



REFLECTIONS / REFRACTIONS

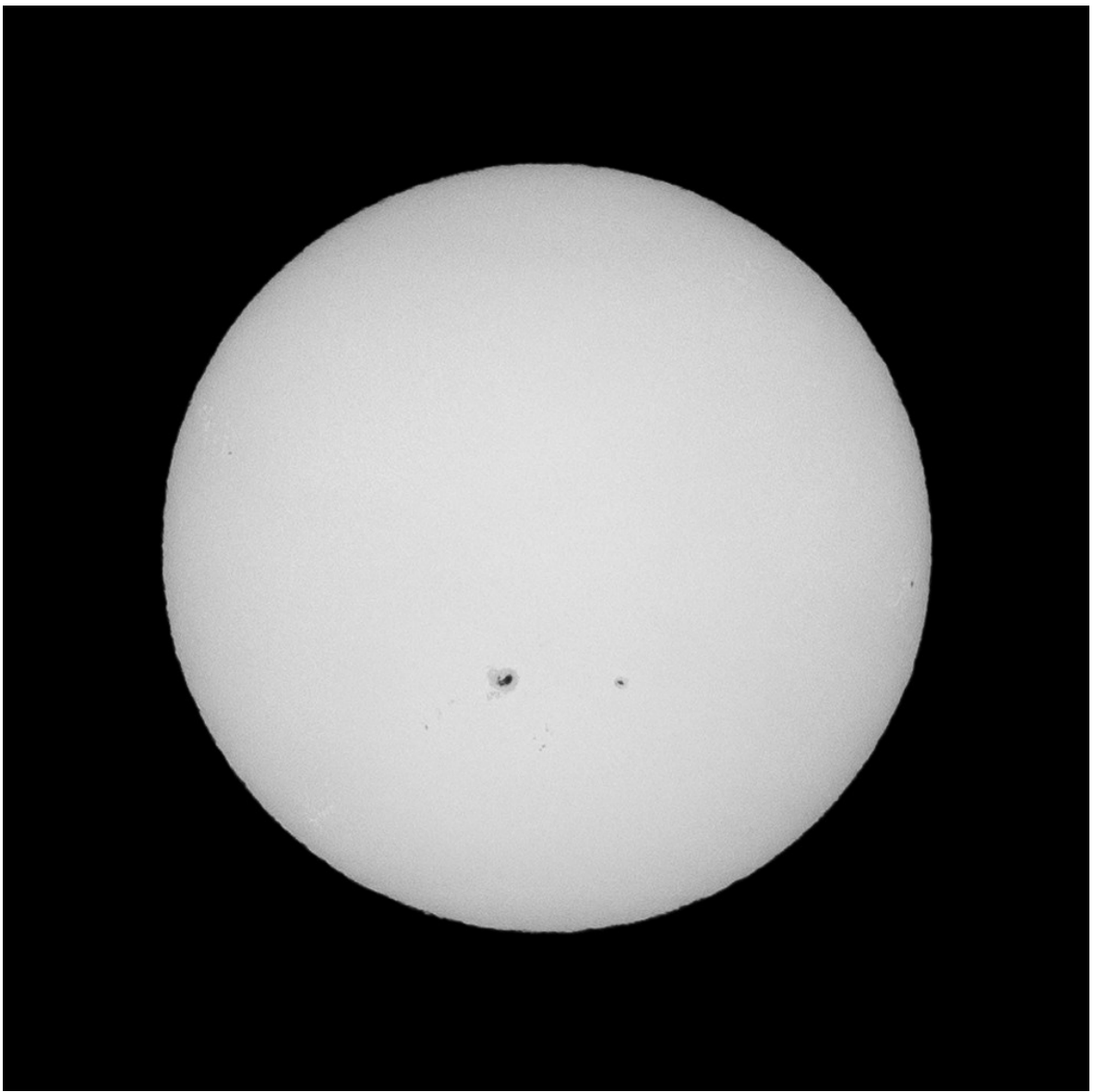
University Lowbrow
Astronomers

REFLECTIONS \ REFRACTIONS

Decembr 2020

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Yea Sunspot! Active Region AR2786



Douglas Scobel wrote in an email to members on Saturday Nov. 28th. "From my front lawn just a few minutes ago. Get out there and look!"



