

REFLECTIONS / REFRACTIONS

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University Lowbrow  
Astronomers

March 2021

VOLUME 45, ISSUE 3

## Light Pillars

By Adrian Bradley



"I took this shot of Light Pillars over Alcona Dam Pond on Feb 13, 2021. I was initially going to try and capture the winter Milky Way over the pond, but seeing that it was cloudy, I considered turning around and going back home instead. Something in me said 'you'll regret not at least going out to see what kind of shots you can get... finish your mission!' So I turned \*back\* around and finished heading to Alcona Park. I got there, saw that the sky was still hazy, and proceeded to walk a little ways onto the frozen pond to take a few images. After aiming towards the distant town of Curtisville and taking a few shots, I looked on the screen and saw the colorful lines showing up. I thought at first I had an issue with the camera, but then looked out over the pond to try and spy those naked eye. Around me were two bright lights on nearby buildings that were also looking like columns of light. And I faintly saw those pillars over that small town. At that point I realized that I was seeing light pillars, and took more pictures of them including this one shown here."

## Remote Telescopes and Learning Astro-image Processing

By Glenn Kaatz

Clear nights in during the Michigan winter are rare. Not only are the opportunities for observing and photographing the night sky scarce, but if you are like me the cold limits our ability to stay out for the extended periods of time required to capture enough lights, darks, flats, and bias frames to produce a high-quality image. This is especially true if you use a DSLR like I do. I set up my gear in the back yard in the one spot where I can get a good view of Polaris and a relatively unobstructed view of the southeastern and southern skies. I use Astrophotography Tool (\$23) ([www.astrophotography.app](http://www.astrophotography.app)) for control of my DSLR, SharpCap ([www.sharpcap.co.uk](http://www.sharpcap.co.uk)) for guide camera focusing, and Phd2 (free) ([www.openphdguiding.org](http://www.openphdguiding.org)) for guiding, all of which require me to be sitting at my laptop next to my rig. Despite being only 50 feet away from the house, I frequently get very, very cold in winter OR eaten alive by mosquitoes in summer.

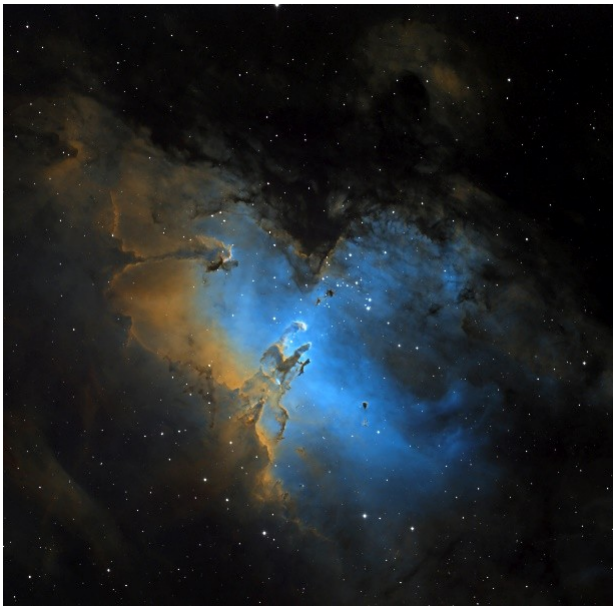
Processing the images successfully is the next challenge. After two previous (and unsuccessful) attempts to learn Pixinsight I tried StarTools (\$45) ([www.startools.org](http://www.startools.org)) and then AstroPixel Processor (APP; \$180) ([www.astropixelprocessor.com](http://www.astropixelprocessor.com)). I found APP to be relatively straightforward and produce nice results. However, further image processing requires a program such as Photoshop for the final touches that are most often necessary. Luckily, I already knew Photoshop well but there are other alternatives out there including Gimp (free) ([www.gimp.org](http://www.gimp.org)).

