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NGC 7000, NORTH AMERICAN NEBULA

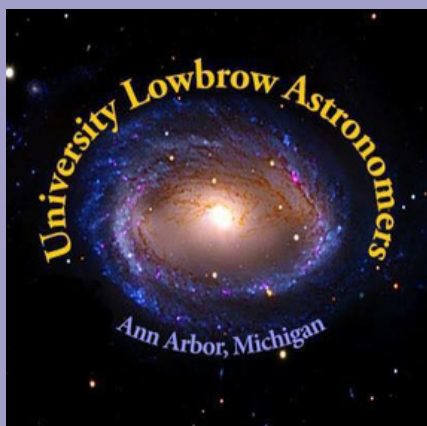
BY DOUG BOCK

On May 18, Doug emailed the group: "I've been testing out Adrian's 300mm f/4 prime lens with my Canon T3i, piggyback on the 10" RC in the observatory. Here is the latest result from last night's run (this morning).

When I consider the T3i is noisy, this didn't turn out too bad. I'd like to try my ZWO camera on that lens, but need an adaptor to connect and focus with, which may be available from another local astronomer. Stay tuned for more experiments.

144 subs, combined 60 and 120-second exposures @ ISO 1600

The North America Nebula is an emission nebula in the constellation Cygnus, close to Deneb. The shape of the nebula resembles that of the continent of North America, complete with a prominent Gulf of Mexico."



MY BIG BLUE DOB (PART 1)

BY DON FOHEY

I have always wanted a big telescope and had the opportunity when my friend Russ Vente gave me a mirror. Now, this was not an ordinary mirror! It was a 14 3/4 inch diameter 0.7 inch thick fused quartz which weighed a mere 9.5 lbs and has a coefficient of expansion 1/15 that of glass. It had a polished and figured f/4.1 aperture of 14 1/4 inches. He commented that it was slightly undercorrected.

There are a couple of ways to evaluate a mirror. My friend had evaluated it with double-pass autocollimator. This is a Ronchi-style test using a full aperture optical flat. A perfect parabola produces nice straight lines.

I looked at the mirror with a knife edge at the 70 percent zone and the mirror looked smooth with a nice shape. I then took knife edge zone measurements (Foucault Test) and found the mirror to have a 3 wave error! How can this be? It turned out that my friend had made his own optical flat (a very difficult task) for the double-pass auto collimator. The optical flat was not flat and that caused the optical flat error to be made into the mirror. So onward to figuring the parabola.

I had some previous experience, I had ground, polished, and figured an 8 inch f/8 mirror to a 1/7 wave error. To correct the 14" mirror I used my 8" tool and tried some touch up with a 4" and 6" tool. I made good progress at first but got to the point where my efforts were not improving the figure and were introducing other troublesome features. I quit after 26 figuring sessions. The error had been reduced to about 1/4 wave but the measurements taken by turning the mirror 90 degrees were different and indicated a 1/2 wave error. I had introduced some astigmatism. The 70 percent zone knife edge image indicated an abnormal figure and the Ronchi image indicated some tilt indicative of astigmatism. I needed a full-size tool which I didn't have and I needed help. I emailed Steve Swayze my results. (<https://www.swayzeoptical.com/>)

He phoned me and at first was reluctant to work with a thin mirror. He had several hopelessly

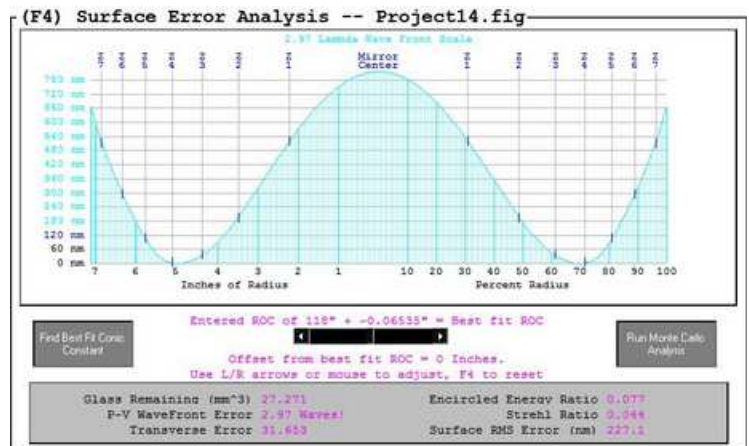


Knife at 70% Zone



Mirror on Working Stand

bad thin mirrors sitting on his shelves. I explained that I had sent him Ronchi images, He then looked at the Ronchi email attachments and said that it didn't look so bad. It would actually give some reasonable images as it was. If I sent him the mirror, he would put it on his bench and evaluate it. The evaluation fee would be put toward the figuring fee if his evaluation confirmed he could improve it. He called after receiving the mirror and said he could improve it. It would require making



