Leslie Science and Nature Center and the Michigan Math and Science Scholars.

During the second part of last year I was contacted by U of M Astronomer, Pat Seitzer, and Director of the Hands-On Museum, Mel Drumm. They informed me about an agreement between them that would hopefully lead to a display of two “retired” U of M telescopes. If all goes really well at least one of the scopes would be brought back into use for public outreach at one of the old observatories on Peach Mountain. They asked us to be involved in the refurbishing and operation of the scopes. More on this is coming as we proceed through 2016.

At the end of the year we also discussed a large upgrade to the McMath telescope digital setting circle system. A budget was approved and as I write this much has already been done. Later this year we will see the scope have much better locating ability and it will have Wi-Fi and Bluetooth interfaces. Then we will be able to connect to our mobile devices. How cool!

As you can see, your club keeps moving forward and some big steps were taken last year. You may have noted the oddness to our open house success. We were good at the beginning and end, but had bad weather in the middle; at times when it is usually better for us. We make the most of it as we can, and nearly always have a great time.

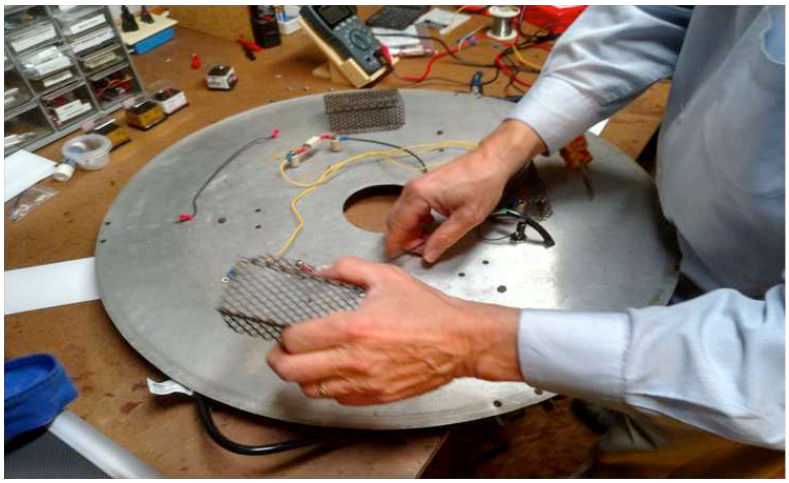
The Treasury is healthy and membership still near record highs. This year we designed and ordered official Lowbrow hats! Thanks for the fine work on that, Doug Scobel. We have two different types. I liked them both so much I had to buy both. Lowbrow shirts, Lowbrow hats…what next?

Lowbrows setting up at last September’s Astronomy At The Beach. How many of the usual suspects can you pick out? ***Photo: Doug Bock***
(Photoshop effort by the editor)

Repairing the McMath Mirror Cover's Dew Removal System

By Jack Brisbin and Don Fohey

While working on the 24" Mc Math telescope last year I was inspecting the mirror cover/dew shield and noticed the fuse holder was broken and the power cord needed to be replaced. I was trying to determine how much heat (watts) we get from the dew shield resistors. The other problem is the volume of air the dew shield has to heat up. The dew shield sits 19 inches from the mirror. So it has to heat up an area of a cylinder shape that is 25 inches in diameter and 19 inches in height. My concern was can this dew shield reduce the humidity/ moisture on the 24" mirror when you take into consideration the volume of air it has to go through. I was talking about it at a club meeting and Don Fohey offered to test the unit to figure out how many watts it put out, along with rewiring the fuse holder and power cord.

