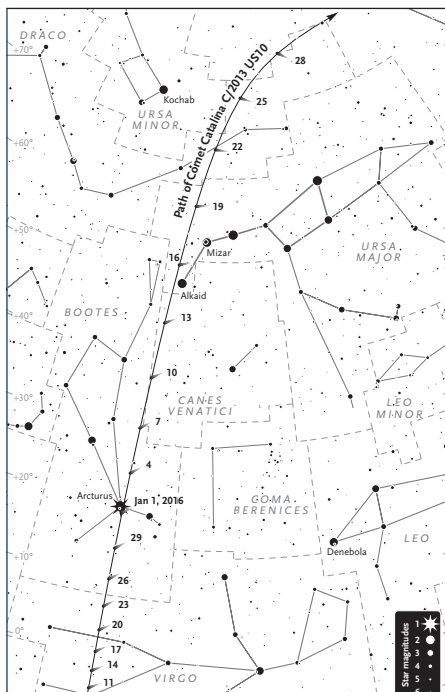




Christmas Morning Comet

C/2013 US 10 (Catalina)



Brian Ottum photographed C/2013 US 10 (Catalina) on the morning of December 6th from his remote controlled observatory in south-western New Mexico. "It was clear in the desert this morning, so I was able to get 10 minutes' worth of exposures of the comet with 2 tails." 10" f/5 scope, Canon 5DmkIII.

Originally expected to approach naked eye visibility, C/2013 US 10 has held steady at magnitude six since November. The closest approach to earth occurs January 12, so it yet may increase in brightness. The comet, whose path is steeply inclined to the ecliptic, is expected to hurtle out of the solar system, so the next few months will be everyone's last chance to observe C/2013 US 10.

The comet will become an evening object later in January as it passes through Draco and Camelopardalis east of Polaris. And if the long range weather forecast holds up, skies in Ann Arbor will be clear and the comet will be observable at 30 degrees altitude by 05:00 Christmas morning.

Right: Sky and Telescope provided this chart of the comet's path.

New Digital Setting Circles for the McMath Telescope

By Jim Forrester

The currently installed friction driven encoders have not provided reliable positioning information to the McMath Telescope's Argo Navis targeting computer for at least the last two years. This past summer and fall, John Manney and Observatory Director Jack Brisbin recorded positioning errors over several observing sessions that measured in degrees and found they could not return to objects later in the evening they had found earlier. Replacing the "O" rings on the encoders had no effect and the new rubber quickly deteriorated.

John and Jack reached out to other members of the Observatory Committee for ideas and after several discussions with members Dave Jorgensen, Don Fohey and Jim Forrester three conclusions were reached: 1) New direct drive optical encoders should be purchased and mounted to the ends of the Right Ascension and Declination shafts. 2) The firmware on the Argo Navis targeting computer should be upgraded to include the ability to remember and accommodate mount error. 3) Sky-Fi and Sky BT adapters should be installed to allow operation of the scope by those members with Sky Safari installed on their phones or tablets.