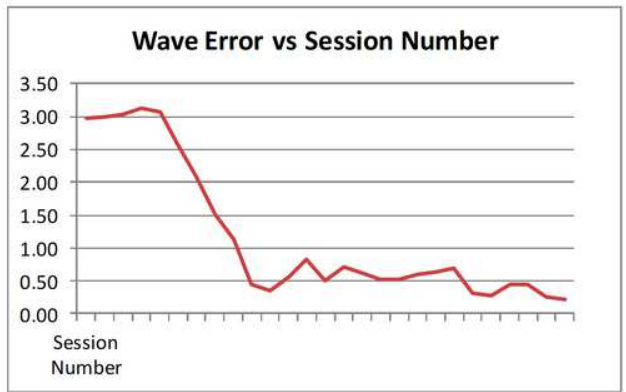
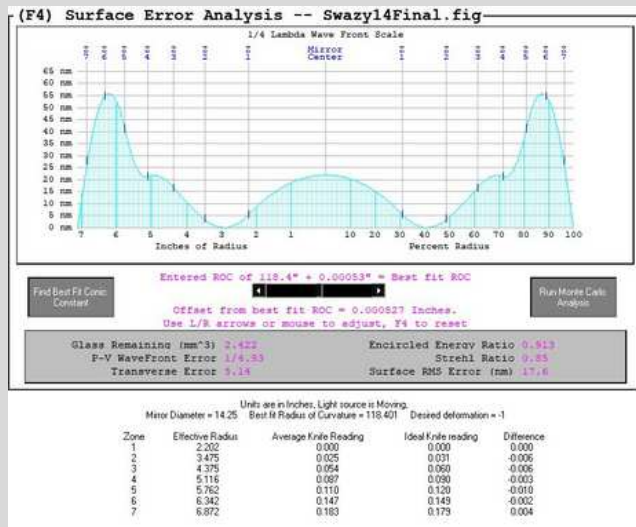
Units are in inches; Light source is Fixed.
Mirror Diameter = 14.25 Best fit Radius of Curvature = 117.535 Desired deformation = -1

Zone	Effective Radius	Average Knife Reading	Ideal Knife reading	Difference
1	2.252	0.000	0.000	0.000
2	3.475	0.016	0.061	-0.045
3	4.375	0.026	0.121	-0.095
4	5.116	0.053	0.181	-0.128
5	5.762	0.063	0.240	-0.177
6	6.342	0.113	0.300	-0.187
7	6.872	0.159	0.359	-0.200

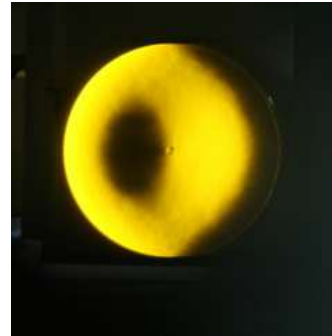
BIG BLUE DOB, cont...

a full-sized tool and putting it on his machine. When finished he would send the mirror out to Spectrum Coating who would return it to me when finished. The mirror arrived with an enhanced coating. **Hurray!!!! I have a mirror.**

I measured the mirror returned from Swayze to be about 1/5 wave. I had steadily improved my knife edge tester, and near the end changed to a moving source configuration. (1/2 as sensitive but better shadows). There is a limit to the accuracy that can be measure with a knife edge test. Notice that my maximum knife edge measured error is only 0.010 inches. My typical repeatability when judging the zone shadows is in the 0.002 to 0.004 inch range. Many readings help but it is hard to certify a mirror below 1/4 wave with the knife edge technique.



