

# REFLECTIONS / REFRACTIONS

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University Lowbrow Astronomers Monthly Newsletter

August 2021, Vol 45, Issue 8

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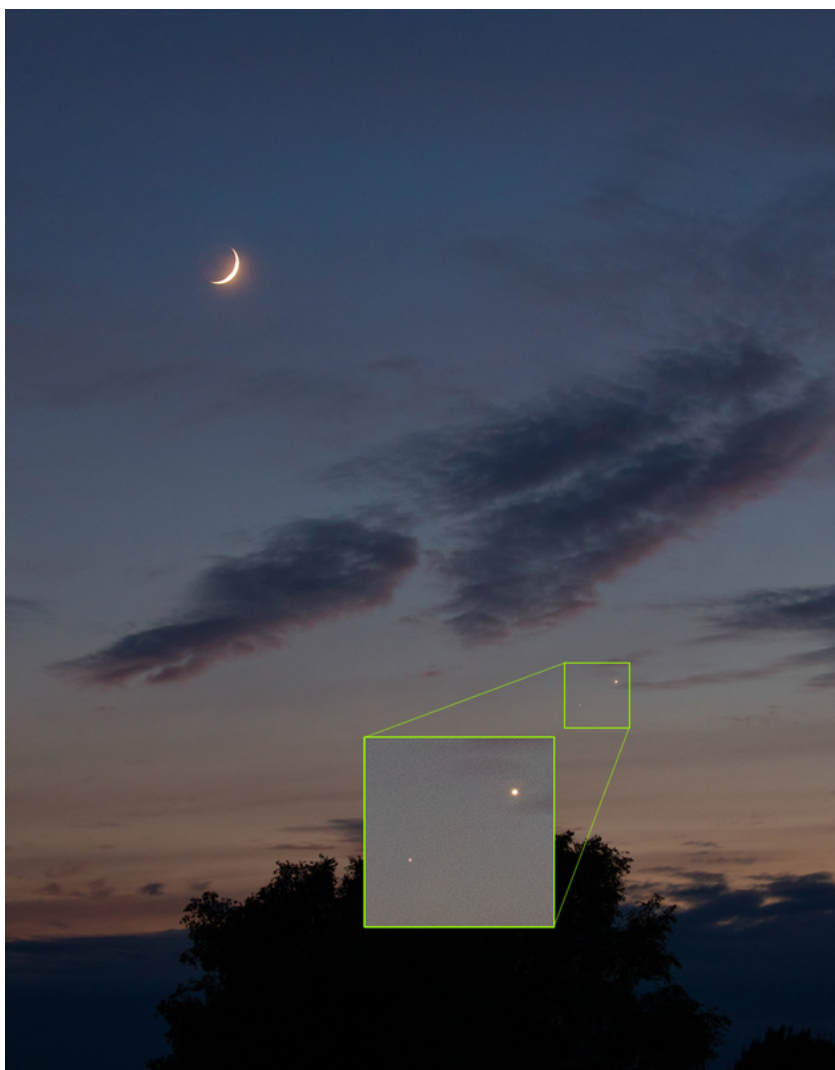
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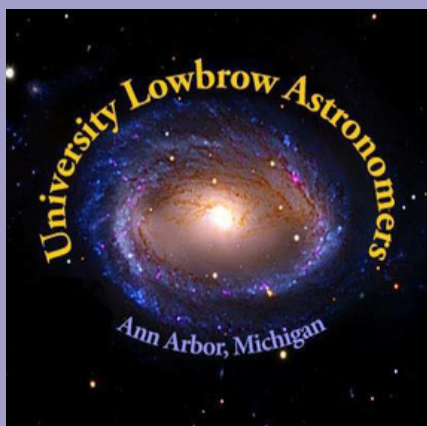
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## **CRESCENT MOON with VENUS & MARS** BY DOUG SCOBEL

On the evening of July 12, the clouds thinned just enough for me to squeeze off a shot of the crescent moon, Venus, and Mars. The brighter "star" below and right of center is Venus. Fainter Mars is to its lower-left, more clearly shown in the inset. Even though at the time this image was taken Mars was about 231 million miles from Earth, and Venus about 133 million, the two were separated in the sky only by about half a degree. The three-day-old crescent moon (which despite the clouds exhibits a little bit of earthshine here) was much closer, about 239 thousand miles. Now that's some kind of depth-of-field!