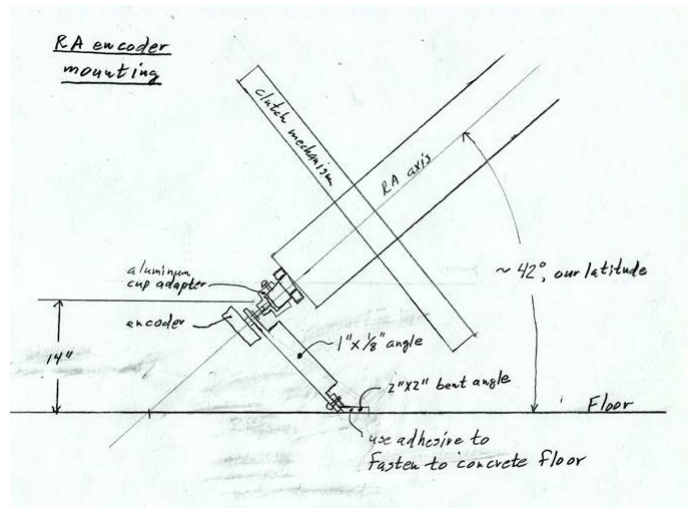
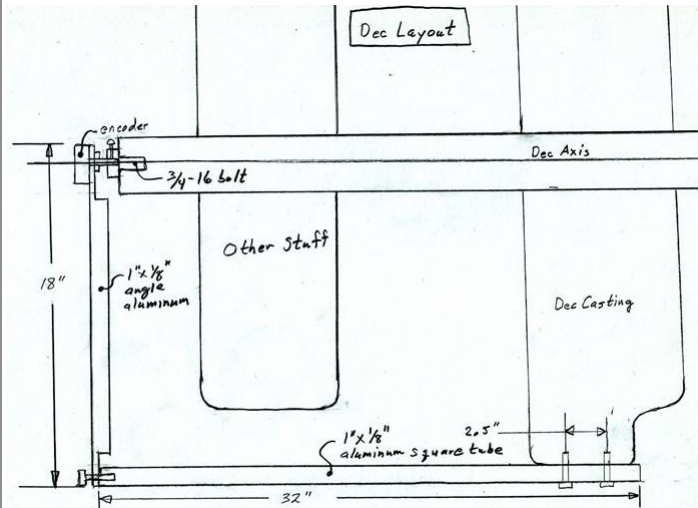
The direct drive encoders are the only such improvement that doesn't require disassembly of the massive almost 80 year old mount, something none of us thought practical (or likely possible). The club's 17.5 inch Dobsonian sports 10,000 tic units and mounting a set of those should provide the +/- 10 arc minute accuracy necessary to drop an object into the 23 minute field of view of the McMath's longest focal length eyepiece. But when we went to the supplier for the encoders, we found 32,000 tic units added to their catalog. This is the absolute limit of what the Argo Navis will support, so choosing the more accurate (and somewhat more expensive) encoders is not quite the no brainer one might think. We're still pondering the choice.

Updating the Argo Navis is complicated by the age of the club's unit. A 2006 model, it requires a computer (serial) port equipped computer and cable. Jack Brisbin happens to have an older PC laptop collecting dust that should do the job. The manual for the Argo Navis has been added to the club's web site in the members only section and you're all encouraged to take a look to be able to add your insights on how we might proceed and also get some of the knowledge you'll need to take advantage of these up-grades.

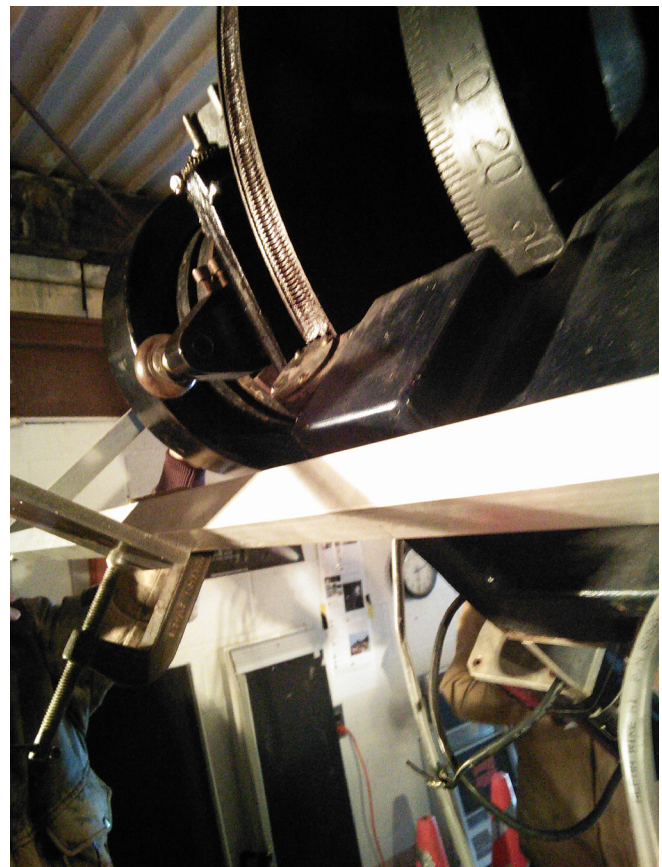
Several of the members have installed wi-fi or Bluetooth units to broadcast the encoder information from their telescopes to their tablets and cell phones running planetarium programs. Since some platforms support wi-fi and not Bluetooth, we believe installing a unit of each type necessary, and that since Sky Safari is by far the most popular software used by Lowbrows in the field, that the SkyFi and Sky BT units should be purchased for this purpose. With available free software, members using other programs can make use of the signals from these units.