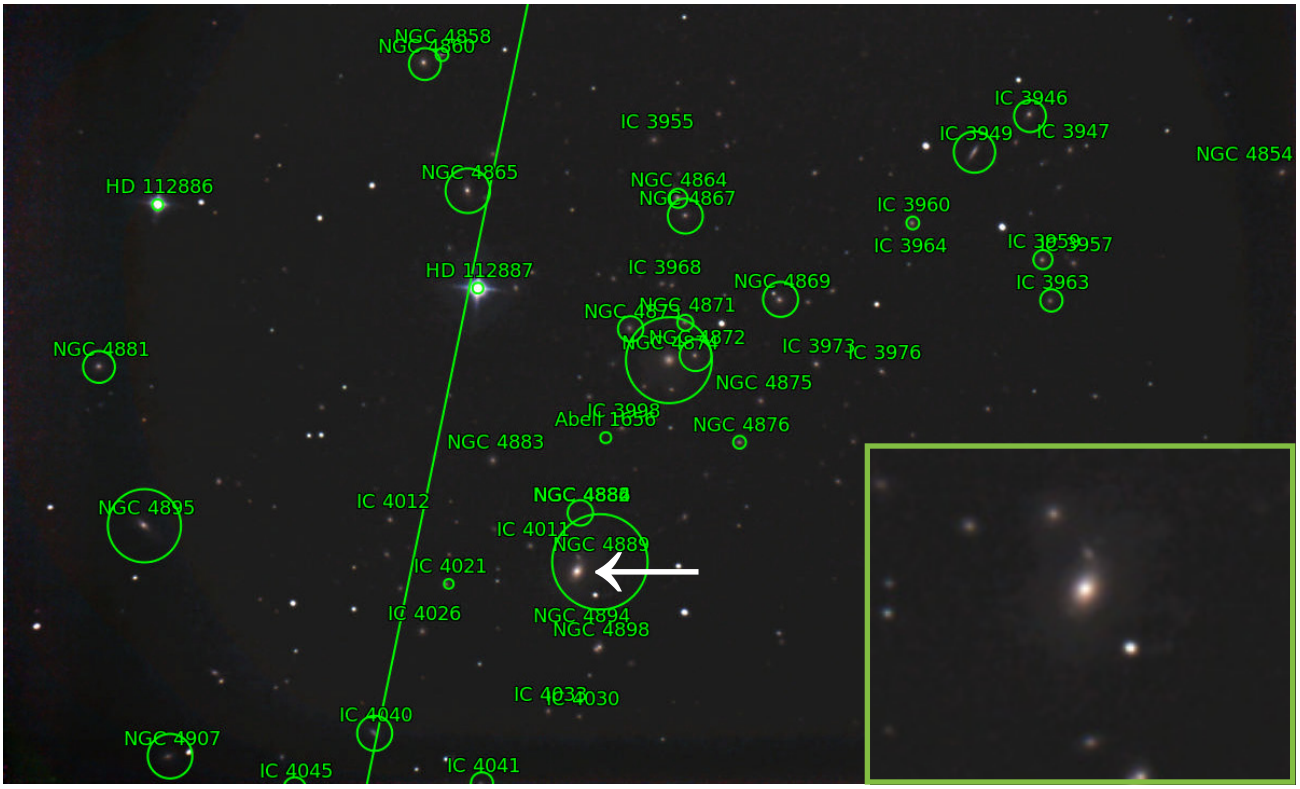


You can see the broken fuse holder and power cord. I picked up repair parts and brought the mirror cover / dew shield over to Dons house. He started to rewire the mirror cover and measured how many watts the shield produced. Well to our surprise the dew shield only produced 4.8 Watts of heat. It is the equivalent of a 5 watt bulb trying to reduce the humidity level in a; 25" dia. X 19" height cylinder shape. After a short discussion it was apparent that 4.8 watts is not enough heat to keep dew from the mirror surface. Don replaced the 3, 1000 ohm 5 watt resistors they only provided 4.8 watts of heat at 0.04 amperes. The 3 new resistors are each 220 ohm 10 watt resistors that provided 21.8 watts of heat at 0.182 amperes. This is 4.5 times more heat and may be enough to keep the dew from the mirror. The 1/10 ampere fuse was replaced with a 1 ampere fuse. The resistors are mounted just off center between the insulator post so that a second 220 ohm resistor can be connected in parallel to increase power to 43.6 watts if necessary. Something else we noticed were the screws that held the resistors in place, seemed to be loose. The screws threaded into standoffs. The thread depth of the standoffs were not deep enough for the screw to tighten against washer's and resistors. Washers were added to insure that the screws tightened against the resistors. It is unclear whether this caused an open circuit and contributed to the dew shield not heating properly. Never the less, it is now solved.

