

REFLECTIONS / REFRACTIONS

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University Lowbrow
Astronomers

OCTOBER 2015

VOLUME 39, ISSUE 9

September 25 & 26

Astronomy At The Beach

By Paul Walkowski



"Camp Lowbrow" at last year's event at Kensington Metro Park. Foreground right, Buddha-like in a monk-orange t-shirt, sits our smiling author. Scattered across the background are some of the Usual Lowbrow Suspects. Attend this year's event and you too can become a Lowbrow "Usual Suspect."

Photos: Doug Scobel

Astronomy At The Beach, as the Premier SE Michigan star party, will have a host of activities including nearly 100 amateur telescopes focused on the delights of a September evening's sky so the participating youth and their families can undergo the astronomical scavenger hunt. This is not only an opportunity to be part of something big, but a chance to rub elbows with amateurs from as far away as Michigan's thumb to Ohio, from Lakes St. Clare and Erie to Jackson and Lansing. Even if I exaggerate a bit, it's better to aim high and come up a tad short, than to sit on the couch and go nowhere at all. The point being, we need you and your telescope to keep the waiting lines reasonable and the event fun for all. Even if you feel like the biggest novice or newbie on the planet, most of our visitors will never have looked through a telescope before and their memory of looking through your scope and talking to you could be paradigm changing. Your enthusiasm and a brief glimpse at the rings of Saturn or the Moon's craters could make the difference between a youth being open to a career in science and technology and one who dismisses science as being "just for those geeky folks". Your 3-5 minutes invested could provide that tiny nudge that sent them on an entirely different orbit, and achieving all sorts of discoveries years down the road.

For the uninitiated, we bring our telescopes to Kensington Metro Park's Maple Beach on Friday Sept. 25 and Saturday Sept. 26, 2015 from 6 PM until midnight. The rest of the "we" are the Ford, Warren, Seven Ponds, EMU, Oakland and Sunset clubs with a big

Total Lunar Eclipse: Sunday, September 27

See Page 8

salute to the Michigan Science Center which is spending a bundle on overtime for 4 employees to equip and provide technical support for the main tent and the portable planetarium.

Maple beach is most quickly reached by entering the Kensington Road entrance to the park off of I-96. Unfortunately attending astronomers will need to pay a daily or yearly park admission to participate, as has always been the case. The two things to remember are that because the public event starts at 6 PM, its best to arrive a half hour early and drop off your Equipment at "Camp Lowbrow"



Your editor explains to a most enthusiastic young astronomer the safety precautions and optics of solar observing through a telescope.

where others can watch it for you as you park your car. Yellow balloons will be provided in the pavilions for identification of astronomers with solar scopes, but remember to bring your balloon again on Saturday. Cars are not permitted back on site until after 11:30 or 12 AM when the crowds dwindle to "just us astronomers". We can linger longer, as the park's gates are open until 2 AM. The danger of being locked in the park is vanishingly small, though, as the "gates" themselves are brightly painted sawhorses that can be moved or driven around. And of course park rangers do need to get home to their families too!

the pavilion, the talks will take place in a large tent with its back to the setting sun, and the MSC inflatable planetarium will be nestled under an overhang, behind the pavilion to keep it out of the wind. There will be hot dogs grilled on site, along with chips and pop for a fee. This year there should be a tarp to keep direct light from the vendor's truck from spilling over into the observing field, similar to what is used to control the light from the pavilion. GLAAC plans to provide an astronomers' coffee pot in the pavilion, but if you have particulars about the coffee you drink, it is wise make other plans. My recommendation is to BYO dinner and thermos or pop, rather than subject yourselves to the hot dogs, cola, or nothing selection from the vending truck. The stairs to the pavilion are a trip hazard and will be blocked off with barrels and caution tape from above and below. Bicycle paths will be marked with signs at both ends of the event area instructing cyclists to dismount and walk their bikes through the crowd.

The facilities consist of a ½ mile of grassy lawn between the 1950's vintage bathhouse (which serves as a pavilion for clubs handing out literature) and the sandy beach, cut neatly along its length by a paved bicycle path. Car entry and exit is restricted to the cement driveway that approaches the pavilion on its right and dog-legs to the right onto the bicycle path. Driving on the grass runs the risk of damaging a sprinkler head and hosing down our guests. The layout will be the same as for the last 2 years: an information booth will be in the driveway just before

A series of 20 minute min. talks and demonstrations will run fro 6-9 PM with the keynote speaker, Dr. Nicolle Zellner, Assistant Professor of Physics as Albion College addressing the event from 9 to 9:45 PM. Dr. Zellner, will speak on "Why we Have a Moon". Dr Zellner is a lunar/planetary scientist associated with NASA's Astro-biology Institute, at the Lawrence/ Livermore Laboratory's Institute of Geophysics and Planetary Physics, and the New York Center for Studies on the Origin of Life. She is a member of the American Astronomical Society's Committee on the Status of Women in Astronomy. She received her PhD from RPI and did her undergraduate work at University Wisconsin- Madison.