# MY BIG BLUE DOB (PART 4) CONSTRUCTION

BY DON FOHEY

The telescope was constructed using a table saw for all the rectangular parts and assembled with wood dowels and glue. A plunge router with a circle jig was used for all the round parts. It was fun cutting out the altitude bearing with its spokes for lightning and good looks.

The secondary cage was assembled using the V-block borrowed from the Lowbrow ATM inventory. The V-block insured that the top and bottom rings share a common center. Carbon fiber cross braces were used to stiffen the cage. These provided rigidity without adding much weight.

A lazy susan was used as the azimuth bearing between the ground board and rocker box instead of the traditional Teflon and Formica. This provides so little friction that a slight touch or the wind will rotate the telescope. This will be a great advantage when I add a motor drive. For manual viewing, I added a friction drag adjustment. A simple knob easily reached inside the rocker box can adjust the amount of drag.

Square aluminum tubes were used for trusses. I chose them because it was easy to modify the ends, to provide flat surfaces for attachment to the upper cage and mirror box. I found an anodizing source (thanks, Clay K.) but my costs were escalating and I elected to spray paint them black. I now wish I had anodized.



**Truss Pole Attachment to Mirror Box**



**Cutting out altitude rocker**



**Gluing secondary cage**



**Carbon Tube Cross Brack**



**Lazy Susan AZ Bearing**



**Drag Adjustment**



**Secondary Cage Attachment**



**Pivot Bolt Attachment**



I have helped repair several DOB's with encoders where the center pivot bolt had come loose so that the bolt turned on the threads of the T-Nut or the T-Nut came loose from the ground board. Instead of the traditional T-Nut, I drilled and tapped the end of the pivot bolt and bolted it to a plate using lock tight adhesive. This method still has the potential of the bolt loosening. It is less likely to come loose from the ground board than a T-nut.

**Continued, p.3**



## Big Blue Dob continued ...

The altitude encoder was mounted by its shaft bushing with a simple bracket. The bracket also protects the encoder from damage during transport. This method is superior to other installations where the encoder body is adhesively attached to the telescope. (i.e. club 17") A long reference arm reduces the error caused by any off-center mounting of the encoder.

The azimuth encoder is installed in the bottom of the mirror box attached to the pivot bolt as it is in most DOB's. The encoders are connected to an adapter box of my own design which communicates their position via Bluetooth to Sky Safari. I will make a unit at my cost for any club member who would like one.

I don't believe you build your own telescope to save money. Commercial folks have economies of scale and experience to provide instruments for good value. I kept records of my cost and below is a summary.

Cost Summary	
Optical: Mirror, Secondary, Holder, Focuser, Spider	\$1,235.51
Metal: Plate, Bars and Tubes	\$224.62
Wood: Baltic Birch, Pine	\$270.87
Hardware: Misc, Knobs, Clamps	\$101.93
Kydex Flocking, Fabric, Teflon, Paint	\$114.28
AZ Bearing, Circle Jig, Dew Guard, Encoders, Telrad	\$367.51
Grand Total	\$2,314.72

I want to thank those who helped me. Russ Vente for the mirror and ideas. Jack Brisbin for the V-Block and the altitude bearings which he fabricated from his precious stock of Ebony Star Formica. Dave Jorgensen for cutting and machining the mirror cell triangles, bars, and truss poles.



View of the Mirror



Altitude Encoder Mounting

The light rays of f4 optics converge sharply at the focal plane and eyepiece focus changes with slight adjustment. For this reason, I have selected a Moonlight dual speed focuser. The great advantage of the f/4 optics is that I can stand with both feet firmly on the ground and look thru the eyepiece with the telescope pointed at the zenith.

Why a Big DOB? I believe this is the latest big DOB acquired by any club member in recent years. The trend seems to be: buy a modest scope, a good tracking mount, and add a camera. I ask the rhetorical question. If you take an image of an object that you can't see with your eye have you seen it? I want to see the Horsehead Nebula with my own eye and join the elite number of club members who have done so. I have seen countless images of the Horsehead but I have not seen it. In an evening I will enjoy and ponder a dozen or so objects during the time it takes to image one object. For me, observing thru the eyepiece is a much more enjoyable evening.



