REFLECTIONS / REFRACTIONS

University Lowbrow Astronomers

March 2020

VOLUME 44, ISSUE 3

Best Pairing of Galaxies

By Brian Ottum Ph.D.

Here's one of the best pairings of galaxies in our sky: M81 and M82. M81 (left), Bode's Galaxy, is a grand design galaxy. M82 (right), on the other hand, is very troubled. The gravitational pull from M81 have caused "starbursts," formation at a rate 10X our galaxy. Frequent supernovae blast out "superwinds" from the center. Radio astronomers have recently observed radio waves coming from M81 that are unlike anything seen anywhere else in the universe. The best guess is a dense object accreting surrounding material, either a large black hole or a black hole in an unusual environment. You can see galaxies down to mag 20 in this image. Just above M81 you can see a companion dwarf galaxy called Holmberg IX or UGC 5336. It is mag 16.5, and very young (just 200 million years old).

TECHNICAL DETAILS: Remote control 10" f/5 reflector on a Michigan-made PlaneWave L-350, Canon 5DmkIII (modded). 110 separate 5-minute exposures taken Jan 31, Feb 1 and Feb 2 – total of 9 hours of exposure. More important than the equipment is the post-processing. Here are the steps:

- Convert the 110 frames from Raw to Fit format
- Calibrate the 110 frames with a master FLAT frame (uniformly white, to remove dust spots and vignetting)
- Calibrate the 110 frames with a master BIAS frame (1/10,000 second exposure to remove base level of sensor read noise)
- Calibrate the 110 frames with a master DARK frame (five minute exposure with the telescope covered, to remove dead pixels)
- Align the 110 frames, Stack/combine the 110 frames into one
- Convert from Fit to Tif. Send file from New Mexico to Michigan
- Set black points in Red/Green/Blue, Set white points in R/G/B (the bright star cores should just about hit the max)
- Adjust the histogram of R/G/B separately, dozens of tweaks
- Do some noise reduction, Bring out colors that are there but muted
- Slightly increase contrast of interesting zones
- Fix blemishes, Crop, convert to small jpg

Comet C/2018/T2

by Doug Bock
Northern Cross Observatory

Doug wrote in an email to members. " I've been following this comet since October, but this is the latest 5 nights put together in this mosaic. Nights of February 14, 16, 20, 22, and 23, 2020. Each panel is 5 x 60 seconds light frames. 10" f/8 RC. ZWO asi071mc PRO, gain 300"

Horeshead Nebula –Downtown Astrophoto

By Federico Spotti

In an email to members on Feb. 24th Federico Spotti wrote.

"More than common subject and not enough time to image it correctly (just over an hour of integration time from downtown Ann Arbor) but I find the result is pleasant enough to share it...

Usual equipment... Asi294 pro, Newtonian 153mm F4, IDAS NB1 filter, ioptron cem25p"

First Rosette And Orion Nebula pictures

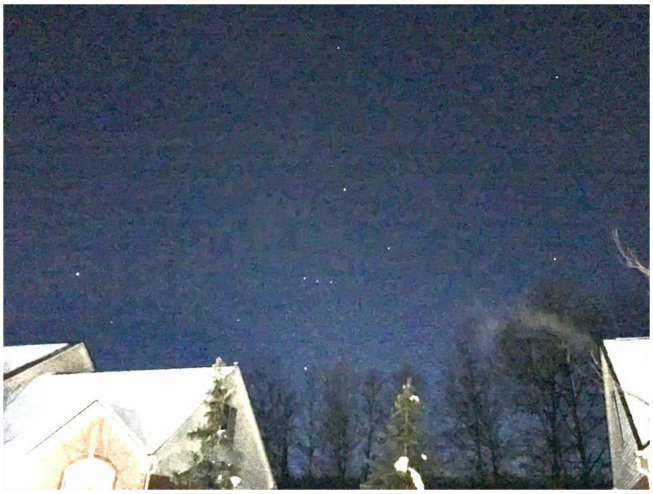
By Abe Oraiqat

Abe Oraiqat wrote to members email on Feb 24th.