Awni Hafedh wrote to members a few minutes later. “This is my attempt, thanks for telling me the name of the sunspot. “

Field Trip to the Peach Mt. Radio Observatory



Photos by Jeff Kopmanis, control room on right

Telescope Lending Program at the Ann Arbor District Library: An Update

By Amy Cantu

As many of you know, the University Lowbrows partner with the Ann Arbor District Library (AADL) to sponsor a telescope lending program. This program, which began in 2012, spurred the creation of a now-vast collection of non-traditional circulating items the Library calls “Tools” -- e.g.. Music Tools, Art Tools, Science Tools -- that includes synthesizers, sewing machines, thermal cameras, science kits, and much more. The telescope was the first such “tool” and throughout the years has remained one of the Library’s most popular non-traditional circulating items.

The Model and Its Modifications

The AADL scope is an Orion Starblast 4.5” table-top telescope that’s been modified from its out-of-the-box setup to include a fixed 8-24 mm zoom eyepiece. We’ve replaced the collimation knobs with locking-nuts (so patrons can’t mess unnecessarily with the primary mirror), and made a few other minor adjustments to make the novice experience a little less cumbersome and parts a little less easy to lose.

Modifications are based on the New Hampshire Astronomical Society’s Library telescope-lending program (more info on that here: <http://nhastro.com/ltp.php>). AADL’s modifications have been spear-headed by our Lowbrow Clay Kessler with a team of volunteer Lowbrows. Clay also led a second workgroup a year or so after launching the collection to add more scopes and to swap out the original finder scope with a more durable model (<https://optcorp.com/products/os-rdmf-red-dot-multi-reticle-finder>) as the New Hampshire model’s original finder wasn’t holding up.

Here’s a link to the Library’s catalog record for the telescope: <https://aadl.org/catalog/record/10259778>. The record includes a 16-page manual and a link to viewing tips. Each scope comes in a padded euphonium bag and includes a Lens Pen for cleaning optical surfaces; two red flashlights; and *Constellations*, a National Audubon Society Pocket Guide.

Circulation and Holds

The seven telescopes began circulating in 2012 but by the following year - due to overwhelming demand - AADL bumped up the number of scopes to 30. At launch, the collection generated a request list of about 300 patrons and it took a year and a half to clear out that list. During a normal (non-pandemic) year, there’s usually a hold list of a couple dozen requests beginning in the warmer months and the list clears up at the beginning of winter before picking up again in spring.

Patrons can request a pickup at any of the Library’s four branch locations or at the main Downtown library. In addition to the regular collection of telescopes used to fill patron requests, a few telescopes belong exclusively to the Library’s “Express Shelf” browsing collection at the Downtown branch - so there’s always a scope or two sitting around to inspire that serendipitous encounter between a casual browser and a lonely telescope on a clear night. As of this writing, in late-October 2020, the AADL system is still closed to the general public due to the COVID-19 pandemic, so the browsing collection is unavailable.

In late October 2020, AADL decided to start circulating telescopes again. There are currently 14 telescopes going out to fill over 100 patron requests, with six still in reserve for the Express Shelf browsing collection. When AADL resumes normal post-pandemic business hours, the Express Shelf browsing collection will once again be available and there are additional plans to initiate an eventual Reservation-based collection so patrons can schedule a telescope pickup for a particular day and time.

Most of the scopes have now circulated between 100-150 times each on a two-week loan and they’re holding up okay. The padded euphonium bags cushion them from the inevitable bumps and bruises during transport. By and large, the most damage we see is to the eyepiece, but we’ve had a couple broken primary mirrors; a couple broken secondary mirrors (that we were able to swap with those on retired scopes); several dented tubes; some loose finder-scopes; and a humorous situation where a patron attempted to hide a broken base by substituting a home-built wooden replacement and painting it to match.