Packed up Ready to Travel

# OBSERVATORY GRAFFITI

BY JACK BRISBIN

Over the past couple of years, myself and other club members have participated in refurbishing the Observatory. It started with the adventures in scraping and painting the roof I beam support system, then the roof and the building walls were finished in 2020. The building looked great!.

Then came the graffiti that some members predicted would happen. We are not sure of the exact date but we believe it happened between July 7 to July 15. You can see the symbols that were painted and there was some discussion on what they mean. But we do not know exactly the intent of the graffiti.

What we do know is this; The University of Michigan Police were contacted and they did send a patrol to investigate the complaint. If you go to the U of M DPSS website and click on the Crime and Fire Log for 7/15/2021, you will see a property damage report and a case number #2190302199.

There are a couple of places in downtown Ann Arbor that are called Graffiti Ally and there is some argument between the term legal and not legal. Observatory graffiti is considered property damage like the graffiti that was written on the Radio Telescope Observatory building.

If you visit a social media site such as Facebook, Instagram, Pinterest, or any social media site, you might see a person posting a picture and bragging about the graffiti they did to the Observatory.



If you do, please feel free to contact the U of M Police and refer them to the above-mentioned case report and social media site. Thank You!

Members and the General Public have asked when the Lowbrows will start Public Open House Observing sessions at Peach Mountain again. We won't know the exact date until the U of M Covid 19 Campus restrictions are lifted in accordance with the State of Michigan guidelines. There is a possibility of starting by October 2021. Maybe!



Wildfires triggered some inspired photos of our sun and moon, such as this one by Adrian Bradley. More on page 6.



# FIREWORKS GALAXY

BY DOUG BOCK

This month the weather has been poor with cloud cover and wildfire smoke inhibiting imaging, but I did manage to do some work on the night of July 1-2, 2021.

This time we have a new ZWO asi2600MC PRO camera to work with on the 10" f/8 RC telescope. (~2010mm focal length).

The target this month was NGC 6946, the Fireworks galaxy. NGC 6946, sometimes referred to as the Fireworks Galaxy, is a face-on intermediate spiral galaxy with a small bright nucleus, whose location in the sky straddles



the boundary between the northern constellations of Cepheus and Cygnus. Apparent magnitude: 9.6.

Data Acquisition: 37 x 300 second subs, at a gain of 100, temp 0C, along with darks and flats.

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# EAGLE NEBULA

BY GLENN W. KAATZ

I completed 2 hours 20 minutes of image capture on M16 (28 five min images), and used Pixinsight and Photoshop to process them. My imaging rig was a Williams Optics Z61 doublet refractor with a dedicated field flattener attached, an ASI294MC pro camera, ASlair pro controlling everything, an L-Enhance filter, and a Celestron CGX mount.

Guiding used a Williams Optics 120 mm guidescope and an ASI174MM mini camera.

While more imaging time would improve the detail, I was pretty satisfied with the result.

I would have liked to capture more of the OIII blue color in the center of the nebula, but the



filter I have doesn't do that well.

Maybe the L-Extreme may perform better, or for sure a monochrome camera with the proper narrowband filters. Right now I don't have the disposable income to manage the latter.

I hope that you enjoy the image nevertheless!

## ASTROPHOTOGRAPHY TIP OF THE MONTH: Imaging the Perseids (from *Brian Ottum*)

- Get to a dark sky on the night of Aug 11-12
- Charged battery, with room on the card
- Can start shooting at 10:30 pm, but prime is 1 am to 5 am
- If DSLR/mirrorless, use the widest and fastest lens you have. Ideal is <math><24\text{mm}</math> and <math><f/2.8</math>. The newest phones can also work.
- Try to find a nice foreground with water, trees, interesting buildings
- Place on a tripod
- Use an intervalometer (order one that fits your model on Amazon for ~\$20)
- If you've kept camera cool (and not in a hot car), you can go up to ISO 1600 or 3200
- Focus very carefully on a bright star or distant light (then tape to ensure no movement)
- Use disposable hand warmers attached to underside of lens hood to eliminate dew
- Shoot wide open and as long as you can before the stars start to streak, or light pollution overwhelms (10 to 60 seconds)
- Shoot any direction where you can catch lots of sky (directly towards DblCluster radiant not recommended)
- Set the intervalometer to shoot for 1-4 hours and leave it
- Alternatively: point near Polaris, take 5-20 second shots and then stack them to get those nice arcs and the occasional Perseid
- If you have a tracker, be careful not to run it so long that you are taking more shots of the ground than sky
- Take LOTS of shots. It is amazing to me that even with a wide-angle lens, only about one in a hundred captures a meteor.