The cost of encoders, new cabling (if needed), the wireless units and miscellaneous hardware runs

very close to \$500. Selection of the 32,000 tic encoders adds \$60 to the total, so at the December 18 Monthly Meeting, the Club voted \$600 for this project.

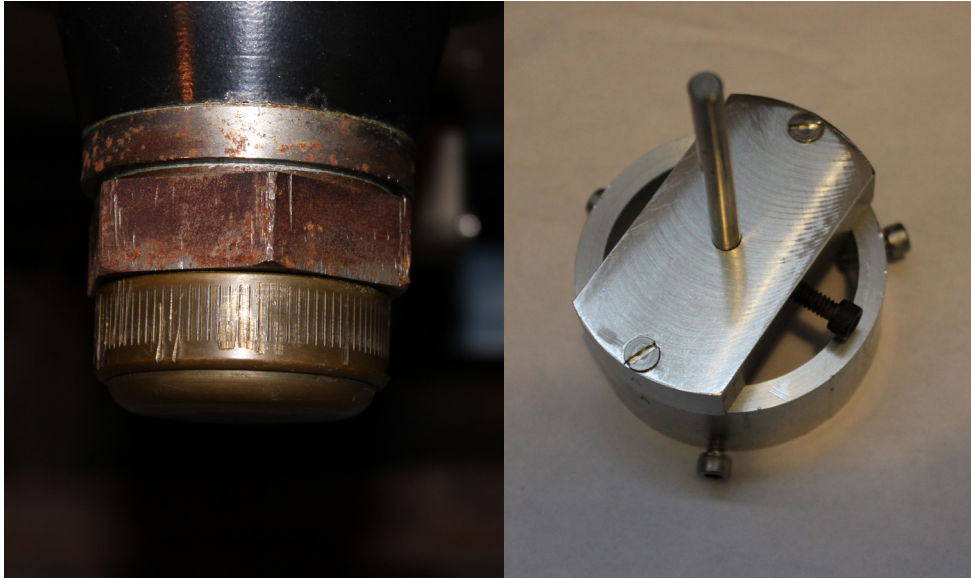


Rough sketches of the supporting structures for the new encoders: Left--Declination Right--Right Ascension Drawings: Dave Jorgensen
 The Declination structure must lie below the path of the roll off roof. We believe 1"x 1/2" x 1/8" rectangular aluminium tubing will be sufficient to firmly secure the encoder reaction arm. The Right Ascension reaction arm will be secured to a length of angle iron, bent to the proper angle, cemented to the floor with epoxy. We've experimented successfully with this technique.



Two views of a mock-up mount for the Declination reaction arm. The left photo shows the structure in relation to the end of the Declination shaft. Pictured: (from the left) Don Fohey, Dave Jorgensen and Observatory Director Jack Brisbin. The right photo shows where the support for the Declination axis reaction arm will bolt to the telescope mount. The end of the Declination shaft is drilled and tapped. A bolt threaded into the hole and center drilled with a set screw will anchor the encoder shaft.

Photos: Jim Forrester



The end of the Right Ascension shaft is covered with a brass cap (left). Attempts to remove the cap began damaging the cap with no positive result. Dave Jorgensen fashioned a cap for the cap (right) to attach the drive shaft of the encoder. The three set screws on the ring allow for centering. The entire assembly fits over the brass cap as shown below.