"My first Orion (and horsehead) and Rosette pic! The Orion one is a stack of 32, 1 min sub frames. The Rosette was 32, 2min subs. This is in a VERY light polluted area (see the flood light in the background of one of the attached pictures). I used an ASI071MC-Pro (cooled to -5deg C and a gain of 90) on an iOptron Skyguider Pro. I used an Oshiro 135mm lens @ f/4. I also used an Optolong L-Enhance filter. Processed in DSS/Photoshop. I will improve the processing over time. (No flats or bias frames, just dark frames)"

Some Musings on our Night Sky (and the Fight against Light Pollution)

By Adrian Bradley, 2/17/2020



While coming home one night in March, 2018, I pulled out an iPhone 6S Plus and aimed it at the Winter Circle (also known as the Winter Hexagon). To my surprise, I managed to capture most of it's stars. Procyon and Castor are missing (red giants) but Betelgeuse appeared. So I'm not sure why two of the stars didn't come out, other than it was shot handheld with an iPhone and those stars' light wasn't quite bright or luminous enough to be caught by the tiny sensor...

A very rough shot, indeed. But if you ever tried taking pictures of the night sky with your smartphone a couple years ago, you found it difficult if not impossible. This also represents what many of the public will get used to seeing in this region of the night sky. There is a lot more going on in this region, as the next photo illustrates

This was taken from Lake Hudson Dark Sky preserve and State Park, near the boat launch. It's an eye opener for anyone who has never seen what this region truly looks like under dark skies. But this is what we as starscape photographers, astro-photographers, and long time observational astronomers are used to seeing when we go out of our way to enjoy what the night sky truly looks like.

Of course these photo comparisons are more like comparing apples to oranges, since different equipment was used and a different location was chosen for the more detailed photo. But the point here was to illustrate the challenge we have at every open house and public event. It can also remind us of one reason we fight to reduce light pollution. There are fewer and fewer places that are easily reachable where a night sky can be viewed like this, naked eye. Even at Lake Hudson it took a long exposure picture to reveal more Milky Way detail.

The fight against light pollution isn't just to preserve night skies like this. It's also to preserve the usage of energy by choosing lower-wattage options. It isn't anti-lighting at all, it is about shining the light where it should be shined - down towards us to reduce the shadows caused by bright, wide ambient lighting. Concerns about bright lights providing safety can be even better taken care of when shadows are eliminated in which muggers and other criminals can hide in wait for a victim.

Here's a sobering thought: Imagine not being able to detect dangers heading for the earth because the lighting gets to a point that we can't detect an asteroid coming when it's at a magnitude of 12 or 11... and we end up picking it up until it's close enough to the earth to become as bright as the star Sirius. If it's an Armageddon-sized asteroid or comet then we may not have enough time to react to save ourselves as a species.

For more information on the fight against light pollution in the state of Michigan, see https://sites.lsa.umich.edu/darkskies/. I also recommend for those who haven't visited a dark sky park yet, go see Lake Hudson State Park and Dark Sky Preserve for yourself in Clayton, MI. It is a beautiful park with camping facilities, a beach area, and a picnic area that is open for dark sky observing all night, year round.