The Sky Tour scavenger hunt starts as soon as telescopes are set up as the sun (bring solar filters), the nearly full moon (in Aquarius), and Saturn (setting below Ophiuchus) will be visible before dark. Instructor led tours of the constellations will run every 30 minutes from 10-11:30 PM. There will be at least 2 eyepiece projection televisions available, one targeting Pluto and another on deep sky objects so even handicapped youth who cannot get near an eyepiece can look through a telescope.

For the Sky Tour Scavenger Hunt I'd recommend putting one's telescope on the same bright object for 45 minutes and then changing to another. Please bring a pen to initial next to an object's name when youngster looks through your scope. George will be handing out Sky Tour sheets in the pavilion, and I will be handing out them out on the beach during the event. The sky tour consists of seeing the moon, a planet, a star (preferred colored stars, the sun, or binaries to peak interest), a galaxy, a nebula, and a star cluster. We are trying to obtain inexpensive red flashlights (that cannot be swallowed) for those who complete the tour.



Dr. Nicolle Zellner
Photo courtesy Albion College

Next year's AATB will be Sept 23-24 at Maple Beach in Kensington. There is always the question of the Kensington beach facilities being available in future years, but some work has been done to provide an alternate location at Spring Mill Pond (part of the Island Lake Recreation Area) across I-96 if the Maple beach house is torn down for renovation. Apparently the lease on a gravel pit adjacent to the Spring Mill Pond facilities has expired and plans are already laid in place to level the area for additional park roads and parking lots. While rest rooms are available, a second tent would need to be rented to replace the pavilion.

Treasurer Doug Says:

Time to Order Your RASC Publications

By Treasurer Doug Scobel

2016 is still a ways off, but it's already time to order your 2016 RASC Observer's Calendar and Observer's Handbook! These publications from the Royal Astronomical Society of Canada (RASC) are unique, eminently useful, and second to none! You now have the opportunity to order these publications through the club treasurer (that would be me) at a substantial discount. Here are your Lowbrow discounted prices* compared against those when ordering directly from the RASC (all in U.S. Dollars). Prices are unchanged from last year:

	Observer's Calendar	Observer's Handbook
Single copy from RASC:	\$28.95	\$38.95
Lowbrow price (score!):	\$20.00	\$27.00

As you can see the savings are significant!

Here's the fine print. In a departure from previous years, **I WILL REQUIRE THAT YOU PAY IN FULL FOR YOUR ITEMS BEFORE I ORDER THEM FROM RASC.** More and more in recent years a few folks have been slow to pay or even in some cases have failed to pay. Then I have to beg to receive payment or scramble to find a new purchaser for un-paid-for items. For this reason I will require payment from you up front. No money, no handbook, no calendar, no exceptions! This is why you're reading this notice about a month early compared to past years - to give you more time to get your payment to me.

If you wish to get in on the deal, then **ENSURE THAT YOUR PAYMENT GETS TO ME NO LATER THAN OCTOBER 16** (the date of October's regular monthly meeting). This will allow me time to place the order and for the items to arrive in time for me to distribute starting with the November 20 meeting. Besides your payment, I'll need to know which publication(s) you want, and how many of each. Again, prices are \$20.00 per calendar and \$27.00 per handbook. As with dues, you can pay via cash or check, in person or through the U.S. mail, or via PayPal. If you pay by check then please make it payable to "University Lowbrow Astronomers". If you mail your payment then send it to:

University Lowbrow Astronomers
P.O. Box 131446
Ann Arbor, MI 48113-1446

If you pay by PayPal then send your payment to lowbrowdoug@gmail.com. Be sure to mark it "To family or friends".

*Note that the prices I quote above are \$3.00 extra per copy above the RASC's discounted price to us, to provide the club a modest profit to help pay for club expenses. So the more you purchase the more you help the club. Please think about buying extras for Holiday and/or birthday gifts, or you may even want to sell them where you work. RASC offers an additional discount for quantities over 25, so **ORDER EXTRAS FOR FRIENDS, FAMILY, CO-WORKERS, NEIGHBORS, STRANGERS ON THE STREET** (okay, maybe not). You get the idea.