As you can see from below I used a temperature gage to measure the heat from the resistor. The heat measurement will vary depending how close you can get to the resistor. So it is probably hotter than the 170.8F. that it shows below. But then again there is the famous finger test. That is, you put your finger on the resistor to see if it is hot and working. This is sometimes referred to as the toasted fingertip test or burnt finger award.

The last picture on the bottom shows the mirror cover /dew shield being installed in the 24" McMath telescope and it has worked very well.

Lowbrow Photographs Light Around Massive Black Hole!!



The Space Telescope institute announced February 11 the discovery of the largest black hole yet found--21 BILLION solar masses located in NGC 4889, 300 million light years away in the Coma Cluster. Its event horizon is larger than the orbit of Neptune. To compare: The event horizon of the Milky Way's 4 million solar mass black hole would not approach the orbit of Mercury. There is a known direct relationship between the mass of an object and objects in its orbit: The larger the mass, the faster the orbital speed. Observations of stars' orbits near the center of NGC 4889 with the Hubble Space Telescope have allowed astronomers to calculate the mass of an object that does not emit light.

***Mike Radwick** took this wide field photo of a corner of the Coma Cluster through his 14.5" Starmaster Dobsonian with a Canon DSLR camera. The top photo is annotated to point out all the deep sky objects in the field. The inset at the lower right shows the immediate area around NGC 4889. Above, is the original photo.*

The chart shows the position os NGC 4889 at about 10:00 PM, Saturday, April 2, 2016--the date of this year's first Open House on Peach Mountain.

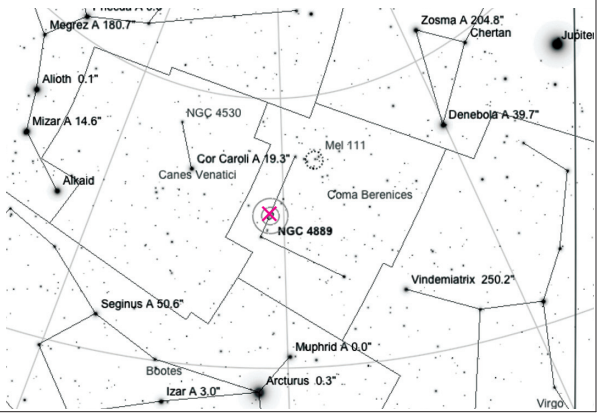


Chart drawn in Sky Safari

University Lowbrow Astronomers

1/15/2016 Meeting Minutes

The meeting began at 7:35 PM.

Pat Seitzer (Research Professor, University of Michigan Astronomy) and **Mel Drumm** (Director of the Ann Arbor Hands-On Museum) presented "The Fate of the Old Angell Hall Telescopes (a 10-inch refractor and a 15-inch reflector)." The Hands-On Museum is looking to restore the "Lost" observatory on Peach Mt. They hope to raise money for the observatory restoration, and possibly an additional building to be used for a retreat residence. They would like to have Lowbrow involvement with the project beginning with the restoration of the 10" refractor which could possibly be located into the "Lost" observatory. All these ideas are very preliminary at this time. The U of M and the Hands-On Museum are currently working to establish an agreement by which they can work together. Asked if any Lowbrow's would like to participate in the restoration of the 10-inch refractor. Several members raised their hands.

Ken Bertin (Warren Astronomical Society) presented "Galileo Galilei: The giant whose shoulders both Newton and Einstein mentioned they stood upon." His presentation covered the various discoveries that he made, important milestones and the people influential in his life.

Charlie Nielsen reported that he had arranged for Nebil Misconi, author of "An Immigrant's Journey Into the Cosmos" for our July meeting.

Doug Scobel reported 125 memberships and $6554.00 in the treasury

Jack Brisbin reported that he had picked up the club 17.5" telescope from the observatory and would make some slight improvements and repairs to it before taking it to John Causland's house so that it could be used during the winter at the ACNO events that he normally hosts.

