

REFLECTIONS / REFRACTIONS

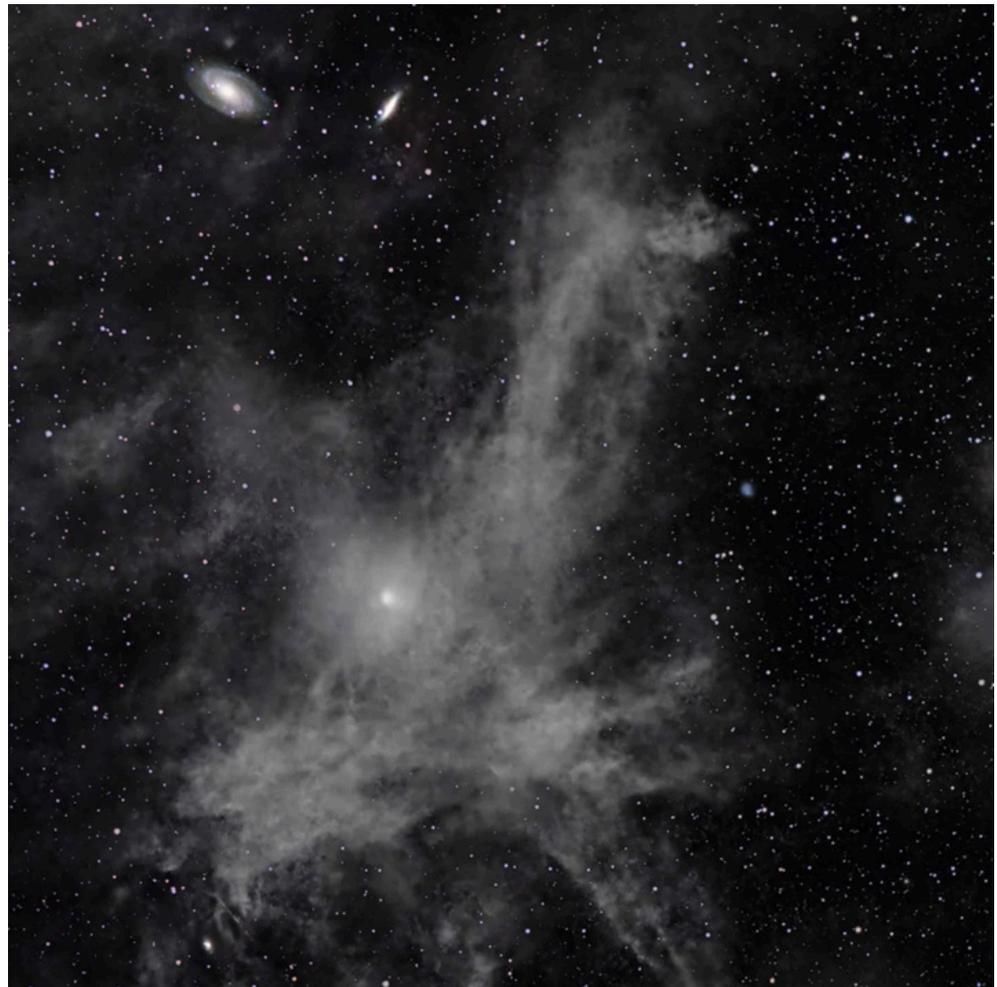
REFLECTIONS \ REFRACTIONS

University Lowbrow Astronomers Monthly Newsletter

February, 2026, Vol 50, Issue 1

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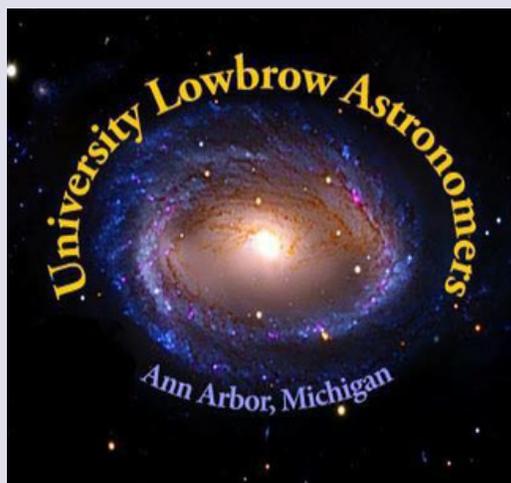


INTEGRATED FLUX NEBULA, M81/M82

BY BRIAN OTTUM

The space between stars is not empty. This is a picture of the dark clouds of dust and scattered gas molecules. They call it the "Integrated Flux Nebula," and it's located near Polaris, the north star. That pair of galaxies (M81/M82) is much, much further away.