2019 Year in Review

By Charlie Nielsen

The year 2019 was a year of intense demand for our club's services, as you will see from the number of events that we attempted to do. There were times when I was trying to plan and schedule 3 or 4 events simultaneously. At one time in the early Spring I got an email from another club that was asking for help with events from other clubs. The claim was they were getting more requests than they could handle. I had to chuckle a bit because they were asking for help, and I was wondering if we needed to ask for help. That club was getting more requests than they were accustomed to, and like us, the largest number of requesters were Libraries. For whatever reason, last year was also the hardest one to deal with as far event request planning because a large number, maybe majority of them did not communicate well, so I had to extract information out of them. Often there were large gaps of time before I got a reply from questions, but when *they* asked a question, an immediate reply was expected. For this reason Adrian Bradley and I developed a form that I now send to event requesters to ask them for the information we need. I eventually had to start turning down some events because I could not get enough (or any) commitments from club members and or we had no weekends left to book them. In one case someone asked for a whole series of weekly events at his house for his family and a few invited friends and neighbors. That one definitely got turned down, but it did leave me wondering what some people think our club is all about. Membership through the year varied between 150 and 155, but that was not enough to keep up with demand for our time. Of course, many of these events got cancelled due to weather, but if you are committed to help with an event you need to block off that time, and most of the time we do not know if we need to cancel until it is too late to draw up significant other plans for that time block.

We did not buy or build any telescopes in 2019, but late in the year Jack Brisbin got a crew together to scrape the rust off the metal parts of our observatory building and repaint it a very nice shade of blue. I believe Jack plans to paint the cement parts this year.

We continued holding our monthly meetings in G115 Angell Hall, except for our July meeting which we hold at Eastern Michigan University. That is a tradition that we started many years ago to avoid the Art Fair and the massive parking problems it causes. It turns out that we had so much fun there that we decided to do it even in the rare years when Art Fair and our July meeting do not clash. But this year we had to hold several meetings in Mason Hall because G115 was being renovated. When we returned we found the room arrangement was turned 90 degrees and we had "stereo" video screens and projectors. I do not see much improvement or advantage over the previous design, but then they did not ask our opinion before they did it. Considering the very low rent we pay (0), I guess we should not complain.

Our meeting speakers were as follows:

January was our first meeting of the year, in the traditional fashion. Our speaker was Dr. Fred Adams and his talk was titled "Planet Nine from Outer Space". Fred is especially good at taking complex concepts and explaining them so that most people can understand. This was another example as he made his case for the suspicion of a ninth planet based on the known orbits of Trans-Neptunian Objects. Fred is a regular speaker for us and we enjoy his presentations every few years. This was another good one. We had 40 people in attendance.

February brought back to us, David Austerberry. What I mean by "brought back" is that David is a club member that went pro; got a job with JPL; and moved to the Los Angeles area. David spoke to us in February of 2018 about his adventures during his first year of employment for JPL as a high altitude synthetic aperture radar operator. This proved to the 26 attendees that Lowbrows can make it to "high" places! We used a Blue Jeans remote connection for his talk. I guess you could consider this talk a sequel to his last one, but unlike most movie sequels, both were very good.

March featured Tom Drummond, who spoke about "Orion's Quest Program", which is a hands-on education program for 4-12 grades. In this program the students meet and work with professionals involved in International Space Station experiments. They crunch the data that comes from these experiments, along with the ground based control experiment, and provide it to the researchers they are working with. We had 23 people there.

2019 Year in Review Continued

April was a return of another repeat speaker, Wayne State Professor Claude Pruneau. This time Claude spoke to us about the future of energy production, consumption, and transportation. It was a very detailed presentation and one that he is still developing. I guess you could say we were a beta test. April is the month we hold officer elections, and we had one change this year. Joy Polling became our newest Vice President! We had 27 people show up for the meeting.

May had 36 people present to hear a very good presentation from yet another regular speaker for us, and one of the most famous. Br. Guy Consolmagno spoke to us this time about the art of story-telling in science, religion, and science fiction; and how it is used to get their respective messages out. "The Art of Story-Telling in Science, Religion, and Science Fiction" was done via Skype between Ann Arbor, Michigan and Tucson, Arizona. If I remember correctly, the weather here was not very good, but Br. Guy's weather…well, he was in Tucson, alright?