Jim Forrester had sent an email explaining that the January newsletter will be coming out this coming week and that there are no articles currently in reserve for February. (Note: The January/February issue was emailed to the club February 20.)

His email also suggested that the club should be discussing plans for public events around the Transit of Mercury Monday May 9 and Astronomy Day May 14. Discussion took place about several possible locations with concern for the long duration, public access and facilities access. The Bus Stop on fourth, Hunt Park, Almandinger Park and Spring St. where all suggested. No consensus was reached and it was agreed that the various sites should be scouted and reported on for the next meeting. no one volunteered to manage an event. The discussion will continue at the February meeting. Publicity deadlines dictate solidifying plans by our March Meeting.

Dave Jorgensen reported that he had received the SkyBT and SkyWIFI modems for the McMath telescope.

Don Fohey reported that bench testing of the Argo Navis , SkyBT and SkyWIFI modems with Sky Safari would take place at his house on Monday. He also reported that he would reply to the Livingston County Libraries regarding their request to do a beginning astronomy program for teens and adults in March or April.

Dave Snyder will look into a report that the Lowbrow Application will no longer work with the newest Andriod release.

The meeting ended about 9pm

University Lowbrow Astronomers

2/19/2016 Meeting Minutes

The meeting began at approximately 7:30 PM in G115 Angell Hall.

The guest speaker was Dr. Ethan Siegel, Doctor of Theoretical Astrophysics and Professor at the University of Portland and Lewis & Clark College. We video conferred with him via "Google Hangout". Dr. Siegel graciously changed the subject of his talk from Pluto and Charon spoke about the Laser Interferometer Gravitational-Wave Observatory (LIGO) and the recent detection of a gravity wave. His presentation lasted about 45 minutes. He answered questions from members for about 30 minutes.

Officer Reports:

President Charlie Nielsen reported that two events have been added to the Lowbrow Calendar.

The City of Tecumseh will host an event to which we have been asked to provide the public with telescope viewing. He expects the location to be near the Tecumseh Airport. Details are being worked out.

The Lowbrows will host the Michigan Math Scholars at Peach Mt. again on Thursday July 7th. They generally have a group of 20 or so. A few volunteers will be needed.

Dave Snyder gave an overview of upcoming Saturday morning physics presentations.
Saturday, February 20—Dr. Keith Riles (UM Professor of Physics): "The Hunt for Gravitational Waves: Was Einstein Right?"
Saturday, March 12—Bibhushan Shakya (UM Research Fellow): "Higgs and the Beginning of the Universe"

Ken Rubel reported that he had turned over the Lowbrow banner to Doug Scobel.

Doug Scobel reported a membership of 128 and a balance in the Treasury of $6372.66
Doug also presented a plan to purchase more Lowbrow hats. He would order both the floppy and structured caps and the club would sell them for $18 and $20 as before to cover costs. He estimated the order to total about $300. Jack Brisbin made a motion to place the order for up to $300. The motion was passed by voice vote without dissent. (*Update 3/3: The new run of Lowbrow caps is in!*)

Don Fohey reported that the Brighton District Library had contacted the Lowbrows requesting a lecture with an astronomy theme in support of the "Livingston County Reads" selection " The Martian". Don and Jim Forrester visited the library and met with Jennifer Osborne and agreed on a program Monday April 11th from 7 to 8 PM. Don will develop and present a 10 to 15 minute historical overview of missions to Mars. A Lowbrow volunteer (to be named later) will present a 40 min introduction to astronomy. This will be a reduced version of material used in previous Lowbrow presentations. A 5 to 10 minute club overview will conclude the presentations. Weather permitting, a few Lowbrows will make telescopes available in the parking lot to observe Jupiter and the Moon.

Don also encouraged members to be a vice president candidate for the April elections.

Jim Forrester explained that he did not have enough material for a January newsletter and that he would publish a combined January-February issue. Jim will leave on an extended trip the Monday after the April meeting. He will be able to manage the publishing of the newsletter while he is away but will need someone to help him with the printing and mailing of the May and June newsletters.