Photos: Dave Jorgensen



Lowbrow Monthly Meeting--Fri, January 15, 2016, 7:30 PM--Room G115 Angell Hall, University of Michigan, 435 South State Street, Ann Arbor, Michigan--1) Pat Seitzer (Research Professor, University of Michigan Astronomy) and Mel Drumm (Director of the Ann Arbor Hands-On Museum): "The Fate of the Old Angell Hall Telescopes (a 10-inch refractor and a 15-inch reflector)." 2) Ken Bertin (Warren Astronomical Society): "Galileo Galilei, the giant whose shoulders both Newton and Einstein mentioned they stood upon."

Almost Heaven

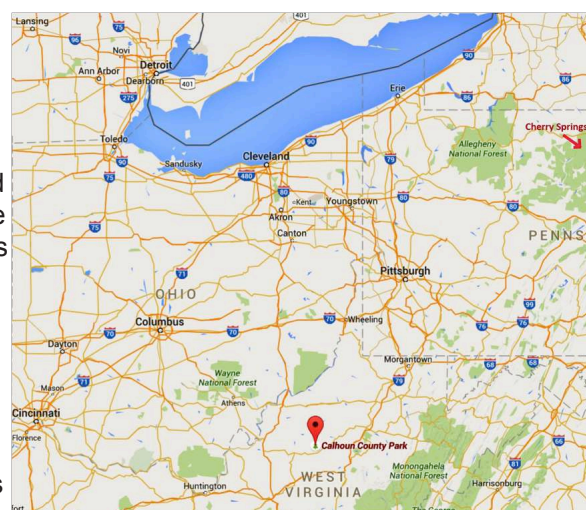
Revisiting West Virginia's Calhoun County Park

By Brian Ottum

Back in 2010 I visited Calhoun County Park, a wonderful observing spot 6 hours from Ann Arbor. (<http://www.umich.edu/~lowbrows/reflections/2010/ottum.7.html>) During November 13-15 I was fortunate to be able to return.

LOCATION

Calhoun County Park is located just NW of the center of WV, inside one of the poorest counties inside one of the poorest states. To get there, you take the boring Ohio turnpike to Akron, then turn south to I77. It gets quite scenic south of Canton – SW Ohio is surprisingly nice. Then you cross the Ohio River and pass by Parkersburg. Taking one of the first WV exits to highway 14, you are quickly enveloped in the curvy roads through the hills, hollows and humps of WV. There is no way to make quick progress, so enjoy the view. Keep both hands on the wheel, as these twisty ribbons of asphalt are narrow! You have just over an hour of 30-55mph driving until you get to the park. I cropped this map to include the location of Cherry Springs at the right edge (41 mins further drive).



THE PARK

Calhoun County park is a couple square miles of beautiful, flat-top hills (with thickly forested "hollers" in between). Kinda reminds me of the surface of the brain or brain coral. Used to be a golf course, so there are lots of great "fairways" on which to camp. The open areas make a three-leafed clover shape, so you can choose the area where you want to be. The most popular hill has power, water, a picnic shelter w/bbq, and a play structure. In the center is a barn which houses flush toilets, and one shower (men's shower currently broken), meeting room, a full commercial kitchen and a big open upstairs sleeping zone. You can rent the barn for some tiny amount under \$100/weekend. Bathrooms are accessible even if you do not rent the barn. Also, there are pit toilets.

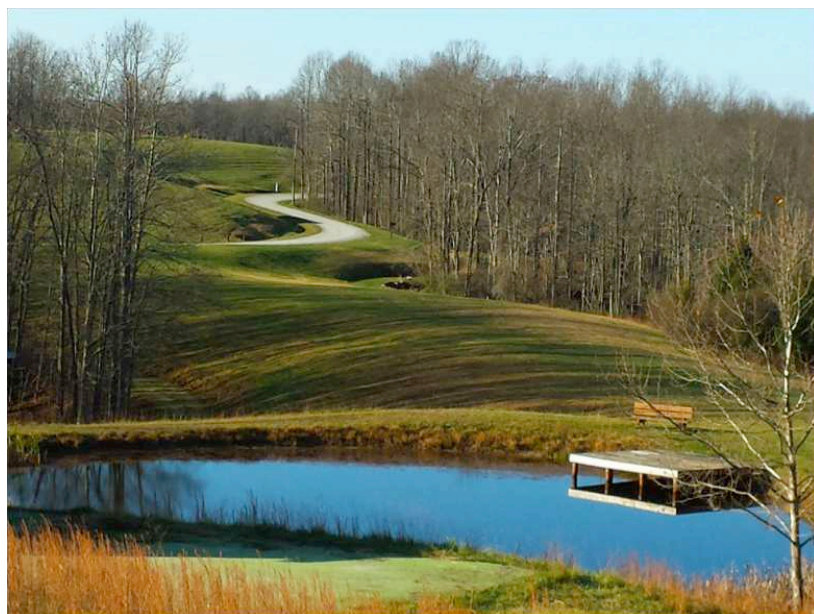
The hill behind the barn has campsites with water and electricity. Nice and high at the top. My favorite is the third hill, to the east, which has a scenic pond nearby. It is least susceptible to car lights, but does not have any power or water. Horizons are fantastic in all three hills.