Error measured by knife edge decreased



Knife at 70% Zone



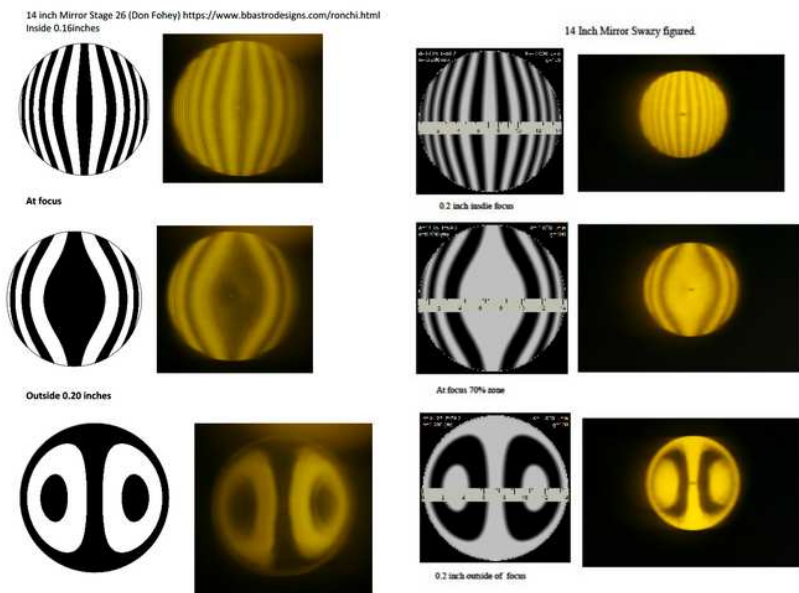
Zone Mask. I would measure zones 1, 3, 5, 7 and then rotate for zones 2, 4, and 6



8 inch synthetic pitch tool with polish.

Ronchi Images: Left, my stage 26; Right, Swayze. Note that the inverted image is obtained by centering on either a line or slot of the grating. The right images are certainly better.

Yea! I have a mirror, now I can make a telescope! (Next month: Part II)



TWO VIEWS of the SUPER FLOWER BLOOD MOON LUNAR ECLIPSE, MAY 26, 2021



ABOVE photo submitted by Brian Close



**LEFT photo submitted by Brian Ottum,
from his telescope in New Mexico**

Brian writes: "Here's my shot of this morning's total lunar eclipse. Out in the NM desert, the moon was setting in the SW as totality and dawn approached. So the moon was only 8 degrees above the horizon. Pesky clouds were around but I was able to dodge them for this."

NIGHT SKY

(apologies to William Blake)

Clear, dark, moonless nights

Speckled here and there

With lanterns burning bright

In patterns ancient mankind

Marveled, storied, mythicized

As seasons changed and rearranged

Paths of lanterns burning bright

In the magic sky at night



PINWHEEL GALAXY by Glenn W. Kaatz

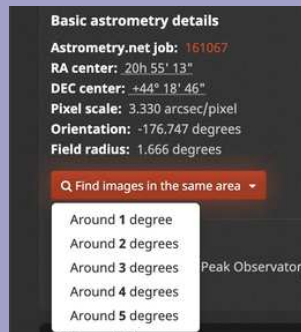
50 lights, 20 flats, 20 darks, 100 bias frames. Camera was an ASI294MC pro; telescope was an 8 inch Edge HD with a 0.7 reducer; guide scope was an Orion 60 mm with an ASI120MM mini guide camera.