Jim pointed out that volunteer coordinators are needed for Peach Mt open houses with the first of the season scheduled April 2 and 9. (Larry Halbert and Don Fohey are coordinating the April Open Houses. Contact President Charlie Nielsen if you are able to be Coordinator for any of the Spring 2016 Open Houses.)

Jack Brisbin reported that the testing of the encoders with the McMath telescope, the Argo Navis controller and the Bluetooth and wi-fi modems were successful. Graduated scales were used on the encoders and the system worked with Sky Safari on both Apple and Andriod tablets. The next step is to install the encoders on the McMath telescope which will likely wait until warmer weather.

He also explained that the officers were reviewing the telescopes and equipment in storage at the Observatory. He suggested that some of the telescopes such as the 6" Cave could be loaned to members for a viewing season.

Krishna Rao reported that the web and facebook sites were all doing well. He reminded the members that there is a Lowbrow blog that has had a recent post added. (http://lowbrows.blogspot.com)

The Witch Head in Winter

By Brian Ottum
(Text: Jim Forrester)

IC 2118, the Witch Head Nebula, is located about 900 light years away at the extreme eastern edge of the constellation Eridanus. The nebula is a super nova remnant of gas and dust reflecting the light of 0.28 mag Rigel, about 117 light years away. The blue-white giant star accomplishes this feat by being 17 times as massive as our sun and 40,000 times as luminous. IC 2118 spreads out over 180 x 60 arc minutes, diluting its magnitude 10 brightness several times at the eyepiece. A large scope (25") and a very dark sky are needed to bag any part of this giant cloud visually.

How Brian Did It:

Camera: Canon 5D mark III
Scope: 10" f/5 Taiwanese reflector with Baader field flattener
Mount: Paramount MX
Autoguiding: Orion StarShoot Autoguider on a William Optics 98mm APO refractor
A two-panel mosaic / panorama
Top half is 18 five-minute frames
Bottom half is 24 five-minute frames
Calibrated for flats/darks/bias with ImagesPlus
Each half aligned and stacked with ImagesPlus
Photoshop to precisely align the two halves
Endless tweaking in Photoshop
Site: Hildago, Co., New Mexico (SQM darker than 21.5--next stop outer space.)

Lowbrow Calendar

***Fri, March 18, 7:30 PM*--Lowbrow Monthly Meeting**--Room G115 Angell Hall, University of Michigan, 435 South State Street, Ann Arbor, Michigan--Vivienne Baldassar (PhD student, University of Michigan Astronomy): "Teeny super massive black holes."

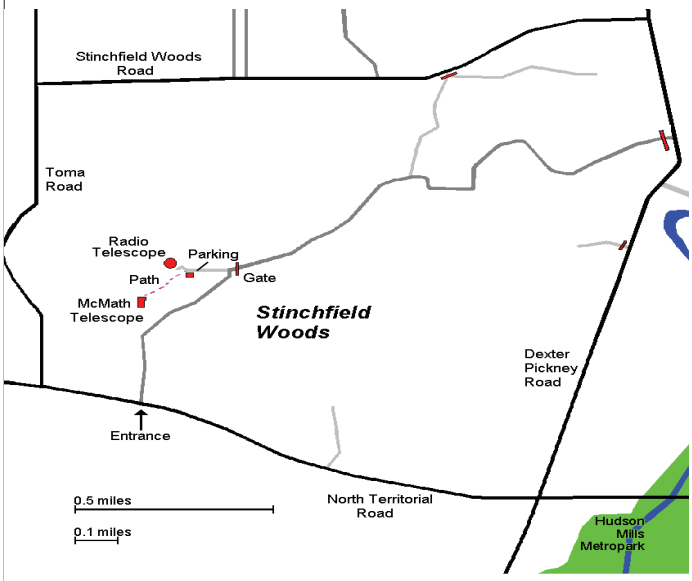
***Sat, April 2, and Sat, April 9*--Open Houses at Peach Mountain**--8:00 PM – 11:30 PM--May be cancelled if cloudy.