From day one, patron feedback has been consistently and overwhelmingly positive. At an AADL board meeting early this year, two patrons thanked the board for lending telescopes and library staff members frequently hear expressions of delight from new patrons who are surprised to discover we circulate telescopes

Replacement and Maintenance

The replacement cost for a library telescope kit is roughly \$570, but about \$200 of that amount is for the euphonium bag alone. However, while AADL will bill a patron for missing parts, the library generally won't bill for damage, even if that damage is catastrophic. We know the scopes are intended to be used outside in the dark by children and families, and therefore the library considers a dropped or broken scope "normal wear and tear" for this collection. The Library's view is: Why punish our patrons because we choose to lend telescopes? The collection is, after all, their tax dollars at work!

After launching the collection, it became clear that a trained group of AADL staff members was needed to inspect each returning scope for broken parts and missing items, and to check and replace the finderscope's battery when necessary. Indeed, as the Library acquired more and more non-traditional circulating items, a trained group of "check-in" staff became imperative. Over the years, AADL has purchased two replacement telescopes and retired several damaged scopes, some of which are still proving useful as sources of spare parts. Back in March when the COVID-19 pandemic initially spread and the library system shut down, we let patrons keep telescopes they'd checked out well beyond their due date with no fees accumulating as returning them was not an option with the Library system closed. After starting our current contactless vestibule service this summer, patrons have been invited to return the telescopes to the vestibule where a staff member on a computer monitor will alert staff in the back of the library to come out and retrieve them.



Clay Kessler working on telescope

Lowbrow Help

I'm currently a librarian at the Library's archive and although I don't work directly with the collection, I help when I can and serve as liaison with the Lowbrows. I was able to make a general inspection of the collection early in October and fix the finder alignment on most of the scopes - a maintenance procedure that hadn't been done in a while and should be done more frequently. I found that the alignment was often well off the mark and that some hex head adjustment screws were stripped. I did my best to replace and realign those that I could and most are now pretty close. During that inspection, I discovered another broken eyepiece and finderscope that will need to be replaced.

The overall condition of the scopes does suggest that a closer inspection by skilled astronomers may soon be useful. That's where you come in! Trained Library staff can only do so much, and when it comes to issues of fine-tuning - removing the primary mirror for cleaning; collimation; and general troubleshooting - skilled assistance is necessary. In addition, we may end up purchasing a few more scopes that will need to undergo the usual modifications.

The COVID-19 pandemic precludes us from gathering for any group maintenance sessions at this time, but once life has returned to some semblance of normality, I'll want to put out a call for another Lowbrow work group and try to lure you in with coffee, juice, and pastries. If you'd be willing to participate in such a group, please let me know and I'll put your name on a list for that eventual day. The Library provides all materials.

Plus, did I mention coffee, juice, and pastries?

Chasing the Milky Way – A Worthy Obsession

by Lowbrow VP, Adrian Bradley



'Milky Way Chasing' ... something I've loved doing since trying to merge my love of astronomy with photography. And, my images that I produce have evolved over the short time that I've been engaged with this hobby.

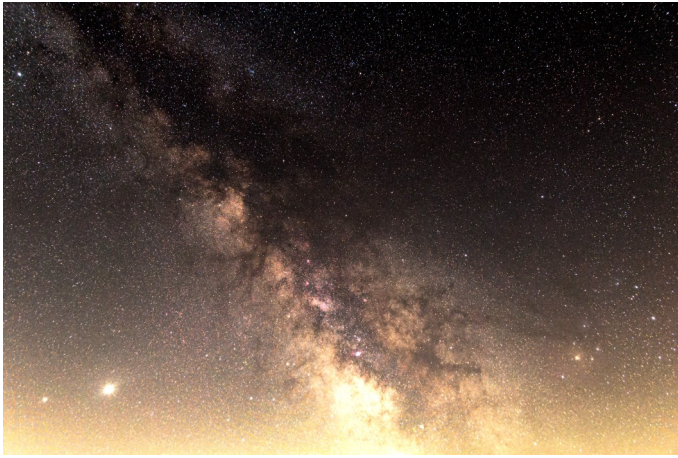
While I do plan to share some tips and tricks I've learned along the way, I'm mostly here to just share some of my experiences that went along with my images, and how I hope to continue improving as time goes on.