Took this shot in the very dark Glennie, in northern Michigan. □



REALIZING A 40-YEAR DREAM

BY TIM MILLER

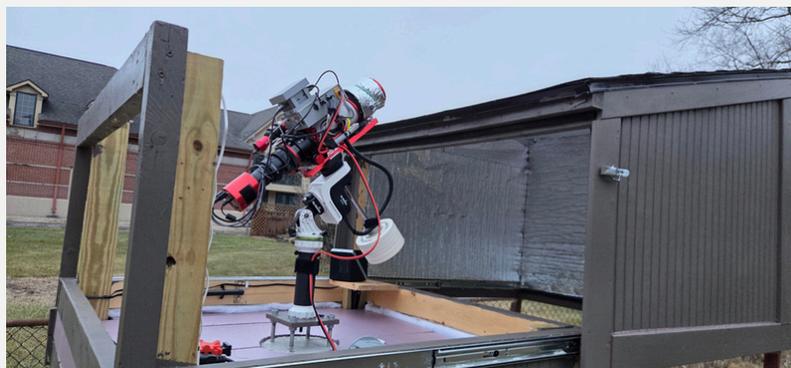
Like many of us, my love of the night sky began when I was a child, with my first telescope at age eight. Since then, I've always had some kind of telescope, and my fascination with the cosmos has only deepened. The idea of building a backyard observatory had been a dream for most of my life. Thirty years ago, that vision was a dome, a big optical scope, all the cool gadgets, and living under a dark sky—just like the glossy spreads in *Astronomy* and *Sky & Telescope* magazines made it look. Reality didn't fit that vision at all. Being a starving musician and then a public-school teacher for most of my life, time and money were always the barriers to making this dream real. When I retired three years ago, I decided to rekindle my involvement in astronomy, particularly astrophotography, and quickly discovered a whole new world of possibilities that I'd missed by not keeping up with the evolution of digital imaging.

I owe a debt to my brother-in-law, a semi-pro photographer, who became the catalyst when he loaned me an older Pentax K-3 II camera body. With some inexpensive prime-focus manual lenses from the 1990s—picked up on eBay for about \$40 each—I got started. This camera has a feature called Astro-Tracker, an extension of its anti-shake system. The sensor itself can move, driven by motors tied to an IMU (gyroscope, accelerometer, and compass) and GPS. The camera knows where it is, where it's pointing, and how it's oriented, allowing it to track the sky without a mount. With a 28–50mm lens, I could take 30–60 second exposures and track the sky for four to five minutes at a time before re-centering. Stacking software easily handled the small misalignments, and this approach served me well in the beginning.

Of course, I wasn't immune to the inevitable quest for more focal length. After purchasing a really good 200mm prime lens, it became clear that I needed a tracking mount. I bought a Sky-Watcher AZ-GTi, which, in hindsight, wasn't the ideal choice, but once I discovered it could run in equatorial mode, it proved itself. The AZ-GTi uses the same motors and drive mechanisms as its equatorial sibling, the Star Adventurer, and it has worked well enough for my purposes and budget. I still use this mount today and designed my imaging rig around its weight limits.



As my skills evolved—and that persistent desire for more detail crept in—I decided to build an imaging setup around a small refractor astrograph. The goal was to prioritize spending on the most important components first, fill in the rest as budget allowed, and keep everything under 9.5 pounds.



I settled on a ZWO FF65 astrograph, a 65mm f/6.4 quintuplet flat-field refractor (ZWO's rebranded Askar PHQ65—same scope, different colors). I paired it with a small 30mm guide scope, the least expensive guide camera I could find (a ZWO ASI120 Mini), and a micro PC running NINA. At this point I could guide, plate-solve, and run semi-automated sessions, still using the Pentax as my imaging camera.

joined the Lowbrows in June of 2025, and after many great conversations, a few things became clear. I could get quality images from Belleville's Bortle 6–7 skies by using filters. To take advantage of limited clear nights and short two-hour windows, the scope needed to be permanently set up. Winter setup is unpleasant at

REALIZING A 40-YEAR DREAM continues, page 3

best. And after a great conversation with fellow Lowbrow Norbert Vance at Astronomy at the Beach, I began doing photometry in addition to astrophotography. The spark for a backyard observatory was fully rekindled, and the idea crystallized into a micro-observatory: a small, doghouse-sized structure with a roll-off roof and remote connectivity to my office.