June brought us an excellent presentation by Dr. Zachary Constan from Michigan State University. Zach works with MSU's cyclotron, which is being used to produce and study "fantastic nuclei". These are isotopes that are produced inside stars and decay very rapidly. Zach was very enthusiastic and had a great sense of humor, which made this an excellent presentation...and may result in a club field trip to his facility someday. There were 31 people there to enjoy it.

July was our annual trip to Sherzer Observatory at Eastern Michigan University, to be entertained by Norb Vance. We usually have a larger turnout (this time 32) for this meeting. Could the free food have something to do with it? This time we had a presentation about Mercury exploration from U of M Professor James Slavin. After the talk Norb gave us a quick tour of EMU's very recently rebuilt Strong Hall, which houses the Physics, Astronomy, and Geology departments. It is very impressive. The weather prevented us from enjoying any observing at Sherzer Observatory, but it was already a full and fun night.

August brought us a speaker glitch. Our scheduled speaker suddenly got a job in Boston and had to move. But to the rescue came club member Jeff Kopmanis, who filled the gap with a very good presentation on how to get started in astrophotography. I think that the 38 people there would agree that Jeff did a great job!

September was very special because we got a demonstration of the new planetarium at the U of M Exhibit Museum, which is housed within the new museum building. Manager Matt Linke showed us what his new equipment can do. It was impressive and a big technical upgrade from their previous planetarium. We stuffed 38 people in the dome to witness it.

October's meeting was not just special, but very satisfying for me personally. That is because I enjoy meeting and getting to know famous people. When I can bring them to our club that is frosting on the cake. Such is the case for a former Lowbrow President gone pro, Dr. Dan Durda. I have seen Dan on television many times over the last several years, and continue to. Knowing that he was our club president back in the 80's (before I was a member) I thought it would be really cool to have him speak to us some day. He currently lives in Boulder, Colorado, so I knew this would be tricky. But hey, I miss every shot that I do not take! So I went for it and found it was easy to get him to do it. In fact, I had not finished the sentence before he said yes. Turns out he was as pleased as I was. Our first attempt got aborted by a project that came up, but we tried again and succeeded. Dan planned a trip back home to speak to and meet us (and some old friends), and take some vacation time up north. His talk was about asteroids and impacts. It was just like watching him on a documentary, except he was live before us. The 33 attendees had a "smashing" good time.

November brought us a fine presentation by U of M Professor, Dr. Xianzhe Jia, who spoke to us about the evidence for a water plume on Europa, and some insight on upcoming missions to learn more. I think many of the 19 people attending contemplated the possibility that we could discover life there. Xianzhe did a presentation for us several years ago, and I noted that he did not look like he aged a day. Must be nice.

December was a presentation by Professor Monica Valluri about hyper-velocity stars and how they got that way. Some of these stars are traveling so fast, they are leaving the galaxy! Monica is also one of the two Professors that bring us the Michigan Math and Science Scholars, who we entertain and teach at our observatory every summer. We had a turnout of 28.

2019 Year in Review Continued

We started our open house and event schedule for the 2019 season on March 9 with a type of event we are familiar with, but at an unusual venue. OK, so you are thinking that March 9 is no time to start events and expect good weather, but we were doing this inside Briarwood Mall. Now you think OK, the weather is not a factor…yet it was. The drive there was miserable because we had rain and freezing rain and visibility on the roads was horrible to say the least. Then we had to get equipment out of our vehicles and inside the mall during driving rain and ice, and where we had to enter and where our spot was to set up were on opposite ends of the mall. Then at one point while we were operating I got hit in the head with a rain drop! That is because we were under some skylights and it was raining so hard that they sprung leaks. At least none of them were taking aim at our stuff. The event was a Girl Scout camping and shopping event. They camped out in various locations and stayed all night. Many of the stores were open till midnight or so. Various groups had demos and such set up for them to check out. We had telescopes, our laser optics kit, meteorites, and a 3D planetarium simulator. Though we had about 100 of them check out our setup, most were not all that interested. I think we packed up around 2 AM. Helping with this event were myself, Joy, Jack B., Jeff K., and Adrian B. On March 30 we attempted to run a Messier Marathon, but the weather took it away from us.