Where To Find The Milky Way

The Milky Way, that bright arm band chock full of stars in the night sky, is visible throughout the year. But there is a caveat – you have to be in skies that are dark enough to see it. At a minimum, the sky has to be in a rural setting, away from urban lights. How bright the Milky Way appears depends on how dark the skies are. When they are dark enough, the Milky Way easily stands out looking like a narrow cloud streaming through the sky – from which it gets it's antiquated name. It looks just like a river of milk.

You may not see it from your home if you are too close to a large urban area with lots of light pollution. So to visualize where it is, you can use a star gazing app such as Sky Safari Pro or Stellarium, and it will show you where the Milky Way runs. In the Northern Hemisphere, the Milky Way runs between Saggitarius and Scorpius, up through the Summer Triangle, splitting Cygnus in half, then through Lacerta, Cassiopeia, Perseus, Auriga, to the left of Orion, through the feet of Gemini, the head of Monoceros, the top of Canis Major, and through the part of Puppis that is visible at our latitude (between 41 and 42deg North Latitude).

In summer, you can see the part that runs through Saggitarius and Scorpius. It is the core of the Milky Way and the object of many a Milky Way Chaser who produces his/her pictures featuring it. In winter, this part of the milky way disappears from our view. As the brightest parts of the Milky Way sink to the west, it's dimmer parts rise from the Northwest to the Southeast.



The Summer Milky Way from 2020. Note, we're seeing the Galactic Center and the Northern side of the Bulge. In lower Northern latitudes parts of the Southern bulge are visible, and in the Southern Hemisphere they see the entire other side of the Milky Way which includes the Magellanic Clouds, the CoalSack Nebula, and Crux which is near the Southern Pole



This is a faint attempt at imaging the Milky Way as it goes through the Winter Circle. You may recognize the stars of Orion in the middle right. Using basic imaging techniques without a star tracker do not yield good results with this section of the Milky Way

How I Got My Photos, Then and Now.

It's been said that Canon's best camera for imaging night sky shots was the Canon 6D. I've been using one for my shots and noticing the differences between it and other camera bodies I have. Specifically, it's handling of noise in shot is very good compared to other camera models.

However it's my belief that the camera body itself isn't the whole key to getting good Milky Way Photos. The amount of time spent collecting light data from the Milky Way is key. Most of you who do Milky Way shooting may already know the following points that lead to good Milky Way shots:

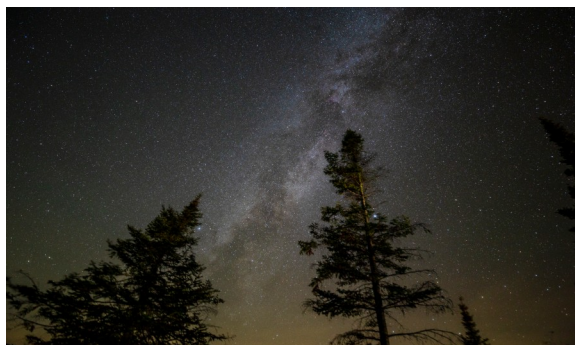
- The darker the skies, the less time is needed to gather good Milky Way light.
- The faster the lens used, the more light you will gather.
- If using a tracker at $\frac{1}{2}$ sidereal speed, you get a steady sky shot and reasonably steady foreground objects. 30 seconds tends to be a max time for this, although I've shot 60 seconds with a wide angle lens.
- Speaking of wide angle lens, the wider the angle, the more time you can expose for and get round stars.