The Design

The design was driven almost entirely by my backyard's horizon limitations. To the south are power lines that I treat as a horizon barrier at about 40 degrees altitude, though the sky clears nicely once objects pass the meridian. To the east, I have two notches of sky about 30 degrees wide, clear down to roughly 30 degrees altitude—below that, metro Detroit dominates anyway. The eastern obstruction will remain until my wife agrees to take the tree down, or Mother Nature does it for me. To the north, I can easily see Polaris and access much of the circumpolar sky, while the west is wide open. Given all of this, the primary constraint was that the scope needed to be at least six feet off the ground to maximize usable sky, and that single requirement drove most of the design.

The structure is elevated on legs, with the pier four feet above ground level and an extension bringing the scope to about six feet high. I didn't want to need a step ladder, so I changed the roll-off concept from just the roof to three sides that move north together with the roof. The south wall opens downward, allowing full access to the scope from all four sides while standing on the ground. I found 300-lb-rated drawer slides with 40 inches of travel, and by carefully managing weight, the entire roll-off section—including the shingled roof—came in at about 150 pounds. The roof rolls north, slopes south, and leaves the northern sky unobstructed. Power is currently supplied via a 120-volt extension cord, with electronics running off a 12-amp 120V-to-12V converter. The whole thing sits on legs that are anchored to (4) 100lb concrete blocks and survived the 70mph storms we had in the fall.

What I Would Have Done Differently

Overall, I'm very pleased with the observatory—it's meeting all of the goals I had for it. Design is tricky, especially when rebuilding a full "version 2" isn't really an option. After five months of operation, a few lessons stand out. The first was the roof. I chose lightweight asphalt shingles because they were simple and inexpensive, but in hindsight, I wish I had spent the extra money on a white steel roof. The enclosure heats up quickly in the sun, and it became clear that active ventilation and insulation were necessary.



To address this, I built a microcontroller-based system that runs a vent fan in summer and a small heater in winter, combined with radiant insulation. Two sensors monitor inside and outside temperature and dew point, with adjustable thresholds to keep the enclosure cool and dry in summer and above freezing in winter. I added gun-cabinet heaters to keep the enclosure just a few degrees above ambient and reduce condensation risk, and a small 500-watt space heater handles extreme cold. Radiant foil insulation (about R-5) dramatically reduced summer heat gain, while foam insulation in the roof and floor helped retain heat in winter. Interestingly, the shingles actually help in colder months: even with daytime temperatures in the teens, the enclosure can reach about 35°F in the sun, and the heater only needs to run about 12 minutes per hour during the night, even when outdoor temperatures drop below zero.

The second design issue was the enclosure size relative to the 40-inch roof travel. I built the box as a 40-inch square to allow for a future larger scope, but didn't anticipate the roof overhanging about four inches into the box when fully open. In summer, dew drips off the roof into the enclosure. It doesn't hit the scope, but it does create a wet mess that needs to be cleaned up before closing. If the box had been 36 inches square, the water from the roof would land outside instead. To manage this, the control system includes a dehumidification mode that heats the enclosure to about 75–80°F for 30 minutes, then exchanges the air with the vent fan.

The radiant insulation also created an unexpected Wi-Fi problem. A foil-lined box turns out to be an excellent signal blocker. Once insulated, the roof—rolling north, directly between the observatory and my office—became a barrier, and I had to install an outdoor access point on my shed to restore reliable connectivity.

In the end, I'm very happy with the outcome. I've been able to use the scope throughout some brutally cold weather. Even when temperatures are in the single digits, I can open the roof, power everything up, and retreat back inside. This project has allowed me to go deeper and enjoy the hobby in ways I couldn't before. □

SEESTAR vs SIRIL

BY JEFF KOPMANIS

The winter months might be dreary times for many astronomers, as the cold and clouds make viewing and imaging a rare occurrence. However, it's a great time to take a 2nd crack at some of your summer treasures with the latest versions of Siril, the VeraLux, and CosmicClarity tools.