You can get previews of these outstanding publications (the 2015 versions) by clicking on the following links. (Do not order through these links, unless you don't mind paying substantially more!) I will update you when previews of the 2016 versions are available.

<http://www.rasc.ca/observers-handbook>

<http://www.rasc.ca/observers-calendar>

Please note that as usual, I will distribute these publications at the regular Lowbrow meetings, starting in November. If you live out of state or have trouble getting to meetings then I can ship your items to you, but you will have to pay for shipping and packaging costs. Shipping typically runs from around \$5.00 to \$10.00 or more, depending on how many items you order.

Remember, the deadline for me to receive your payment is October 16, 2015. So don't procrastinate! Get your payment to me now!

Paul's Summer Observing Sojourn...

...Continued from August

By Paul Walkowski

July 10: The family was at a band concert so I got off to a late start on Thursday night, but it was clear and I couldn't let the opportunity slip by. Both Jupiter and Venus were clearly visible setting above the trees and Saturn popped out moments later. I plopped the pipe fitter's end table down and it kind of stuck right there in the soft ground. I shook it by hand, and it just sat there-- so far so good. So I knelt on it, sat on it, and bounced up and down a few times on it. It had finally won enough trust for me to put my scope on it. I checked its solidity with Jupiter in the EP and it repeatedly passed the bonk test up to 6 g's. By then the planet was in the trees so I went on to Saturn.

The views were a little unstable because the mirror had not cooled off. The strongest EP Saturn would support was an 11mm. I worked on my observing plans and enjoyed the azure colored western sky. I started observing the open clusters between Scorpius and Sagittarius and went on to the globular clusters. Pinpoint sharp, white on black, snapping into focus, does it get better than this? I swatted and killed two mosquitos and the rest of them took note and left Dodge for the rest of the evening. The 24mm panoptic was such a pleasure to use with its wide field of view. Finding clusters was like shooting fish in a barrel. It was so easy that I had to keep reminding myself to stick around and look at each cluster; this was "observing" not a breathless Easter egg hunt and on to the next one.

The point is the weather and sky were perfect, the optics and mechanics were perfect, the new scope was ergonomic, and I was having a great time. The best time observing in perhaps 3 years. I alternated between the 24 mm Pan and the 15mm Explore scientific 68 degree EP that I recently acquired. The black background on the Pan was better for finding things but the ES gave excellent crisp closer-on views without trimming off the outer fringe stars. I stumbled upon a beautiful little S-shaped grouping of globular clusters at the far south end of Ophiuchus that includes M-19 and M-62. It sits a few degrees West of the midway point between Antares and the spout of the (Sgr) teapot. I easily spotted 5 of the 7 clusters on the charts and they were only 15 degrees above the horizon.

My watch beeped and it was midnight so I took a sky darkness reading of 21.4 "visual magnitudes per square arc second" at the zenith using John's Sky Quality Meter (see www.unihedron.com). John later noted that he has gotten similar readings at Peach Mt on clear nights.

By this time most of the cottages around the lake were completely dark. I took a bunch more readings at different angles but only when I pointed it at a boat landing with a vapor light on a pole several miles up the lake did the reading drop to 20.1. Yea, don't say it, I know, engineers are like that-- loan 'em a gauge and they waste their evening doing a gauge R&R.

The Milky Way was blatantly visible in the center 1/3 of the sky, I could read star charts by it and it cast a shadow beneath my scope. This wasn't as dramatic as at the Black Forest star party where the Milky Way was visible from horizon to horizon like a bank of fluorescent lights, a true breathtaking lifetime experience, but I'm not complaining. I could not find Vulpecula in the dense tangle of stars overhead. All the stars seemed too bright and too close together. I was fearful of losing my night vision if I kept looking for it.

Then I started with the Ptolemy's cluster (M-7), the Butterfly M-6, the Lagoon nebula M-8, and raced up the spine of the



Minimal lumber makes a much lighter telescope. CNC cut parts makes for a tight and rigid fit. A Kydex oval opposite the focuser blocks stray light. Next page: Side view displays the open construction. Photos by the author

Milky Way all the way to Aquila looking at clusters.