I have shared my milky way shots with a number of different audiences. In doing so I've noticed some differences between the astrophotography community and the terrestrial photography community:

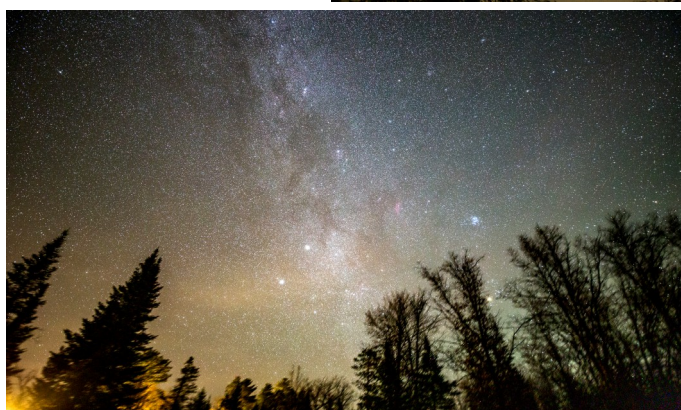
- Astrophotographers favor more detail in the Milky Way itself. Terrestrial photographers seem to enjoy a beautiful foreground more.
- Terrestrial Photographers know and use the 'rule of 500', and prefer to shoot in really dark sites where they can image the Milky Way clearly without having to track it. Some will even acquire stacking programs that can align and stack several images together, then place a solid foreground for the final shot. I've had terrestrial photographers show me Milky Way shots they took and emphasized that they 'didn't need a tracker' to do it.
- Astrophotographers, on the other hand, have no issues at all with a tracker, in fact they embrace it with most photos. As a result they not only shoot detailed Milky Way shots, they can get closeups of DSOs with the right lenses and amount of integration time on that tracker.



In my opinion it is up to whomever does the photography. But I have found in my quests that having a tracker enables me to get some decent Milky Way shots in less conducive situations. When I am somewhere that's dark, I'm able to dig in with ISO being up and really grab some detail. Then I can combine a shot where I expose the foreground without tracking so that it's nice and steady, and combine it with my longer, tracked shot to create a final composite image.



The photo on the left was taken at Lake Hudson Dark Sky Preserve with the 500 rule and an old camera with a kit lens. The exposure time was 30 seconds. On the Right you have the same region of the Milky Way, shot at Alcona Park which is a little darker than Lake Hudson, with a star tracker. The exposure time was around 60 seconds at half-sidereal speed.



The image on the left was taken using a tracker for a minute and a half, really pulling out details from the winter side of the Milky Way going through Perseus and down past the Pleiades and Taurus. However you can see that the trees are blurry. To fix that, I use Photoshop to input a shot of the trees that I took without the tracker running, and replace the blurry trees with the sharper ones, thereby creating the final image.



On the left you see my very first attempt at a Milky Way shot with a Canon 30D and an 18-55 f/3.5 kit lens. It was taken by a countryside residence in Milan. I left the exposure on for 49 seconds and got **some** detail. I was surprised but knew the addiction had stuck. Fast forward to 2020, and the image on the right appears. I did it with a similar method to what I did on the left, but had a star tracker and set it to $\frac{1}{2}$ sidereal speed. I went for 30 seconds on the exposure, a single shot of the Milky Way at Brauer Nature Preserve. After processing the image in Photoshop to 'enhance DSO and reduce stars' I wound up with a far more compelling Milky Way shot.

The next few shots are ones where I was lucky enough to capture a meteor within the shot.



The \$100 Meteor Shot: The left is an out of camera version of the 'lucky Perseid' meteor shot I captured in July of 2019. The processed version made my job's 2020 Calendar and I was paid \$100 for winning a spot. Meteors cannot be predicted, so the best way to capture one is to select a compelling target and hope a meteor comes racing through your frame at the right time.