I chose 3 objects that I thought the native Seestar app and its "AI Denoising" tool did a nice job, but nonetheless didn't "pop", so I thought I'd give the Siril/VeraLux tools a run to see if I could improve things.

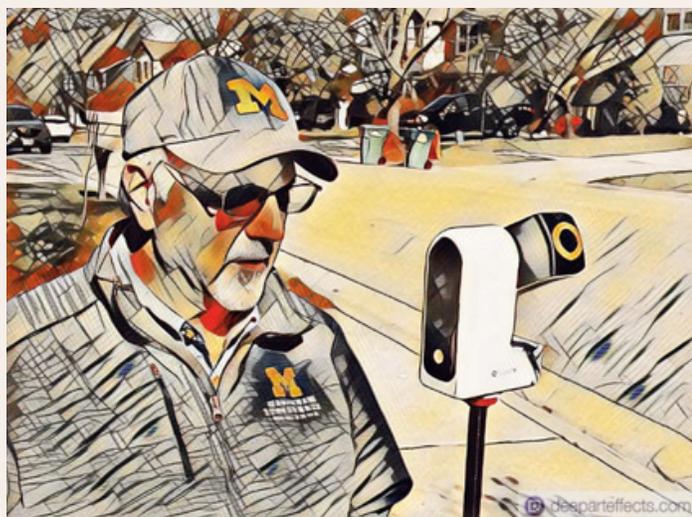
In the Seestar app, I ran the AI Denoise tool, then used the Edit tools to vary Brightness, Contrast, and Saturation. In Siril, my workflow amounted to filtering out the green noise, separating the stars, then stretching and manipulating the nebulosity before recombining the stars, and even then, going easy on the stars so they didn't dominate the photo and retained their truer colors. Most images were processed in about 3 minutes in the Seestar app, and in Siril, roughly 20 minutes or less.

The Horsehead and Flame Nebulae

This was an interesting case because I was very pleased with the result that the Seestar app produced. With only 70 minutes of exposure, it produced a nicely balanced photo showing plenty of detail, stars that looked very reasonable, and a smoothness that looked very professional. I was intrigued to run it through Siril to see what I could come up with. I was able to brighten the surrounding nebulosity and reveal details that were "smoothed over" in the Seestar photo. Star colors were superior in the Siril photo, although bright "blowouts" still existed. A side-effect that I couldn't eradicate was a certain "grainy-ness" in the Siril photo, in spite of a number of back-tracks and redos. Does more detail pay a price in smoothness?

Sh2-101

I don't have a full-frame version of the Seestar photo, but for this comparison, the cropped version illustrates the features just fine. The full-frame only further illustrated the inundation of stars that were present, which obscured the target: the nebula behind those hundreds of foreground stars. In Siril, I used the StarNet Star Removal feature to separate the stars into a star mask file,



[SEESTAR VS SIRIL continues, p. 5]



leaving the nebulosity in a separate file that I could stretch (VeraLux HyperMetric Stretch) and manipulate to bring out those features in the background image file. To re-combine the star mask and the background is performed with the VeraLux StarComposer tool, which allows you to control the intensity, “softness” or “focus”, and even how colorful. The net effect is that you get a star field that is more proportional and friendly to the eye. When combined with the increased detail, you get in the background image, gives you a superior image from Siril. The nebulosity and color left me in awe!



The Rosette Nebula (NGC 2238)

The Rosette Nebula was a last-minute pick, but it really illustrates the differences between the AI Denoise and tools in the Seestar app, and the VeraLux and CosmicClarity tools in Siril. The same process was performed as in Sh2-101, but the differences really popped out: enhanced nebulosity, controlled and colorful stars, and, in the Rosette’s case, there was a smoothness that rivaled the Seestar.

Summary

All of the Siril images had better detail, colors and star colors, but the Seestar Denoise seems to do a great job of smoothing in most cases. For the time involved, the Seestar is an amazing tool to get you something to share very quickly, but for the cost of another 20-30 minutes in Siril, you can really bring out everything that your telescope captured, Seestar or otherwise.

Tools Used

Here’s a quick summary of what the various tools do. I intend to write a future feature on some of these tools in a future article.

Seestar AI Denoise - After capturing, you can go into your Gallery and use the little “magic wand” tool to run the AI Denoise tool, which will eliminate the background “clutter” and enhance the target object, since the Seestar knows what you’re going after.