In 2018 we had every open house cancelled due to weather all the way until June! 2019 started out better because we were able to run open house number one, on April 6. Adrian Bradley was our OHC and filed the following report: We had 65 people attend, along with Lowbrows Jack Brisbin on the McMath, Jim Forrester on the 17.5", Ken Ruble with his 10" don't, Joy Poling with her insight and vast knowledge of celestial wonders, Charlie 'Charles in Charge' Nielsen, Fredrico Spotti (and his wife Elena) with their small but very effective portable astrophotography gear, Krishna Rao showing the night sky to his and family/friends, and Kimberly and Lexie Luff with the late Marc Cray's 10" DOB and his "famous" refractor. We had arranged for members of the Ann Arbor Optical Society to join us at this open house and about 10-15 showed up. On April 27 we tried for open house #2 but rain stopped us in our tracks. Well, not completely because we had a concurrent (and we try to avoid doing that) event at Leslie Science Center. Though it was raining at the time, Adrian Bradley and Federico Spotti showed up and set up their telescopes in a building to show about 30 kids and parents how they worked.

May 4 was our next scheduled open house and we were able to do this one. Yours truly was our OHC and I was aided by Jack B., Joy P., Mike R., Ken R., and Adrian B. We also had a member of the FORD club and her daughter attending and showing our guests objects with their table top reflector. The sky varied between partly and mostly cloudy and we never had very good transparency. However, steadiness was excellent. Too bad we did not have planets to view. We showed our guest what we could, when we could. About 30 members of the public showed up. This was our only open house or event of the month other than our club meeting. But was this the calm before the storm? Read on to see.

June had a heavy schedule of events, but it started out with the open houses scheduled for June 1 and 8 being erased by the weather. But just two days later, on June 10, Jeff Kopmanis represented us at Cromaine Library in Hartland. He did a presentation about navigating the night sky and getting started in astrophotography. He reported 14 in the audience, which for how the daytime library events go is pretty good. On June 22 we made a return trip to Hidden Lake Gardens. This was our second year at this venue and we had much better weather this time. The sky remained clear until the end, and then clouded up as we packed up. We showed the guests Jupiter, Saturn, and a variety of DSO's. The crowd of 79 was very pleased! Club members helping were Charlie Nielsen, Jim Forrester, Jeff Kopmanis, Clay Kessler, DJ Roberts, Kurt Hillig, and Awni Hafedh. This is not only a very scenic setting, but the sky is at least as dark as Peach Mountain. Actually I think it may be darker. The Michigan Math and Science Scholars made their annual trip to Peach Mountain on June 25. The forecast was good, but clouds moved in just before sunset and ruined the event. However we did show the students the U of M radio telescope and the McMath Observatory and telescopes, and answered questions. Lowbrows helping were Charlie, Jim F., Jack B. and Shannon Murphy (Astronomy Dept. Outreach Coordinator) and her husband Joe. We also had an appearance by John W, and Abe O. The 20 students were led by Professor Dragan Hueterer. We finished June on the 29th with an open house led by Jim Forrester. About 30 members of the public showed up. Predicted clear skies were not that good. It varied from partly to mostly cloudy. But we managed to show Jupiter, Saturn, and some DSO's. Club members helping were Jim Forrester, Joy Poling, Jack Brisbin, Charlie Nielsen, Adrian Bradley, Mike Radwick, Ken Ruble, Federico Spotti, and Norb Vance.