***Fri, April 15, 7:30 PM*--Lowbrow Monthly Meeting**--Room G115 Angell Hall, University of Michigan, 435 South State Street, Ann Arbor, Michigan--Eric Bell (Professor of Astronomy, University of Michigan & Director, Michigan Institute for Research in Astrophysics): "Lighting up Dark Matter," followed by the **Lowbrow Annual Meeting and Election of Officers**. Remember: Being absent from the Annual Meeting is no guarantee you will not be elected to an office!

Places & Times

Monthly meetings of the University Lowbrow Astronomers are held the third Friday of each month at 7:30 PM. The location is usually Angell Hall, ground floor, Room G115. Angell Hall is located on State Street on the University of Michigan Central Campus, between North University and South University Streets. The building entrance nearest Room G115 is the east facing door at the south end of Angell Hall. A club observing session at the Peach Mountain Observatory, weather permitting, often follows the meeting.

Peach Mountain Observatory is the home of the University of Michigan's 25 meter radio telescope as well as the University's McMath 24" telescope, maintained and operated by the Lowbrows. Located northwest of Dexter, MI; the entrance is off North Territorial Road, 1.1 miles west of Dexter-Pinckney Rd. A maize and blue sign marks the gate. Follow the gravel road to the top of the hill to a parking area south of the radio telescope, then walk About 100 yards along the path west of the fence to reach the McMath Observatory.



Public Open House / Star Parties

Public Open Houses / Star Parties are generally held on the Saturdays before and after the New Moon at the Peach Mountain observatory, but are usually cancelled if the sky is cloudy at sunset or the temperature is below 10 degrees F. For the most up to date info on the Open House / Star Party status call: (734)332-9132. Many members bring their telescope to share with the public and visitors are welcome to do the same. Peach Mountain is home to millions of hungry mosquitoes, so apply bug repellent, and it can get rather cold at night, please dress accordingly.

Membership

Membership dues in the University Lowbrow Astronomers are $30 per year for individuals or families, $20 per year for students and seniors (age 55+) and $5 if you live outside of the Lower Peninsula of Michigan.

This entitles you to the access to our monthly Newsletters on-line at our website and use of the 24" McMath telescope (after some training).

A hard copy of the Newsletter can be obtained with an additional $18 annual fee to cover printing and postage. Dues can be paid at the monthly meetings or by check made out to University Lowbrow Astronomers and mailed to:

The University Lowbrow Astronomers

P.O. 131446

Ann Arbor, MI 48113

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

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

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

For more information contact the club Treasurer at:

lowbrowdoug@gmail.com

Newsletter Contributions

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

Call or Email the Newsletter Editor: **Jim Forrester (734) 663-1638 or** jim_forrester@hotmail.com to discuss length and format. Announcements, articles and images are due by the 1st day of the month as publication is the 7th.

Telephone Numbers

President:	Charlie Nielsen	(734) 747-6585
Vice Presidents:	Dave Snyder	(734) 747-6537
	Dave Jorgenson	
	Don Fohey	
	Ken Ruble	
Treasurer:	Doug Scobel	(734)277-7908
Observatory Director:	Jack Brisbin	
Newsletter Editor:	Jim Forrester	(734) 663-1638
Key-holders:	Jim Forrester	(734) 663-1638
	Jack Brisbin	
	Charlie Nielsen	(734) 747-6585
Webmaster	Krishna Rao	

Lowbrow's Home Page

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

Email at:

Lowbrow-members@umich.edu

A NOTE ON KEYS: The club currently has one gate key. The officers are negotiating with the University for additional copies. The Observatory Director usually has this key. All three Key-holders have keys to the Observatory.

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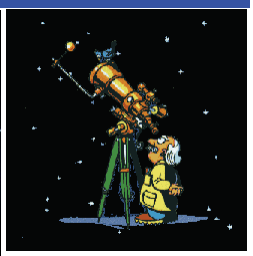
Reflections & Refractions



Website
www.umich.edu/~lowbrows/

John Manney writes: This is Shelby, my daughter's cat, checking out my new telescope. Fortunately, she didn't attack the stranger inside the tube!

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