There is a 3 mile hiking trail that surrounds the park. A cool part of the park is a historic village zone, where they have relocated 150 year old buildings to create a little ghost town.

An astronomer from Pittsburgh has put together a great website for the park:

<http://www.stellar-journeys.org/calhounpark.htm>

Looking west toward the entrance road.
Photos: Brian Ottum



ANIMALS

Tons and tons of deer! I had fun silently walking and disturbing their sleep. Also fun to turn on the headlamp and slowly walk toward pairs of eyes. I also saw bear scat, and the locals confirmed the occasional sightings. The dumpster showed evidence of a bear attempting to gain entry (he made a heckuva mess earlier this year). But the bear is shy and wary, and has never bothered anyone.

THE SKIES

This place is every bit as dark as the darkest parts of northern Michigan (for example, Atlanta). There is a small and unobtrusive light dome to the NNE (small nearby town of Grantsville). There is a slightly irritating but luckily small light dome to the SW. Small horizon glow to east. Straight south looks fantastic. Andromeda, M33 and the North American nebula are easy to the naked eye. Milky Way is glorious.

**OBSERVING REPORT**

Since I only brought my camera stuff, I poached other people's views. Larry from Pittsburgh has a magnificent video astronomy rig, and showed me NGC 891 on the screen. The uneven dust lane was obvious!

Dave from Wheeling let me use his nice 4" APO refractor for an evening. Again, I saw NGC 891 and the dust lane (almost as good as in Mike R.'s 14.5" Starmaster from Peach). Andromeda, M 33, M 42 and M 78 were great. So were all the open clusters in Auriga and Cassiopeia. The highlight for me was watching the orange and squashed crescent moon slowly set behind the trees of a distant hill.

THE WEATHER

Looking down from the top of the east ridge observing spot.

Compared to Ann Arbor, this place has average night time temperatures that are just a few degrees above (except for winter, where AA is much colder). The key difference is that daytime temps warm up more than they do in AA. Importantly, spring comes to WVa a month earlier, and winter a month later. Summers are hot and humid. So the obvious time to visit CCP is early spring or late fall, when northern Michigan observing spots are frosty.

NEARBY

Grantsville is just a few miles away, with grocery stores and a few restaurants. The Little Kanawa River and its tributaries look nice for kayaking. Biking down the steep valleys takes you back in time, to very humble creekside dwellings.

THE PEOPLE

The best part about CCP is the people who lovingly care for the park. Shirley, Roger, John and Jimmy are the most generous, helpful and nicest humans on the planet. For example, when I overslept Sunday breakfast, Shirley handed me a package of homemade chocolate chip banana bread for my drive home! They will do whatever they can to make your visit a success.

OTHER ASTRONOMERS

The word about this hidden gem is slowly getting out. Dark weekends in spring/summer/fall will usually have one or two other amateurs doing either visual or photographic. Most come from OH or SE PA.

THE FUTURE

CCP is trying to increase its profile, and put in improved bathrooms/showers/electricity. But a lack of resources makes progress slow. However, this should not be a deterrent to our visiting. I've got my eye on the April 8-10 weekend, next spring.