## PHOTOS OF OUR STAR FILTERED THROUGH FIRE SMOKE



from Brian Close



from Jack Brisbin

### MEETING SPEAKER SCHEDULE

**AUGUST 20:** Jodi McCullough, Lowbrow member. Topic: *Use of Images Plus*

**SEPTEMBER 17:** Professor John Monnier, U-M. Topic: *Telescope Interferometry - Stars and Exoplanets*

**OCTOBER 15:** Associate Professor, Keren Sharon, U-M Astronomy. Topic: *Gravitational Lensing*

**NOVEMBER 19:** Dr. Fred Adams, U-M. Topic: *TBA*

**DECEMBER 17:** Don Fohey, Lowbrow member. Topic: *The New Horizon Mission to Pluto*

# University Lowbrow Astronomers

## Monthly Club Meeting Minutes

16 July 2021, 7:35 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. Thomas Zurbuchen, Associate Administrator of Science for NASA

**Subject**

Together We Explore

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

### Business Meeting

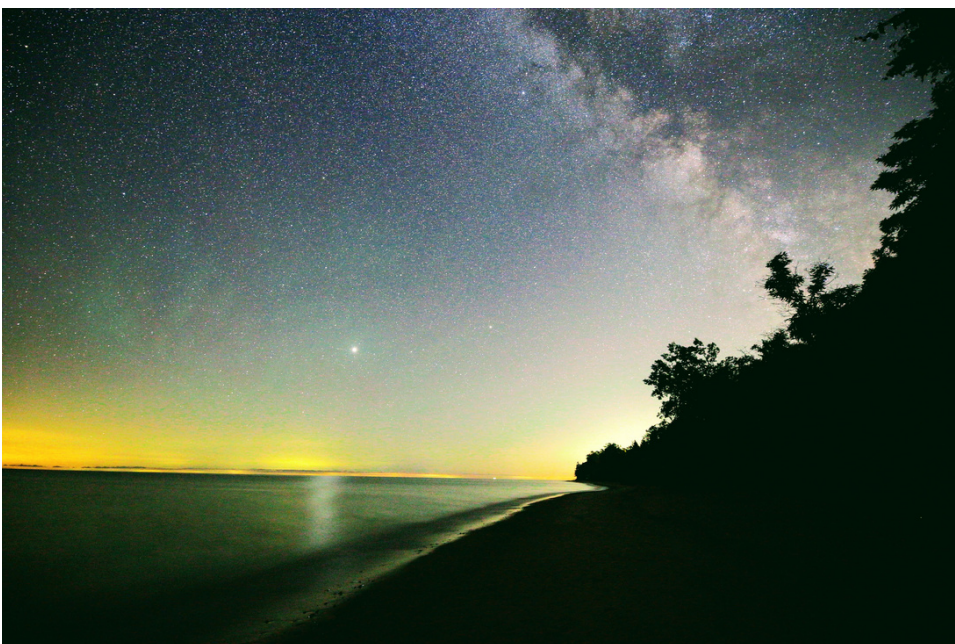
Name	Topic
President Charlie Nielsen	Long-time U of M Exhibit Museum Planetarium manager Matt Linke has retired after over 30 years and has accepted our offer to become an honorary Lowbrow.
Vice President Joy Poling	Still awaiting any new info about when meetings can be held in person so the events calendar can be updated.
Vice President Liz Calhoun	Still holding onto the Peach Mountain keys for Jim Forrester until he completes some out-of-town travel.
Vice President Adrian Bradley	<ul style="list-style-type: none"><li>• Been keeping busy with outreach in multiple clubs.</li><li>• Still doing online outreach every Tuesday evening with <a href="https://www.explorescientific.com/live">ExploreScientific.com/live</a>.</li><li>• The online conference of the Astronomical League (<a href="http://www.astroleague.org">www.astroleague.org</a>) is coming up in August.</li><li>• This year, Astronomy At The Beach (AATB) will be an in-person event on September 24 &amp; 25 with no guest speakers, tent events, or concessions available, just your basic star party. John Wallbank reminds us that GLAAC is looking for telescope volunteers, and they would like to know soon so they can get a count and plan accordingly. Masks will be required and provided.</li></ul>
Observatory Director Jack Brisbin	<ul style="list-style-type: none"><li>• At the Observatory, the tree maintenance group has had a limited number of days without rain, leading to a less productive summer than expected.</li><li>• On the most recent visit, graffiti was noted on the newly painted</li></ul>