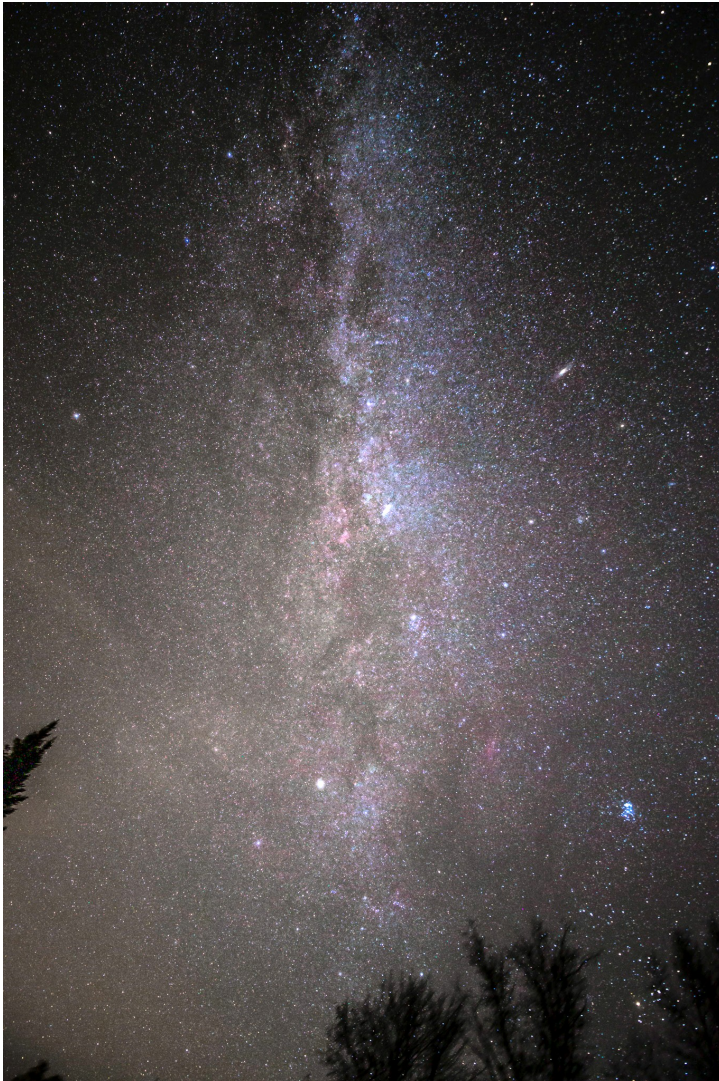
Full disclosure: Based on the trajectory of the meteor, I'm more inclined to believe it was an Aquarid, not a Perseid. But I had this image reposted on Instagram as a Perseid by an Astrophysicist when she saw it.



When at a Dark Sky Park, capturing meteors is a lot more likely. Here's one with the meteor flying over the galactic plane during this exposure at Lake Hudson's beach area.



Although there isn't much Milky Way to see here, this is still a special photograph for me. I call it 'John Causland's Meteor.' I took this on a night that was a year to the day he passed away. Astronomical twilight hadn't ended yet so the Milky Way Core is barely visible. I specifically hoped I would get a meteor to pass near the Milky Way on this night. I asked 'John, think you could send me a meteor?' I took a few shots facing the Milky Way and when I looked at this one, I noticed the bright streak in the middle of the photograph.



Conclusion – Where I Go From Here

Location is everything with a Milky Way photo. Shots over the lake, mountains, or a famous landmark draw lots of attention and are all over the internet. While I hope to go to these places and capture my own versions of these Milky Way shots, I plan on continuing to capture the Milky Way itself for it's own sake. It's become a bit of an obsession for me. This is why I suppose it's called 'Milky Way Chasing'... we are always after that next shot that is better than any one we have taken.

A good starting point for getting good Milky Way photos is to use a wide angle lens of 24mm or less, preferably one that can get down to f/2.8 or lower, and a modern camera body that handles high ISO noise really well. Set up your camera on the tripod, set focus to infinity on your lens and leave it manual (no autofocus), Then shoot for 20 seconds at f/2.8 or f/4.0 with the ISO at 3200 or 6400. At a dark sky park you can up the ISO to 6400 easily and get detail without much noise. If there are light domes I recommend going down to 3200 or 1600. Post process your image with anything that reduces noise and increases contrast. The darker the skies, the more detail you will have in your image.

The November meeting was recorded and can be viewed on you tube.