2019 Year in Review Continued

We stated July with an open house on the 6th, but the weather snatched it away from us. On July 10 Don Fohey did an indoor presentation about the New Horizon's mission to Pluto and its discoveries, at the Brighton Library. This was followed by telescope viewing outside. Club members helping were Don Fohey, Alex Mangani, Jim Forrester, Chuck Steel, and John Wallbank. About 25 people attended. We had an event scheduled at the Ann Arbor Hands On Museum on July 20. We were hoping to show the Sun, but three things stopped us; clouds, extreme heat, and the fact that their event was in the middle of the Art Fair, which made parking pretty much impossible. We tried another open house on July 27. The evening stared out mostly clear but soon turned mostly cloudy. Despite that and low transparency, we did get very good views of Jupiter and Saturn, and a few brighter DSO's in the holes in the clouds. OHC was Don Fohey. He was assisted by Larry Halbert, Mike Radwick, John Wallbank, Dave Cook and his daughter, Jack Brisbin, Chuck ?, Charlie Nielsen, and Jim Forrester. We had about 60 guests. To finish July, I showed up at the Dexter Library for a presentation on how our eyes work, how telescopes work, and how our eyes and telescopes work together. I explained the three types of telescopes used by amateur astronomers. Then I spoke about astronomy that can be done without a telescope or is better without a telescope. This was on July 29 and about 15 people showed up; one of which later joined our club.

On August 3 we did an open house and had clear and steady skies. We showed about 100 guests Jupiter, Saturn and a variety of DSO's. OHC was John Wallbank. Club members helping were Ken Ruble, Dave Cook, Don Swetzig, Federico Spotti, and Adrian Bradley. We had several guests bring telescopes and set up along with us. Just a few days later, on July 8 we did presentations for two different libraries on the same day! Brian Ottum showed up at Saline library to do a presentation about astrophotography. A total of 3 people attended, but were enthusiastic. Meanwhile, John Wallbank and Adrian Bradley took on Milan Library for a general astronomy presentation followed by observing outdoors. About 45 people attended. Odd that the smaller city drew a much larger group. Then just two days after that, on July 10, I found myself at Salem-South Lyon Library for a presentation and demonstration of how our eyes and telescopes work and examples of astronomy without optical aid. I had a huge crowd of 9. We had an event scheduled for Leslie Science and Nature Center on the 17th, but issues at the site caused its cancellation. On July 24th we held an open house with Don Fohey as OHC. We had about 60 guests for very good sky conditions for viewing Jupiter, Saturn and a variety of DSO's. Club members helping were Charles Nielsen, Chuck Ward, Joy Poling, Adrian Bradley, Liz Calhoun and Margaret, Jim Forrester, Barry Wissman, Ken Ruble, John Wallbank, and Mike Radwick. We tried for another open house on the 31st but had to cancel it.

September 13 and 14 were the dates of our annual multi-club event at Island Lake Recreation Area, Astronomy At The Beach. About 400 guests came out Friday night, and 3000 on Saturday night. Good thing there were 76 telescopes set up. On September 21 we had an event scheduled for Rolling Hills Metro Park, but oddly, they moved the event to Whitmore Lake. Adrian Bradley made the trip only to see clouds roll in right away and ruin the event for the 15 people there. The event was originally scheduled for September 7 but they moved it to an open house date. Just as well since the weather was bad, resulting in cancelling the open house for the 21st too. We also had to cancel the open house scheduled for September 28.

We had a third trip planned to Leslie Science and Nature Center on October 5th, but the site issues made us cancel it. We also had to cancel an event at Tecumseh Parks and Recreation for October 12. On the 19th John Wallbank managed to show brief views of a few brighter objects to a Girl Scout group despite the apparent hopeless conditions. John stated that 10 Girl Scouts attended. Our open house that was scheduled for October 26 got stepped on by the weather.