COMPARING OBSERVING SITES

Below is a table with a lot of detailed information comparing CCP to its obvious rival, Cherry Springs State Park in PA, along with Port Crescent SP at the tip of the Thumb, and Tomahawk in northern MI. Caveat: these are my opinions only and there may be factual errors in this table.

	Port Crescent S.P. MI	Tomahawk Flooding near Atlanta, MI	Calhoun County Park, WVa	Cherry Springs S.P., PA
Lat, Long	44.000, -83.070	45.230, -84.168	38.869, -81.097	41.661, -77.823
Elevation	574'	1200'	800'	2240'
Darkness	Very Good, but horizon glow all around except North	Excellent, but some small light domes	Excellent, but some small light domes	Excellent, very minor light domes
Miles from AA	147	224	378	414
Drive time (Google Maps)	2hr 39min	3hr 41min	6hr 8min	6hr 49min
Driving notes	Good roads all the way	Good roads all the way	Last 1 hr is very curvy scenic back roads	Last 1-2 hrs is back roads
April Average High/Low Temp	54/33	52/31	66/37	55/32
April Avg Cloudiness (all day)	65%	65%	60%	65%
April Notes	Possible cold wind off lake	Snow still a possibility	Spring comes earlier	Similar to AA
July Average High/Low Temp	81/60	80/55	85/63	77/54
July Average Cloudiness	55%	55%	60%	55%
July Notes	Nice	Very nice	Hot and humid	Very nice
November Average High/Low Temp	46/31	42/27	56/31	45/29
November Avg Cloudiness	75%	85%	65%	75%
November Notes	Possible cold wind off lake	Snow a possibility	Warms a lot during day, best chance of clear	Snow a possibility
Camp at your Telescope?	Not at parking lot, yes at forested campsites	Yes	Yes	Yes
Horizons?	Very good at parking lot, poor at campsites	Very good, if you pick right campsite	Excellent	Excellent
Bathrooms?	Pit at parking, nice flush at CG	Pit	Flush at barn	Flush
Showers?	Nice ones at CG	No	At barn (1)	No
Food?	Several restaurants within 8 miles	17mi to Atlanta	Kitchen in barn, 5miles to Grantsville	11mi to Sweden Valley
Daytime Activities?	Beach right there, kayak Turnip Rock, trails, tourism	Canoe & Kayak nearby, trails	Canoe & Kayak nearby, trails	Grand Canyon of PA, ice cave, trails
Light disturbance from the public	Yokels with brights swinging into parking lot, usual CG traffic	Not bad, depending on where you set up	Occasional yokels with headlights, minimized by setting up on east ridge	Getting worse as it gets popular
Other astronomers?	Occasional	No	Handful	Definitely
STAR PARTY?	None, and beware of "Cheeseburger in Caseville" for 10 days in August	None	None	Great ones in early June and early Sept
BRIAN'S ASSESSMENT	Nice spot for 1 or 2 night trip, but having to take down is a negative. Great for aurora viewing. But can get to darker in 1 more hour of driving. Lots to do. Great place for weekday summer trip (weekends fill up)	Best option for May, July, Aug, Sep. (June and early July very short nights.). Great for 2-night trip.	Good option for early spring and late fall due to warmer temps, clearer. But long drive. So only go when forecast is good, staying for 3-4 nights.	Good option for July, Aug (if you want solitude), or the star parties. But long drive. So only go when forecast is good, staying for 3-4 nights.

Another Evening with Brother Guy

By Jason Maguran and Charlie Nielsen

As many of you know, we had a fine event with Brother Guy Consolmagno on Friday November 20, 2015. Everything worked without a glitch or malfunction. We drew about 175 people and from as far away as Holly, MI and Windsor, ON (RASC members). Brother Guy was great as usual and he spent over an hour and a half with us speaking on the topic of Vesta and the Chaotic Formation of Planets. After that, a group of us went to get a short demo of the EMU planetarium, which was the first time that Brother Guy had seen it. We finished the evening by going to eat at the Tower Inn Café. It was a long but great evening! Special thanks go to Norbert Vance for securing our room, the free parking, the signs, and Tower Inn.