Seestar Edit - With the Edit tools, you can use sliders to vary Brightness, Contrast, Saturation and cropping with any image in your Seestar Gallery (not available in the Phone Gallery)

Siril: VeraLux HyperMetric Stretch - Found in Scripts > Python Scripts > VeraLux, this is the main stretch tool in the VeraLux suite. In it’s “Ready-to-use” mode, there are only 3 sliders and a Preview that make your image stretching a breeze. There is a “Scientific” mode to add some finer control, but both are very simple. The PROCESS button makes it all permanent. VeraLux tools are simple to install via the Siril Get Scripts facility.

Siril: VeraLux StarComposer - In the VeraLux menus as above, this is a simple miracle tool to re-combine your star and background images. Siril has its own tools, but the VeraLux tool is much easier to get great results with.

Siril: VeraLux Silentium - This is VeraLux’s noise eliminator. It doesn’t offer a preview as the tools above do, but it still is a very effective tool and seems to do a little better than the Siril-native tools.

Siril: VeraLux Vectra - This tool allows you to change the saturation and hue for the standard red, green and blue, as well as yellow, cyan and magenta colors. There’s a clever vector display to summarize your actions.

Siril: CosmicClarity - The tools are found in Scripts > Python Scripts > Processing, and are usefully named. Each will call up it’s installed binaries as well as connecting to an external AI service. I use mostly the Denoise and Sharpen tools. Download the binaries from <https://www.setiastro.com/cosmic-clarity> and install the Python scripts from within Siril’s Get Scripts menu. □

OUTREACH REPORT: CHELSEA PTO SCIENCE NIGHT

BY CHARLIE NIELSEN
PHOTOS BY JIM FORRESTER

The Chelsea PTO science night was very successful. They had numerous demos, exhibits, and activities going on throughout the Chelsea Senior Center. Our club was set up in the cafeteria to demonstrate optics and various types of telescopes, including smart telescopes. We had examples of every common telescope type and focused them on astronomy images that we taped to the opposite wall. Jeff was running "simulated stargazing" on his Seestar S30. I told a couple of people that I wanted to see if they would believe the orange dust cover on the objective lens was really a filter of miracles, and it looked right through the roof and ignored the lights around us. I used our laser optics kit to show attendees how lenses and mirrors make telescopes work and why we see things upside down.

Jack, Jim, John, and Adrian all brought one or more telescopes, and John also had his Dwarf 3 smart telescope. Ginia was helping people use her 3D goggles that use a cell phone and astronomy software to show what is in the sky as you move your head around. Adrian noticed that he could see the Moon as he was entering the building, so he deployed a small telescope to show the Moon and Jupiter, and he gutted it out in the cold for the entire two-hour event, plus.

Thanks to Charlie Nielsen, Jeff Kopmanis, John Ridley, Jack Brisbin, Adrian Bradley, and Jim and Ginia Forrester. We estimate at least 100 visitors. It seemed like everyone was having a great time, including us. □





**YOU'RE INVITED TO ...
ASTRONOMER DEAN REGAS'
ONLINE CLASSES**

When: Feb 11, 2026 07:00 PM Eastern Time

Topic: The Life and Times of Galileo

Explore Renaissance Astronomy at its finest. Copernicus, Brahe, Kepler, and Galileo all made huge leaps in our understanding of the universe. What did they discover and how did they change everything?

Link:

**[https://us06web.zoom.us/j/84896339882?
pwd=Opb4ZO3dNwws8W0r10VQFfoEhCyp](https://us06web.zoom.us/j/84896339882?pwd=Opb4ZO3dNwws8W0r10VQFfoEhCyp)**

Tb.1

Passcode:049282

**Dean Regas, Your Astronomer
Host of the Looking Up podcast
<https://www.astrodean.com>**

**2026 OPEN HOUSE AND
OTHER EVENTS
SCHEDULE**

January 30: Chelsea PTO

March 9: Glencairn Elementary

**March 14 and/or 21: Messier Marathon
(Peach Mt. or Lake Hudson)**

April 11: Peach Mountain

**April 18: Peach Mountain (Rain Date
for above)**

May 9: Peach Mountain

**May 16: Peach Mountain (Rain Date for
above)**

June 6: Peach Mountain

**June 13: Peach Mountain (Rain Date
for above)**

July 11: Peach Mountain

**July 18: Peach Mountain (Rain Date for
above)**

August 8: Peach Mountain

August 15: (Rain Date for above)

**September 12: Peach Mountain (Rain
Date is AATB)**

**September 18 and 19: AATB (at Island
Lake State Recreation Area)**

October 3: Peach Mountain

October 10: (Rain Date for above)

November 7: Peach Mountain

November 14: (Rain Date for above)

WEBSITE UPDATE

BY TIM MILLER

The Lowbrows will have a new web presence beginning sometime around March 1st. Our current web host contract expires on March 15, and we have chosen not to renew it. Barry Chapman, a Lowbrow member, has graciously donated the services of his company, Ghosttown Development, along with server space for our new website.