Usually the event schedule starts to cool off to zero about now, but not this year. We started November by cancelling the open house for the 2nd. Brian Ottum was going to make an appearance at Salem-South Lyon Library on the 4th, but the weather bit that one too. Then on the December 10 Don Fohey did a presentation about the New Horizons Mission and Jack Brisbin brought telescopes to demonstrate, for a group of 8 at Westland Library. Finally, on December 20 we had an event at Independence Lake County Park, managed by VP Adrian Bradley. His report: I set up my scope and got goto working. I showed about 20 enthusiastic attendees views of M15, M31/32, NGC457, M38, NGC869/884, and M42/43. Most views were not spectacular due to the haze, but the public enjoyed them and asked plenty of questions about the DSOs as well as how my telescope works.
(CONTINUED PAGE 10)

University Lowbrow Astronomers

Monthly Club Meeting Minutes

21 February 2020, 7:33pm, Room G115 Angell Hall

President Charlie Nielsen called the meeting to order and then introduced our speaker.

Speaker

Who

Professor Michael Liemohn, Director of the University of Michigan Space Institute

Details

Mars Atmospheric Loss

Approximately 10 minutes of questions followed. Then Charlie came forward and thanked our speaker. A short break followed.

Business Meeting

Name	Topic
President Charlie Nielsen	Brought forth Jim Forrester's proposal. ***"The University Lowbrow Astronomers agree to purchase the late John Causland's 60mm Coronado Hydrogen-alpha telescope, along with its tripod, mount and Hyperion zoom eyepiece for $800, make Debbie Smith a Life Member and custodian of this equipment, similar to arrangements with other members holding delicate or easily lost gear."*** Motion for purchase was made by Adrian Bradley and seconded by John Wallbank. A membership vote followed and the proposal was *adopted as written* by a majority vote. Notice of this proposal had been emailed to the membership on 14 February 2020. All members were encouraged to attend especially if you had a strong opinion one way or another. Was happy to have so many volunteers for upcoming events. Has been contacted by 2 students that are also Dark Sky members and they are writing up a resolution that would have the University comply with the new lighting regulations that the city of Ann Arbor has. They would like the club to endorse this and particularly its president. Prior to contacting them he wanted to make sure no one objects to endorsing this.
Vice President Adrian Bradley	GLAAC is finalizing tent rentals and will have less than prior years. Soon the donation gathering attempts will begin. This year they would like to have all clubs represented under the tent. Doesn't have to be anything major, just something. Taking place Friday and Saturday, September 25th and 26th. Encouraged more Lowbrows to get involved and that they are looking for continuity on the board.
Treasurer Doug Scobel	Charlie read Doug's report that was emailed to the officers. "As I will be unable to attend Friday's meeting, here is my report: • I have classified Debbie Smith as a lifetime member in our membership database. • I wrote the $800.00 check to Debbie Smith for John's 60mm Coronado scope. I handed the check to Brian Ottum for presentation to Debbie this Saturday. • We have 150 memberships. • We have $7162.37 in the treasury. Doug"

Observatory Director Jack Brisbin	Observatory visit today showed everything ok. However, would only be reachable by 4 wheel drive vehicles as approach is packed snow and ice.
Member Brian Ottum	Detailed reminder of Estate Sale for beloved Lowbrow, John Causland's astronomy equipment. Items will be offered to Lowbrows prior to other clubs and general public. Event is tomorrow and the following day. Pictures of items featured in the Feb 15th email were made available and questions were answered.
Member Norb Vance	Brought in, for our inspection, his recent acquisition: a Celestron 3-axis smartphone telescope adapter.

Adjourned
9:24pm

Minutes taken and transcribed by
Joy Poling

2019 Year in Review Continued

This summer we ran another full schedule of Camp Burt Shurley events. This camp is for students of Detroit Public schools and is located just a few miles west of Peach Mountain. Starting in June and running until early August we attempt to do a star party for them on every Monday night. If the weather does not allow it then we try the next night and the next night, and finally give up for that week after Thursday.