Brother Guy's talk on Vesta and the Chaotic Formation of Planets was as much a lesson in geology as it was a lesson in astronomy. Here are some of the highlights of his talk:

- Vesta could hold the key to the origin of our solar system, as Vesta is the only asteroid that is still intact, and wasn't pulverized by other planets or asteroids.
- Condensation, temperature, and parent body control the composition of meteorites.
- The elemental ratios are very different in the howardite, eucrite, and diogenite basaltic meteorites (HEDs) versus "ordinary" meteorites.
- The amount of aluminum in the crust is an indicator as to the thickness of the crust.
- The thickness of the crust of Vesta tells us how far Jupiter moved from its current orbit.
- The olivine mantle of Vesta has remained intact. This is shown by the fact that we have not found any olivine meteorites.
- The DAWN spacecraft visited Vesta to verify our assumptions. Some of them were correct, but some were not.

Here are the possible conclusions that have been made based on what we know and the discoveries made by the DAWN spacecraft:

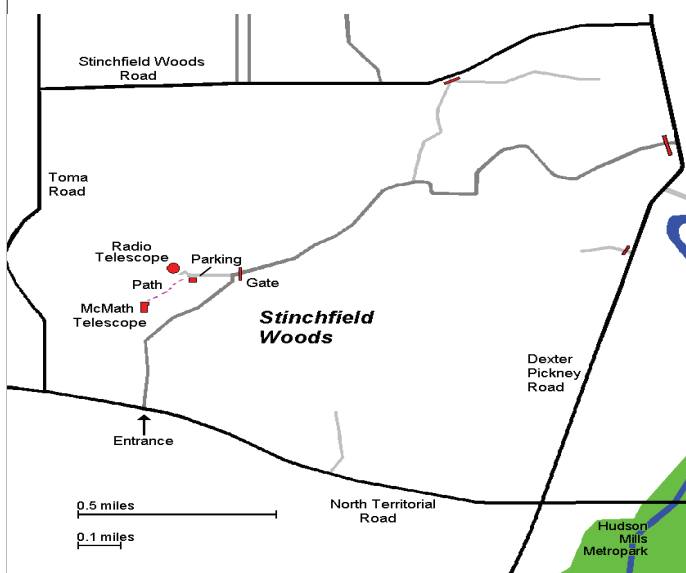
- Vesta is covered in a great thickness of HEDs.
- But Vesta (today) is not a chondritic body that differentiated to make the HEDs.
- Its crust is too thin to hide the olivine.
- Its core is too big to allow an olivine rich mantle.
- Yet the HEDs did come from a differentiated body, probably not too far from chondritic, but lacking in sodium and enriched in iron oxide.

Brother Guy intends to speak in the area at least every two years, but he'll be back sooner: next April 15!

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 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. A club observing session at the Peach Mountain Observatory, weather permitting, often follows the meeting.

Peach Mountain Observatory is the home of the University of Michigan's 25 meter radio telescope as well as the University's McMath 24" telescope, maintained and operated by the Lowbrows. Located northwest of Dexter, MI; the entrance is off North Territorial Road, 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 Mountain observatory, but are usually cancelled if the sky is cloudy at sunset or the temperature is below 10 degrees F. For the most up to date info on the Open House / Star Party status call: (734)332-9132. Many members bring their telescope to share with the public and visitors are welcome to do the same. Peach Mountain is home to millions of hungry mosquitoes, so apply bug repellent, and it can get rather cold at night, please dress accordingly.

Membership

Membership dues in the University Lowbrow Astronomers are \$30 per year for individuals or families, \$20 per year for students and seniors (age 55+) and \$5 if you live outside of the Lower Peninsula of Michigan.

This entitles you to the access to our monthly Newsletters on-line at our website and use of the 24" McMath telescope (after some training).

A hard copy of the Newsletter can be obtained with an additional \$18 annual fee to cover printing and postage. Dues can be paid at the monthly meetings or by check made out to University Lowbrow Astronomers and mailed to:

**The University Lowbrow Astronomers
P.O. 131446
Ann Arbor, MI 48113**

Membership in the Lowbrows can also get you a discount on these magazine subscriptions:

Sky & Telescope - \$32.95 / year \$62.95/2 years

Astronomy - \$34.00 / year or \$60.00 for 2 years

For more information contact the club Treasurer at:

lowbrowdoug@gmail.com

Newsletter Contributions

Members and (non-members) are encouraged to write about any astronomy related topic of interest.