Because of the limited opportunities for imaging in winter, the narrow slice of sky available to me, freezing my you-know-what off or requiring a transfusion after feeding the mosquitoes, and my desire to get better at post-processing, I looked for remote telescopes from which I could access spectacular deep space objects and get the associated raw data to improve my skills. I found a subscription service called Telescope Live (<https://telescope.live>) which provides access to telescopes in Australia, Chile, and Spain. The Southern Hemisphere locations particularly drew me as many objects visible from there are not available to us. Depending on your membership plan, which ranges from \$4 to \$49/month, there is access to raw data from any of dozens of scheduled observations of interesting deep sky objects including various nebulae and galaxies. These targets change depending on what is accessible in the various locations based on the time of year. In addition, data from numerous professional-quality datasets can be downloaded. The stated goal of the organizers is to improve the image processing skills of their members by providing good quality raw data and many tutorials on how to best process those data. They favor using Pixinsight and Photoshop, and as such I decided to give Pixinsight a third try and took advantage of the 45-day free trial Pleiades Astrophoto offers ([www.pixinsight.com](http://www.pixinsight.com)). I did invest the time to obtain many, many raw data sets and watch several of the training videos, and quickly became more than adequate in the use of the software. The trick is to not get overwhelmed by the number of processing tools available, but rather to learn the core processes necessary to achieve an excellent result. This is the approach used in most of the tutorials. I can say that I was happy enough with the experience to buy a commercial Pixinsight license (\$280) and plan on using the software from now on. My approach is to get the raw data, which for scheduled observations most often includes two 5-min exposures each using luminosity, red, green, and blue or hydrogen alpha, oxygen III, and sulfur II filters that is already calibrated. In the warmth of my home, I take those data into Pixinsight to cosmetically correct, register, and integrate the frames. I then do any cropping necessary apply a permanent stretch to the integrated images, do noise reduction, and then export the files in TIFF format for further processing in Photoshop. After some Photoshop adjustments, which are nicely taught in the tutorials, the monochrome images are combined in Photoshop into a single RGB document. For narrowband images, instructions on how to record and then apply a nice Hubble palette action are provided as are methods to remove any gradients. My favorite is Gradient Xterminator ([www.rc-astro.com](http://www.rc-astro.com)), which is available as a Photoshop plugin for \$59.95. There is also a free trial so you can try out the software prior to purchasing it.



All of this may sound complicated, but it's actually pretty simple. I took notes during the processing tutorials and used them until I no longer needed that crutch. I would be more than happy to provide more information to anyone that wants it. Rest assured that if I was able to do this, so can you. Do not be afraid of Pixinsight! By the way, with Telescope Live you can submit advanced requests (for a fee, of course) for any deep sky object you please. You determine the object, the telescope you want to use, the filters and exposure times you need, and they do the rest. There also is an alternative remote imaging service called Slooh ([www.slooh.com](http://www.slooh.com)), which offers services like those provided by Telescope Live. I am sure others in the club know about it in much better detail than I do, possibly even having a membership there (\$100-\$300/year).

Here are two examples of images I processed using Pixinsight, Photoshop, and the training provided in the tutorials:



Eagle Nebula and the Pillars of Creation



Orion and Running Man Nebulae



### Don Fohey's Moon Clock

My Son designed and built this moon clock for me as a Christmas present. He programmed a computer chip to display the time, date and phase of the moon on a liquid paper type display, like on a kindle. The display updates every five minutes (limited by how often you can update the display without degrading it). He is now working on a software revision that will display moon rise and set times. He also 3D printed the attractive stand that holds the device. I am proud to own this unique creation.

## Review: Orion AstroView 120ST

By Jeff Kopmanis

My journey into astrophotography has been relatively short, and I've gotten quite far with my Celestron 8" Schmidt Cassegrain telescope (the "Orange Can") with its slower f/10 focal ratio. Known as a "planet killer", it has more than fulfilled its mission on that front, but when I turned to the deep sky, even with an f/6.3 focal reducer, it was still only poking a teensy hole in the sky and I was battling its pretty substantial vignetting as a result. Clearly, I needed something with a wider field of view than the SCT. Short tube refractors have a reputation as "wide field" telescopes, and since I have a soft spot for refractors anyway, this is where my journey begins.

It didn't take long to figure out that 3-element ED glass refractors were not going to be in my budget for quite some time (typically \$2500+). I really liked the 8" aperture of my SCT, so I was looking for how to get a larger-aperture refractor without selling my minivan. There are some nice 80mm options in the sub-\$1000 category, but 100mm or larger just wasn't in the cards until I tripped upon the 120mm **Orion AstroView 120ST** refractor for \$260! *Now we're talkin'!*