In addition to our sessions at Peach Mountain and many observing events at various locations; we still held ACNO (Any Clear Night Observers) events at the home of John Causland. He has a pretty dark sky despite being between Ann Arbor and Dexter. Plus, having a paved surface to set up on and the ability to retreat into the house for warmth make this a most convenient venue. Sometimes an ACNO event will happen at other locations, but it is usually at John's and we are grateful for his generosity. As I approach the end of this report I must bring up great sadness, for the second year in a row. There will be no more ACNO events at John's house. In a sudden and shocking blow to our club, John passed away in August. He collapsed after running and was rushed to the hospital where he exited this existence. John was not only a key club member but also one of my dearest and closest friends. Even as I type this, months later, I find it hard to believe this happened. He has and will continue to be missed by us. I respect all views on such matters, but personally…I believe John has a much better view of the universe now than he did from this planet. Observe on John…observe on.

In conclusion, 2019 was a very active year for our club. It would have been even more intense had the weather not forced the cancellation of many events. You noted the number of libraries that requested us. Due to the typical small turnout for those events and the all too often hard time they give us trying to organize and schedule them…I wonder if we should start backing off from those. They also tend to want to do events during the week and/or during the day, which makes it harder to find people to commit. But somehow, it seems that our club almost always answers the call. Good work Lowbrows!

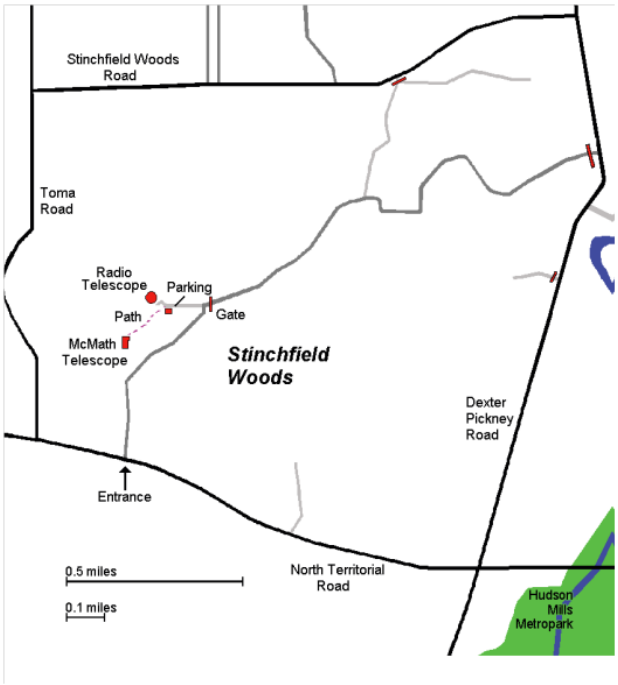
Upcoming Events

DATE	EVENT	LOCATION	
Friday March 20th. 7:30 pm	Monthly Meeting	Room G115 Angell Hall 435 South State Street Ann Arbor, MI.	Dr. Sean Gavin, Professor and Associate Chair, WSU Physics/Astronomy Dept, Topic: Lord Kelvin and the sun
Saturday March 21st.	Messier Marathon	Lake Hudson Recreation Area	Join other Lowbrows to view all 110 Messier Catalog Objects
Saturday March 28th.	Open House	Peach Mountain	Peach Mountain Observatory, 10280 North Territorial Rd Dexter. Michigan.

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

Annual dues are $30 for individuals and families, $20 per year for students and seniors (age 55+) and $5 if you live outside of the Lower Peninsula. Membership entitles you online access to our monthly Newsletters and use of the 24" McMath telescope (after some training). A mailed copy of the newsletter can be obtained with an additional $18 annual fee to cover printing and postage. Dues can be paid by PayPal (contact the treasurer to find out how) or by 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 $65.90/2 years
Astronomy -$34.00/year, $60.00/2 years of $83.00/3 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

President:	Charlie Nielsen	(734) 747-6585
Vice President:	Adrian Bradley	(313) 354 5346
	Jim Forrester	(734) 663-1638
	Joy Poling	
	Dave Jorgensen	
Treasurer:	Doug Scobel	(734) 277-7908
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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