In November, Barry and I accepted the position of Webmaster for the club. We've divided the responsibilities to match our skill sets, with Barry focusing on the behind-the-scenes functionality of the site and me focusing on content and presentation. As mentioned at the December meeting, my approach to the public-facing portion of the site emphasizes clarity, accessibility, and alignment with our mission of outreach and encouraging public involvement in observing and astronomy.

The overall "look" and "feel" of the new site centers on organizing information to align with current practices in website design, where content is easy to find and quick to access. Rather than pages with lists of links that require users to build their own mental map, I hope the site presents information in a way that helps visitors quickly find what they need and what interests them.

About 90% of the public content has already been migrated from the old website (Lowbrows.club, now effectively an intermediate site). I'm confident that when the current hosting contract expires, the new site will be live with Open House information, the Young Astronomer section, Peach Mountain content, and Events and Outreach pages available to the public.

Barry and I are also in the early stages of designing the member section of the site. Plans include spaces for members to post articles and events, personal image galleries tied into a club gallery, and a members-only forum for discussions that currently happen via email. Select content—such as images and important announcements/astronomy news—will be curated for display on the home page. We also hope to streamline the membership process and will be consulting with Doug Scobel, our treasurer, to explore ways to make that easier. Our priority is launching the public-facing site in March, with member features added as they are developed.

Finally, we are exploring ways to organize and archive decades of club material. Newsletters and documents on the older UM site date back as far as the middle 90's. The goal is not to remove this content, but to index and archive it so it remains accessible without overwhelming users with long yearly lists. Members have shared how meaningful this historical content is, and preserving that connection is important. By launch time, I also plan to have a way for members to provide feedback, corrections, and suggestions. In the meantime, feel free to contact me directly with any input.

~ Tim Miller (robotiger14670@gmail.com) □

UPCOMING SPEAKER SCHEDULE

**February 20: Dr. John
Monnier**

**Topic: about new
CubeSat project**

**March 20: Jim
Shedlowski**

**Topic: The Way We
Found the Universe**

April 17: TBD

May 15: TBD

June 19: TBD

July 17: TBD

Lowbrow Meeting Minutes
January 16, 2026
Recorded by Don Fohey

The meeting began at 7:35 pm.

President Charlie Nielsen introduced Professor Fred C. Adams, a U of M Professor of Physics. His presentation was titled "The formation of Jupiter and other Giant Planets." He explained how solar systems are formed by summarizing much of the information from the discovery of over 6000 exoplanets. His presentation was well received, and our meeting was attended by many non-members who attend because Professor Adams was speaking.

Business Meeting began at 9:15 pm.

Charlie Nielsen reported: Seven members were going to attend the Chelsea PTO Science Night Event Friday, January 30th. Three members responded that they would attend the Glencairn Science Night which has been rescheduled for March 9th.

Tim Miller reported: He is working on the website and is pulling content from the old site. He is working on public area content first. He was asking members present if they agreed with this vision, and is asking members for content suggestions.

Jack Brisbin reported: He has visited the observatory, and everything is in good order. He started a discussion of the proposed open house schedule. Members agreed to cancel the September 5th date. There was a discussion of conducting one open house per month. Kathy Hillig suggested that the second date of each month be a "rain date" for the first date of the month. Members agree with the plan. Charlie will send to the members a new schedule. Astronomy at the Beach this year is Sept 18th and 19th.

Ken Cook reported: His wife Christina has sent the February events to the Observer Newspaper.