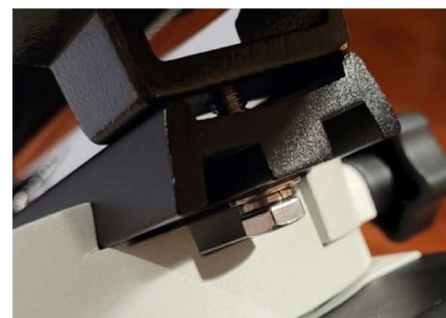
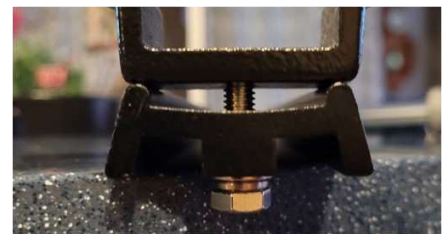
The 120ST is an f/5 short tube refractor with a 120mm 2-element objective lens and a 600mm optical length. It can handle 1.25" and 2" eyepieces and comes with a rack-and-pinion single-speed focuser. Orion says that the field of view is 2.1 degrees, which is a bit wider than my SCT+FR of about 1 degree. Tube brackets and a mounting plate had to be purchased extra, which after everything was added up, I ended up spending about \$330 to get something mountable.

The tube rings Orion sells are nothing special...cast, but they fit and work as-advertised. They do have felt linings, so as not to scratch the OTA, but are laughably thin. I ordered the 8" Vixen-type mounting plate, which turned out not to have the recessed bolt holes as did the slightly more expensive 13" Universal Plate. I did get something to work, but it limits the plate's travel on the mount to adjust

your balance (more on this in a bit). This would be a great time to mention that Lowbrow member, Clay Kessler, runs **Telescope Support Systems** (<http://www.telescopesupportsystems.com/>) in Manchester that makes mounting rings and hardware that are second to none. When I get my own observatory, I'll be talking to TSS about something more robust than the Orion cheapies.

I got it mounted up on an iOptron ZEQ-25GT and immediately, the balance issue raised its head. The 120mm objective is a big, *heavy* piece of glass that biases the weight balance to the objective end--not a bad thing, when you're planning on attaching cameras and other goodies.

The ZEQ-25GT mount has a generous clearing for the bolts (my iOptron AZ Mount Pro does not), so that if I filed the heads down just a tad, I'd have enough room to slide it back and forth on the ZEQ. With the aforementioned Universal mounting plate, or with a TSS plate, this wouldn't be an issue, but I plan on using the 120ST mainly with the ZEQ mount, so for now, my bolt head solution will work.





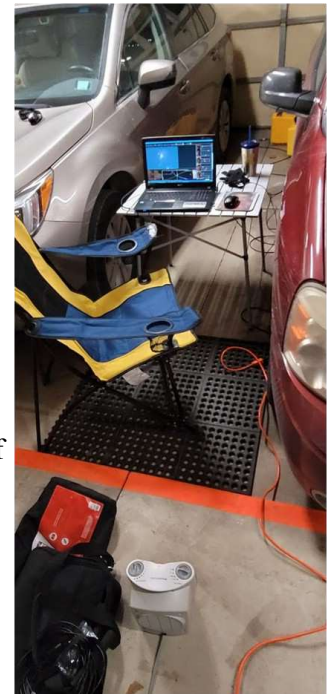


As I said, balance is an issue, but because the ZWO ASI294MC-Pro cooled camera setup I use for DSOs weighs over a pound, it balances the entire setup rather nicely. The ZEQ mount is new for me, so on my first outing, I decided to go with equipment I was familiar with (my iOptron AZ Mount Pro) and lucked out when I put the optical tube and camera setup on the AZ mount and it was perfectly balanced, even with the restriction in movement. I should also mention that on the AZ Mount Pro, no matter where the scope was balanced, the scope and camera are long enough that it'll hit the tripod legs on either end during the mount's alignment procedure. For this reason, unless I get a pier extension for my tripod, the AZ mount really can't be used with this refractor. I "fudged" and did my alignment without the

scope attached and then attached the mount when it was ready to do the final step. I had similar tight clearances with my SCT, so it's more of a limitation of the mount than a particular optical chain.

After the problems got worked out, the first outing was on January 11th, when it was a frosty 25F outside. Don't feel bad...I was sitting in my semi-heated garage 40ft away running the scope remotely! A 50ft active USB 3.0 extension cable provided the signal and control magic from the blue glowing USB hub to my AstroPC in my cozy garage nest.

Now, as the keen-eyed readers might have noticed, the focuser is extended nearly fully, and the camera is not a cooled camera. In fact, it is my normal planetary camera, a ZWO ASI183MC, which while noisy, was able to achieve focus. As I quickly found out, the back-focus distance is different on the Orion 120ST than on my Celestron SCT. It took me a day to figure out what the problem was, but it was due to a 50mm long adapter required by the Celestron that wasn't present on the refractor. The camera requires a total of 105mm backfocus, so the missing 50mm should put me back into the sweet spot. I did a little internet research and found this is a common problem with short tube refractors, and ordered an Astromania 50mm extension tube (with compression rings!) for about \$30. As a bonus, I'll be able to use its 2" size with the Orion's 2" focuser and eliminate a little vignetting in the process!