Call or Email the Newsletter Editor: **Jim Forrester (734) 663-1638 or jim_forrester@hotmail.com** to discuss length and 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 Presidents: Dave Snyder (734) 747-6537
- Dave Jorgenson
- Don Fohey
- Ken Ruble
- Treasurer: Doug Scobel (734)277-7908
- Observatory Director: Jack Brisbin
- Newsletter Editor: Jim Forrester (734) 663-1638
- Key-holders: Jim Forrester (734) 663-1638
- Fred Schebor (734) 426-2363
- Charlie Nielsen (734) 747-6585
- Webmaster: Krishna Rao

Lowbrow's Home Page

<http://www.umich.edu/~lowbrows/>

Email at:

Lowbrow-members@umich.edu





University Lowbrow Astronomers

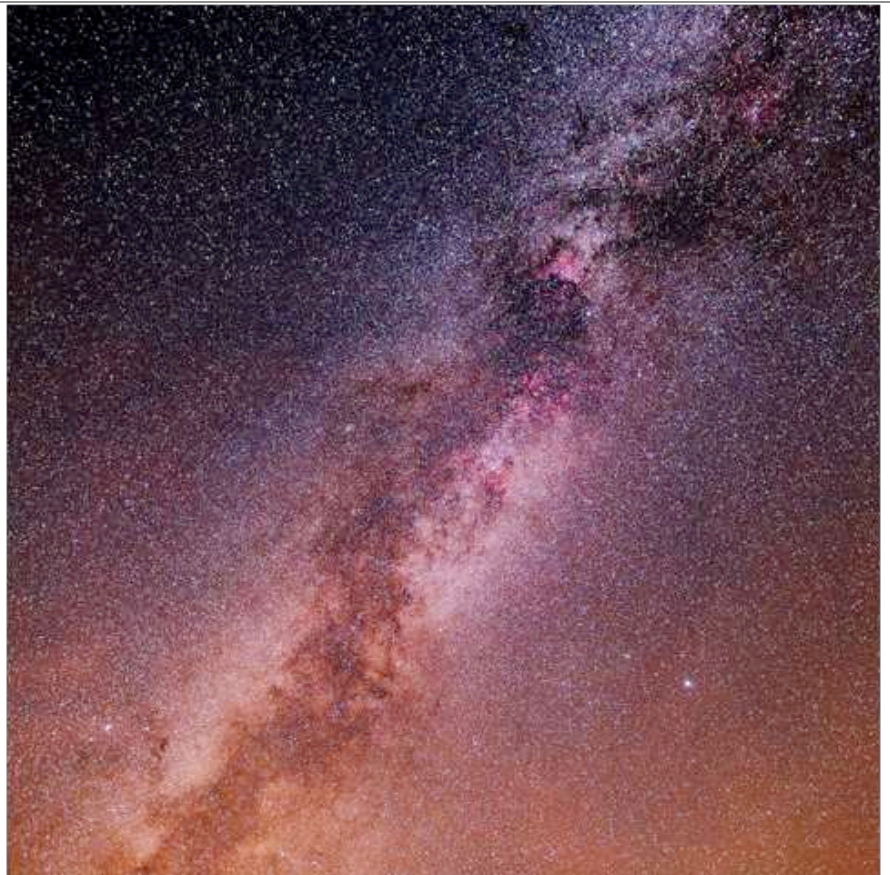
University Lowbrow Astronomers
P.O. Box 131446
Ann Arbor, MI 48113
lowbrowdoug@gmail.com

Reflections & Refractions



Website

www.umich.edu/~lowbrows/



A single 60 second shot showing the brightness of the summer Milky Way from Calhoun County Park. Canon 6D, 24mm f/1.4. Cygnus and Aquila, featuring the pink North American Nebula.

Photo: Brian Ottum



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Ann Arbor, MI 48113