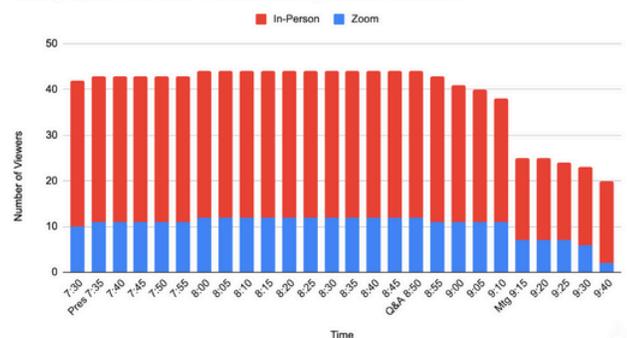
Jeff Kopmanis reported: The current WordPress web hosting service will not be renewed and the web site will be migrated to a hosting service provided by Barry Chapman. He had RASC calendars and RASC handbooks ordered by members at the meeting for pickup. There were 12 people logged into the meeting via ZOOM and 32 in attendance.

Treasurer Doug Scobel reported via email: We have 213 memberships. I made our usual monthly payment to AT&T for our Open House "hotline". There were no other club expenses paid out. As of this writing we have 6 and 4 RASC wall calendars and observer's handbooks, respectively, available to order. (Contact me or Jeff Kopmanis if you are interested in purchasing any. As always, the records I keep are open for any and all Lowbrow members to examine.)

The meeting ended at 9:45pm

Meeting Attendance

January 16, 2026 - Fred Adams - The Formation of Jupiter & Other Giant Planets

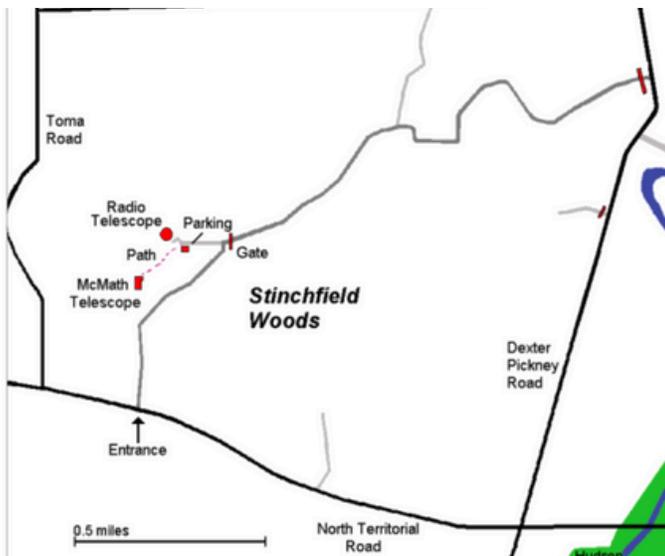


Max	12	32
Percent	27.27%	72.73%
Total	44	

PLACES & TIMES

Monthly meetings of the University Lowbrow Astronomers are held on the third Friday of each month at 7:30 p.m. The location is usually the Judy & Stanley Frankel Detroit Observatory. The Observatory is located at 1398 E. Ann St., Ann Arbor. The Ann Street Parking Structure (M86), the Catherine Street Structure (M5), the Glen Street Structure (M61), and the School of Public Health II Lot are usually open after 6:00 p.m. Mon-Fri. The M86 structure is closest to the Detroit Observatory.

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 radiotelescope, 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 canceled if the forecast is for clouds or temperatures below 10 degrees F. For the most up-to-date info on the Open House / Star Party status call: (734) 975-3248 after 4 pm. 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. Evenings can be cold so dress accordingly.

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

MEMBERSHIP

Annual dues are \$30 for individuals and families, or \$20 for full time students and seniors age 55+. If you live outside of Michigan's Lower Peninsula then dues are just \$5.00. Membership lets you access our monthly newsletter online and use the 24" McMath telescope (after some training). Dues can be paid by PayPal or by mailing a check. For details about joining the Lowbrows, 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: Amy Cantu cantu.amy@gmail.com to discuss format. Announcements, article, 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:	Don Fohey Brian Ottum Ken Cook Tim Miller
Treasurer:	Doug Scobel
Observatory Director:	Jack Brisbin
Newsletter Editor:	Amy Cantu
Key-holders:	Jim Forrester Jack Brisbin Charlie Nielsen
Webmaster:	Barry Chapman
Online Coordinator:	Jeff Kopmanis

A NOTE ON KEYS: The Club currently has three keys to the Observatory and the North Territorial Road gate to Peach Mountain. University policy limits possession of keys to those whom 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