ASTROPHOTOGRAPHY TIP OF THE MONTH

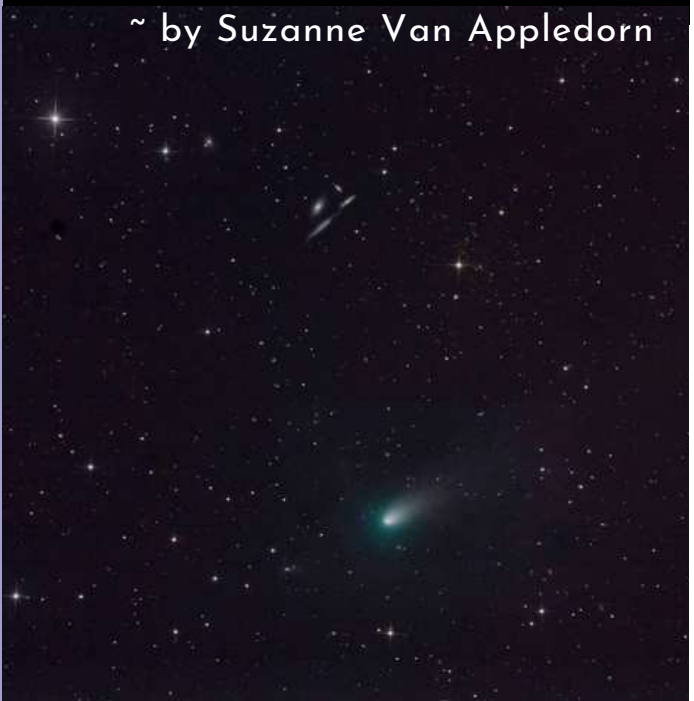
Astrobin (astrobin.com), the image hosting and social media site, has added new features in the past year - some only available with a paid subscription - making it a powerful online tool for both inspiration and planning. Recent upgrades include:

- an advanced plate solver powered by PixInsight with mouse-over access to objects within the image frame
- browse by constellation
- search filters by subject, telescope, camera, and (new!) Bortol scale
- the ability to search images in the same area within a range of degrees

As always, you can also review detailed technical specs, bookmark images, join forums of like-minded enthusiasts, follow, and communicate with individual astrophotographers.



~ by Suzanne Van Appledorn



COMET R4 ATLAS by Brian Ottum

Comet R4 Atlast passes by a quad of galaxies in the constellation Coma Berenices,

MYSTERY OBJECT NEAR LUNAR DISC

BY YOGESH CHAVARKA

At 3:37 p.m. on May 17, Yogesh emailed the group, "Dear Lowbrows - sharing this to pass on a query (or hunt) for objects near the moon. I have been looking around various apps and databases to see if I can make sense of this. Also, the phenomenon may be more common or seen by folks in our group, but [I'm] passing this along to enrich my understanding as it's the first time I have noticed something like this.

May 13th was a crescent moon with clear skies and a lovely earth glow on the dark part of the moon phase. At 9:25 PM I pointed my 8" tincan to capture the earth glow of the dark lunar disc to get a few exposures. That's when I noticed some kind of conjunction near the west (ocean of storms) side of the lunar disc. After looking at some more exposures from 9:25 PM thru 9:30 PM the object moved closer and disappeared as it touched the lunar disc. See the attached PDF with the progression of the bright spec

It was definitely not moving as fast as a plane or satellite. So I uploaded the images to astrometry.nova.net which failed as there were no stars to map the area. I also looked up some asteroid and NEO databases with nothing that could be seen around the moon that day. My other wild guess is that it may have been a meteor that ended up in lunar impact where I missed the impact shot between 9:29 PM and 9:30 PM.

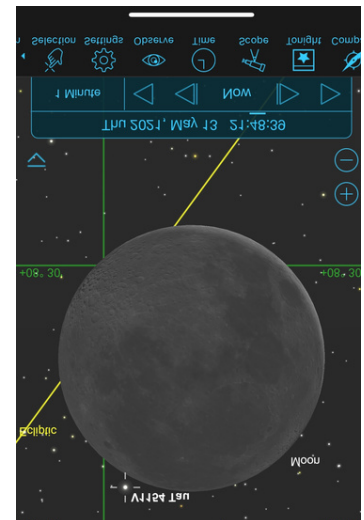
So far I've been unable to find anything in the databases that tracked lunar impacts from meteors either. It would be helpful if any of you could help cut this curiosity chase and throw some light on my ignorance of the phenomena."

Series of photos sent by Yogesh showing the time when the object disappears



Howard Ritter sent this Sky Safari screenshot to show that Yogesh had captured the occultation of star SAO 76954. This seemed the best explanation, but he and Jim Forrester both noticed the times didn't match.

After emailing back and forth about the timing, Yogesh eventually discovered the timestamp setting was off on his DSLR camera.



By 8:52 p.m., Lowbrow detectives Jim and Howard have solved the mystery.