So...once I got the hardware issues out of the way, How did it perform? Fabulous! The field of view was everything I'd hoped for, and allowed me to get all of M42 (the Great Orion Nebula) in one field of view. The fast focal ratio ( $f/5.0$ ) gave me good results right away without having to wait very long before something showed up in SharpCap Pro's Live Stacking feature. As you can tell from the photo below, I did get some chromatic aberration, as expected, around the bright stars (the blue halos), but Brian Ottum pointed out that Photoshop has a Lens Correction tool that can help to eliminate the halos. The stack's edges have been clipped, but I didn't see any of the expected star smearing at the edges from the larger angles that a short tube refractor can produce. The single-speed focuser has reasonably fine control that I could achieve fine focus with, which I thought was going to be harder to do. It was smooth-working, and out performed my admittedly low expectations, given the price of the OTA and its cheap looking knobs. Nonetheless, since I've been moving to doing everything remotely to escape the frigid temps, I've got the Orion AccuFocus motor and an Astro-Gadget USB controller on-order. Look for those reviews in a future newsletter issue.



While I did the stacking (with AstroPixelProcessor) and did my own post-processing runs, I really liked the extra color and detail that Brian Ottum managed to coax out of my stack, so I've included his version of my results, since it really shows off just how much this inexpensive scope can do.

For \$360 total, I think it's a total "win" and I'm looking forward to more views of the deep sky wonders with the Orion AstroView 120ST refractor, now dubbed, officially and publicly, the "Coal Can".

**Links:**

Orion AstroView 120ST Tube Assembly

<https://www.telescope.com/Orion/Orion-120mm-f50-Refractor-Telescope-Optical-Tube-Assembly/rc/2160/p/9836.uts>

Orion AccuFocus: <https://www.telescope.com/Orion/Orion-AccuFocus-Electronic-Telescope-Focuser/rc/2160/p/7395.uts>

iOptron

<https://ioptron.com>

Astro-Gadget FocusDream controller

<https://astro-gadget.net/gadgets/control-of-focusers/focusdream>

Telescope Support Systems

<http://www.telescopessupportsystems.com/>

ZWO Astronomy Cameras

<https://astronomy-imaging-camera.com/>

SharpCap Pro (capture software)

<https://www.sharpcap.co.uk/>

AstroPixelProcessor

<https://www.astropixelprocessor.com/>

ProDigital Software (Astronomy Tools and AstroFlat Pro)

<https://www.prodigitalsoftware.com/AstronomyToolsActions.html>

<https://www.prodigitalsoftware.com/AstroFlatPro1.html>

Brian Ottum, Ph.D

<https://ottum.smugmug.com/>



**SUNDOG  
picture  
of  
the  
Day**

Jack Brisbin wrote in an email to members on Feb. 28th. "I was sitting on my deck in the sunshine, then a **weather wizard turned the cloud switch** on and as the clouds rolled in, I got this Sundog."

The February meeting was recorded and can be viewed on you tube.  
<https://youtu.be/m2N-UFJ9mvk>

**Upcoming Events**

The Messier Marathon is an informal event where Lowbrows will go to Lake Hudson and set up at the lake parking area in an attempt to view all the Messier objects in one evening. The primary date is March 13 which coincides with the new moon. A secondary date is Saturday, April 10th. The 13th of March will likely be cold. Emails sent from members to the members distribution list will be the only announcement that members have decided to brave the elements and travel to Lake Hudson. A good number of non Lowbrows folks have come to the location in past years. Even though the area is large, you should maintain distance between telescope and refrain from sharing eyepiece views.

**Open House events have been canceled until further notice.**

DATE	EVENT	LOCATION	
Friday March 19th 7:30 pm	Monthly Meeting	By Video Conference. Instructions will be emailed to members,	Tom Field, President Field Tested Systems LLC Contributing Editor, Sky & Telescope Magazine. Spectroscopy



## University Lowbrow Astronomers

### Monthly Club Meeting Minutes

19 February 2021, 7:36 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. Sean Gavin, Prof. & Associate Chair, Wayne State University, Physics/Astronomy

#### Subject

Delusion, Fusion and The Age of the Sun:

How a collision between Darwin and Lord Kelvin (sort of) gave rise to modern cosmology