	walls. Many pictures were taken to document the vandalism. The police were called, and a report was filed. Later, the appropriate parties at the U were emailed copies of all info. Concern that if we paint over it, they will just do it again was expressed. Discussion about how to proceed followed with many ideas; however, nothing was decided.
Treasurer Doug Scobel	<ul style="list-style-type: none"> <li>• We have 169 memberships, including Matt Linke who was newly added as an honorary member. Eight of the 169 are folks whose memberships would have expired but for grace extended due to COVID-19 pandemic considerations.</li> <li>• We have \$10,385.70 in the treasury.</li> <li>• Since our June meeting, our one major expense was \$235.00 sent to the Astronomical League on Lowbrow members' behalf. Thirty Lowbrows either joined or renewed their memberships for the Astronomical League's July 2021 through June 2022 fiscal year.</li> <li>• Other expenses include payments for our usual monthly newsletter printing/ mailing costs, our monthly fee for maintaining our open house telephone "hotline", and the cost to mail a t-shirt to our June speaker Awni Hafedh.</li> <li>• I also submitted our annual federal "ePostcard", which states that (a) we are still "in business", and (b) our annual receipts are under \$50,000.00. Submitting the ePostcard annually is a requirement to maintain our 501(c)(7) social club status.</li> </ul> <p>*Treasurer content emailed for transcription accuracy and ease</p>
Jim Forrester	A document describing proper email etiquette is being drafted after discussion at the recent Communication Committee meeting. Tomorrow, along with Don Fohey, will be driving out to help a relative of one of our deceased members, catalog and appraise their astro items for future sale.
Approximately 30 devices attended today's meeting.	

**Adjourned**  
9:42 pm

**Minutes were taken and transcribed by**  
Joy Poling



## JUPITER REFLECTED IN LAKE HURON

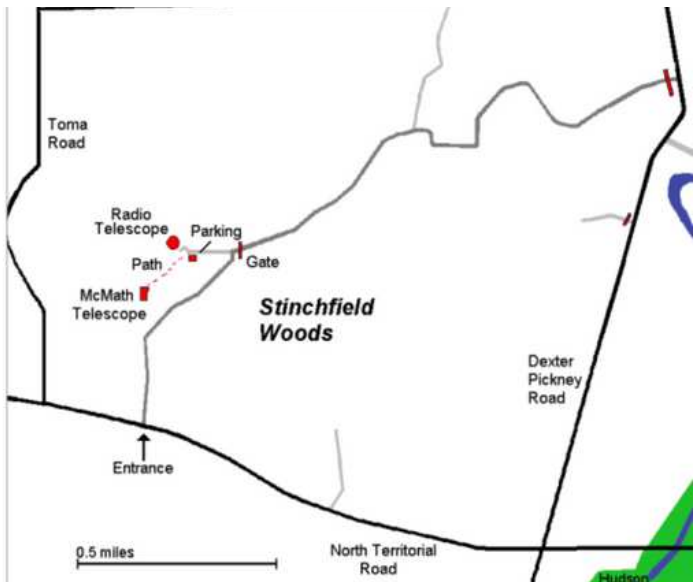
BY ADRIAN BRADLEY



## PLACES & TIMES

Monthly meetings of the University Lowbrow Astronomers are held the third Friday of each month at 7:30 p.m. The location is usually Angell Hall, ground floor, Room G115. Angell Hall is located on State Street on the University of Michigan Central Campus between North University and South University Streets. The building entrance nearest Room G115 is the east-facing door at the south end of Angell Hall.

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). You can have the newsletter mailed to you with an additional \$18 annual fee to cover printing and postage. Dues can be paid by Venmo, PayPal, or by mailing a check. For details about 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

### 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](mailto: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:	Adrian Bradley (313) 354-5346
	Joy Poling
	Liz Calhoun
	Dave Jorgensen
Treasurer:	Doug Scobel (734) 277-7908
Observatory Director:	Jack Brisbin
Newsletter Editor:	Amy Cantu
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 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](mailto:Lowbrow-members@umich.edu)



# University Lowbrow Astronomers



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