Yogesh writes, "Jim and Howard - now this is real expertise from both of you, I must say. I checked the times on my DSLR and [it was] 20 minutes off (behind). With that, the SkySafari maps that you both pulled up were right on spot. The actual time when I took the pictures was from 9:45PM to 9:50PM from Pittsfield Township/Ypsilanti.

This is an extremely valuable lesson ... for me to sync up times on all the equipment before starting the photography session. I enjoyed the lunar UFO hunt (that wasn't) thoroughly."

University Lowbrow Astronomers

Monthly Club Meeting Minutes

21 May 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

Jim Shedlowsky

Subject

The LSST - Faster, Wider & Deeper

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 (1:00:12)	Will be organizing an officers' meeting soon.
Vice President Liz Calhoun (1:01:40)	Has Jim Forrester's key while he is in Seattle.
Vice President Joy Poling (1:04:48)	Continues to update all events on Night Sky Network and Google Calendar to online.
Vice President Adrian Bradley (1:05:20)	Has been doing online outreach every Tuesday evening with ExploreScientific.com/live.
Webmaster Krishna Rao (1:08:26)	<p>After a recent discussion about how to post to our different Media sites, the following is currently in place and functioning:</p> <ul style="list-style-type: none">• Posting to our Blog will simultaneously also post it to our Twitter and Facebook accounts.• Posting to our Instagram will simultaneously also post it to our Twitter and Facebook accounts.• Adding an event to our Google Calendar will simultaneously also post it to our Twitter and Facebook accounts. <p>The theme being that no one needs to post to Facebook or Twitter directly. Some functionality recently broke, and is currently researching new hosting providers. Finished posting the last newsletter and fixing things on the lowbrow website and the young astronomer website. Everything should be up and running right now.</p>
Observatory Director Jack Brisbin (1:14:05)	<ul style="list-style-type: none">• <u>Recently noticed</u> a problem with the Argo Navis. After seeing a message displaying "RTC Battery Flat," a fresh battery did not fix the issue. Will continue troubleshooting for now, but if it cannot be resolved, a decision to purchase a new one may come in the future.• Is trying to organize another tree trimming and maintenance event, weather permitting.• Has not heard any new info on the proposed AT&T tower.
Vice President Dave Jorgensen	Met with the new group, Chelsea Dark Sky, to help draft recommendations

[1:22:50)	for Chelsea to consider for updates to the zoning ordinance.
Online Coordinator Jeff Kopmanis (1:24:34)	<ul style="list-style-type: none"> • Meeting attendance today reached a max of 36, with 34 on Zoom and 2 on YouTube. • Held the first Communication Committee meeting on May 5th. • Meetings will now be held on the 1st Wednesday of the Month, every other month at 8pm. At the next meeting, a document will be finalized about email usage and best practices and how to use the resources we have. The next meeting will be on July 7th.
Treasurer Doug Scobel	<p>By email: We have \$10,280.79 in the treasury. \$150.00 of that is Astronomical League dues collected so far that I will be paying on members' behalf at the end of June. We have 166 memberships, including two new members since our last meeting. Our only expenses were hard copy newsletter print and mail costs for April and May.</p>

Adjourned
8:54 pm

Minutes were taken and transcribed by
Joy Poling



PANORAMA OVER LAKE HURON by Adrian Bradley

University Lowbrow Astronomers - Communications Committee

May 5, 2021

<https://umich.zoom.us/j/96335537161>

Chair: Jeff Kopmanis

Attendees:

- Jeff Kopmanis, Online Coordinator (Chair)
- Charlie Nielsen, President
- Krishna Rao, Webmaster
- Amy Cantu, Newsletter Editor
- Adrian Bradley
- Steve Howey
- Jim Forrester
- David Snyder

Announcements:

1. May 18, UM will be requiring a passcode or waiting room for all Zoom meetings

Topics:

1. Establish regular monthly LCC meeting day/time.
 - 1.1. 1st Wednesday of the Month, every other month, 8pm
 - 1.2. Next meeting is July 7, 8pm
2. Email issues
 - 2.1. Tutorial on email usage in the Lowbrow club
 - 2.1.1. Sending pictures
 - 2.1.2. Quoting without attachments
 - 2.1.3. filters, automation
 - 2.1.4. JimF - first draft
 - 2.2. Lowbrow email groups (MCommunity)
 - 2.2.1. Can forward to archival groups
 - 2.3. Mass-mailing (Mailchimp?)
 - 2.4. Forums: Groups.io, Google Groups, Slack
 - 2.4.1. Archival features are good
 - 2.4.2. Search must be part of archival
3. Web
 - 3.1. Web site version 2: Content Management System (CMS)
 - 3.1.1. Hasn't been easy to expand/grow
 - 3.1.2. Where are new members coming from and what expectations? (Ask Doug Scobel)
 - 3.1.3. Home page: needs to be a source of quick information for common questions. Amy "More Dynamic", fresh
 - 3.2. Systems:
 - 3.2.1. WordPress
 - 3.2.2. Squarespace
 - 3.2.3. Drupal
 - 3.3. DNS issues - Hover - Resolved by KR and Hover

- 3.3.1. KR: setup method to notify when web sites are unreachable - UptimeRobot
- 4. Newsletter
 - 4.1. Distribution
 - 4.1.1. Send to lowbrow-members@umich.edu
 - 4.2. Web archival
 - 4.2.1. Would be nice if posting were more automated (as in submission via CMS)
 - 4.3. Printed
 - 4.3.1. 600dpi is typical for professional publications
- 5. Social Media
 - 5.1. Tools for digital outreach:
 - 5.1.1. Facebook - currently being used and maintained by Adrian Bradley
 - 5.1.2. Twitter - posts to FB and blog (<http://lowbrows.blogspot.com>)
 - 5.1.3. Instagram - Jenna Forrester maintains
 - 5.1.3.1. There is an email address that will post to all systems (FB, IG, TW)
 - 5.2. Updates perhaps automated via Web/CMS?
 - 5.3. More methodical updates to increase the value of social media resources
- 6. In-Person activities
 - 6.1. Outreach events (speaking at seminars, meetings)
 - 6.1.1. Covid Status - email and web banner(?)
 - 6.1.2. Where to view
 - 6.1.2.1. Peach Mountain (Bortle ~4.5)
 - 6.1.2.2. Brower Nature Preserve (South of Dexter)
 - 6.1.2.3. Hudson Lake State Park
 - 6.1.2.4. Independence Park (Canton)
 - 6.2. Establish an outreach calendar
 - 6.3. Besides helping at Peach Mtn nights and speaking, what other outreach activities should we be doing as a club?
 - 6.4. Participation in MMSS, GLAAC and AATB
 - 6.5. Peach Mountain Facilities Manager: "Sushila", holds Key authorization
 - 6.5.1. Jim Forrester would like to transfer the key to someone else

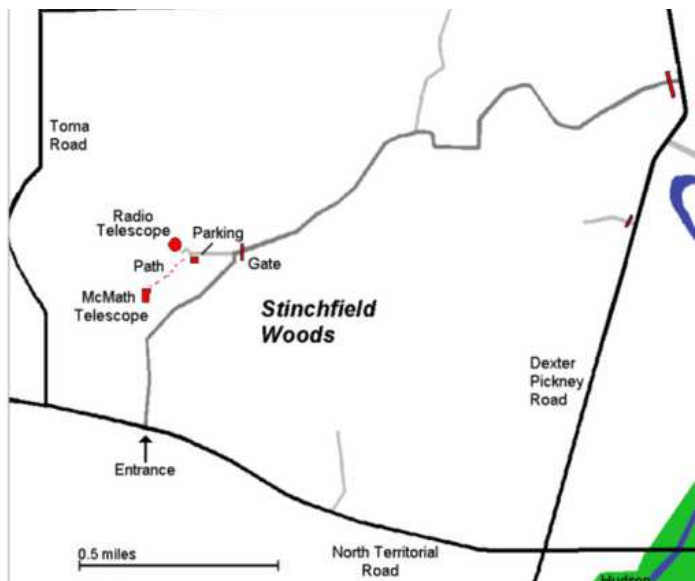
TODO:

- Jim Forrester - Email Tutorial
- Krishna - how to post events to Charlie
- Adrian or Steve - web site for viewing spots
- Jeff - check out wordpress, and Web services
- Krishna - check out squarespace
- Jeff - Ask JimZ about domain uptime monitoring (IFTTT?)

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, \$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

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:	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



University Lowbrow Astronomers



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STAMP