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

### Business Meeting

Name	Topic
Webmaster Krishna Rao (1:36:53)	"All Things COVID" update and took questions. Michigan Medicine just finalized the policy for the rest of the academic year that still forbids in-person gatherings. Websites used: <a href="https://viz.covid19forecasthub.org">https://viz.covid19forecasthub.org</a> <a href="https://mistartmap.info">https://mistartmap.info</a> <a href="https://www.bridgemi.com/michigan-coronavirus-dashboard-vaccines-cases-deaths-and-maps">https://www.bridgemi.com/michigan-coronavirus-dashboard-vaccines-cases-deaths-and-maps</a> Report from Chatbox: have some uploads and maintenance to catch up on. The speaker schedule will be posted in addition to our calendar, as a quick way to scan just those events.
Vice President Adrian Bradley (2:13:47)	Has been traveling for unique photo opportunities lately. Is now the Treasurer for another astronomy club, the WAS. <a href="#">GLAAC</a> is still discussing <a href="#">Astronomy At The Beach</a> plans for this September.
Treasurer Doug Scobel (2:16:23)	\$9745.40 treasury balance with 162 memberships, which is increased by one since our last meeting.
Observatory Director Jack Brisbin (2:17:38)	The observatory looked good about ten days ago. The town is still having meetings discussing the proposed AT&T tower. The University's discussions about adding internet on Peach Mt are on hold, pending the town's tower decision. Charlie mentioned that he received a student's request to be allowed access to Peach Mt. to take pictures for a project he is working on. With the road being somewhat impassable with recent snowfall, it was agreed that the student would be offered the use of pictures that members have taken in the past.
Newsletter Editor Don Fohey (2:20:47)	Thanks to the many members this past month that responded to the earlier request for articles. Has not had anyone express interest in taking over as Newsletter Editor this April. Assembling an index of the four years of newsletters that I have published, indexing by article type, author, photos, and other criteria.
Online Coordinator Jeff Kopmanis (2:28:53)	Thirty-seven members today on zoom and six connected for the YouTube stream. Also, read the Webmaster's report from the Chatbox for those that might not have noticed it.
Adrian Bradley	Asked Richard Bell, of The Kalamazoo Astronomy Club to tell us about the club. The website is <a href="http://kasonline.org">kasonline.org</a> .
Vice President Dave Jorgensen	Report via email: We have a nice mix of member speakers and outside speakers lined up for the 2021 schedule, and that we have now begun filling speaker slots for 2022.

About 43 devices attended tonight's virtual meeting.

Adjourned  
10:07 pm

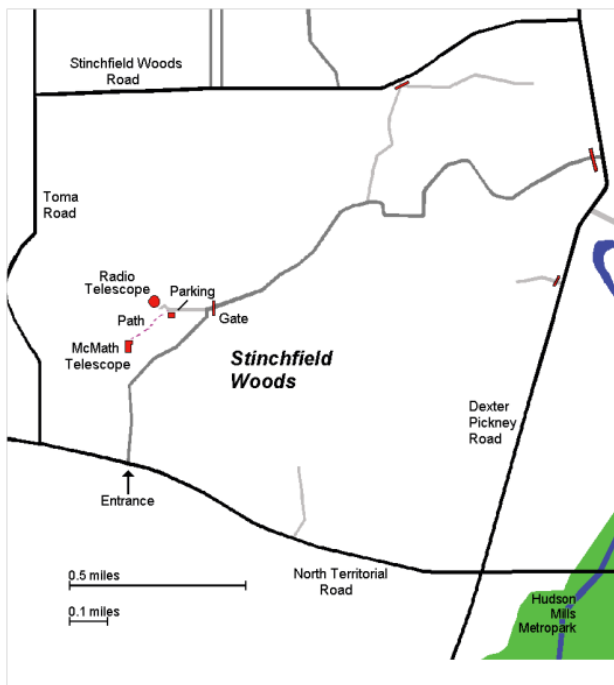
Minutes were taken and transcribed by  
Joy Poling



**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](mailto: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](mailto:donfohey@gmail.com) to discuss format. Announcements, articles and images are due by the 1<sup>st</sup> day of the month as publication is the 7<sup>th</sup>.

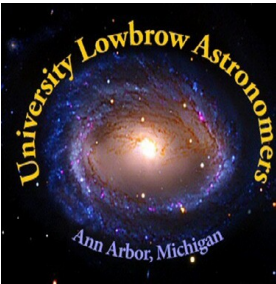
**Telephone Numbers**

- 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](mailto:Lowbrow-members@umich.edu)



# University Lowbrow Astronomers



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STAMP