<https://youtu.be/6npgQWr3yuw>

Upcoming Events

Open House events have been canceled until further notice.

DATE	EVENT	LOCATION	
Friday Dec. 18th 7:30 pm	Monthly Meeting	By Video Conference. Instructions will be emailed to members,	Ryan Farber, Graduate Student, UM Astronomy Galactic Winds

University Lowbrow Astronomers

Monthly Club Meeting Minutes

20 November 2020, 7:34 pm, Individual Live Connections via conferencing tools

After some chatter to allow for late arrivals, President Charlie Nielsen called the meeting to order and then introduced our speaker.

Speaker

Who

Dr. Richard Teague

Subject

How To Find Baby Planets

A Q&A session occurred afterward with audience members using multiple formats to ask questions. Charlie thanked Dr. Teague for the presentation.

Business Meeting

Name	Topic
President Charlie Nielsen	We will not be planning a members only Peach Mountain outing due to COVID. Bernard Friberg, long time member and former observatory director, passed very recently. (https://obits.mlive.com/obituaries/annarbor/obituary.aspx?n=h-bemard-friberg&pid=197140293) We held a moment of silence for his passing
VP Adrian Bradley	GLAAC meeting will be Dec 3 rd . All who are interested in volunteering are welcome to attend online. Contact a current GLAAC member for more information (Adrian Bradley, John Walbank, Dr. Brian Ottum, Jeff Kopmanis)
Treasurer Doug Scobel	154 memberships, \$8686.76 in the treasury. Doug has completed his move to Traverse City.
VP Jim Forrester	Don Fohey, Newsletter Editor, is going in for surgery after a severe boating accident. It will take multiple months for him to recover.
Observatory Director Jack Brisbin	Met with Jeff Kopmanis and the U of M ITS group to discuss getting internet out at Peach Mountain. Observatory looks good, including the new paint job. Lots of good images of the observatories at Peach Mountain were shown.
Online Coordinator Jeff Kopmanis	Figured out how to fix the problems with YouTube. Tonight's meeting ran smooth.

Addendum

39 devices attended tonight's virtual meeting. 36 via Zoom, 3 via YouTube livestream

Adjourned

09:25:00 PM

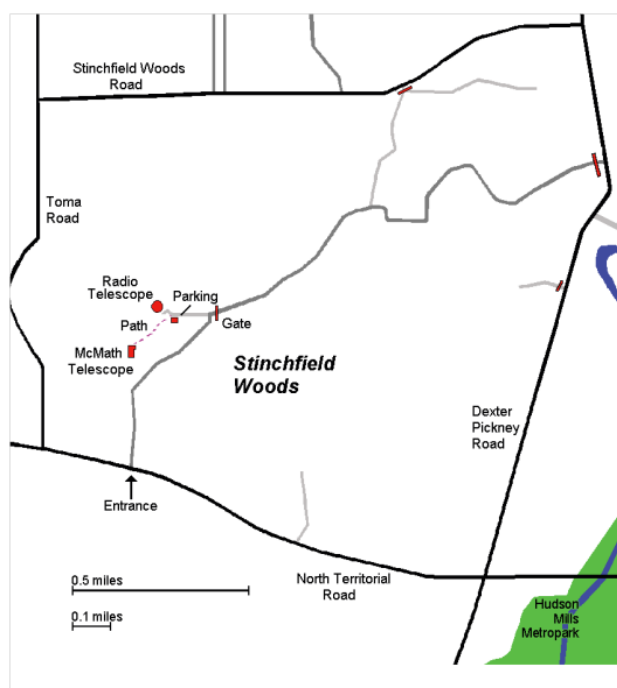
Minutes were taken and transcribed by

Adrian Bradley

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 or by mailing a check. For information about dues or joining the Lowbrows contact the club treasurer at:

lowbrowdoug@gmail.com.

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 or \$83.00/3 years

For more information about magazine subscriptions contact the club treasurer.

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
Online Coordinator	Jeff Kopmanis

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

University Lowbrow Astronomers
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Ann Arbor, MI 48113

STAMP