There are clusters between named clusters, and boat loads of smaller clusters between those. It steals your breath away. And to suddenly have your full vision back after years of fade out and finally having cataract surgery is another blessing. It's like I had never seen so much detail previously or alternatively my memory is fading and I'm making lots of the same friends over and over. Ah, a sky full of unexplored stars--- the stuff dreams are made of. It makes me wonder what it's like observing from the ISS? Actually I asked Lake Orion native, astronaut Dr. Andrew Feustel about this and he said that the earth is so present and fascinating that nobody ever turns the Schmidt Cass in the ISS towards the stars.

It's now getting late and the lake on 3 sides of me is absolutely still. I gave a quick glance to the east and west but no Zodiacal light spike. While I was observing the Lagoon I tried a UHC filter with the 24 Pan and the 15 ES. The same amount of nebulosity was visible in the Pan with and without the filter, the view was just brighter and more contrasty without. With the ES the opposite was true, the filter improved the contrast. I never expected that, a tip of the hat to Al Nagler, an EP designed 25 years ago is still dusting the competition.



I decided I was losing my edge and I'd just look at a few more items and retire for the night. With the scope up on the table it took 10-15 seconds to center the great globular in Hercules. Big, bright and beautiful as ever. Next I tried for the Whirlpool, I have seen both the whirlpool and the pinwheel here in years past, but not tonight. I tried my battery operated turkey baster for secondary dew removal and it seemed to work fine but I was getting impatient and cold, it's back in the mid 40's again. I left it for another night when I would be farther from the tree on the NW edge of the observing site. The maple was barely 12 feet tall when I first observed here. The bowl of the Big Dipper rotated behind that maple making finding M-81 & M-82 difficult but the Andromeda galaxy was at least 45 degrees up over

the other side of the lake, an easy catch. M31's bright spot in the sky was naked eye visible.

You know how you keep pushing on, like driving when you are tired instead of stopping and walking around a bit? Well I was getting punch drunk or star-stupid or whatever its called and kept looking at just one more thing. I was looking for M-33 as a starting point for that cluster of galaxies including NGC 507 just to the north of it, and something was wrong: stars were streaks and large irregular globs. I peeked at my primary mirror with a flashlight and sure enough, it was dewed up. Time to call it a night. Oh look there is the moon rising like a searchlight on the opposite side of the lake. That explains the difficulty finding M-33. The moon probably illuminated atmospheric dust before it cleared the horizon, ruining the contrast.

After a day of hard rain the sky started to clear around 6 PM so I got out my observing plan, really just a list by constellation that I made using Sky Safari. So I set up the scope and while doing so a dense bank of clouds obliterated the southern half of the sky. I promised a young grandson a view of Saturn, sort of a returned favor for his not touching the scope all week while it sat prominently next to the front door on the only floor space in the cabin not taken up by something else. After a fashion the clouds parted to the NE and SW and Saturn popped through the hole in the middle, sort of like the Red Sea parting for the Hebrews. Apparently God honors promises made to small kids. So Alex and his mom came to the waterfront right around 10:30 and looked at Saturn saying words like neat and cool. Apparently the rain also brought out the mosquitoes, perhaps 40-50 per square meter, and after a few minutes my family went to sit in the car to recover from the torrent and lick their wounds.

I lathered up with Deet and pulled my hat down around my ears hoping for a good night of astronomy, but the mosquitoes were swarming without mercy. I thought that the bugs might keep the fireworks to a minimum and was right about

that one point, and only that point for the entire evening. I figured that I could get a nice open cluster in Cass or Aquilla for my grandson to see before he left, but the varmints kept getting under my glasses, in my ears, up my pant legs and even up my nose. Continuously. I put on more Deet because if something does not work, doing more of it will surely work. And then doused my clothes for good measure, pulling the hoodie over my head up to my glasses, while the bugs invited their distant relatives and organized their efforts into attack wings and squadrons. I found that if I continually swung one hand in front of my face I could look up at the sky and see stars, without getting carried off of course. But I could not bring the scope onto a star cluster in the Milky Way and it was still a bit bright for galaxies.

Enough! This is not Fun. I grabbed armfuls of star charts and flashlights and tossed them in the floor of the back seat quickly slamming the door again. I rearranged the trunk in one swift move, and possessed with adrenalin grabbed the entire scope and base, and pushed it into the newly vacated space. The Plumber's end table stood on its edge on top of everything and the trunk lid flew down. Swatting with one hand and digging bugs out of my eyes with the other, I got the driver's door open, slid inside, and slammed the door. Whew, once inside the car I was only outnumbered 1000 to 1, statistically a vast improvement, and politically speaking a moral victory. As I drove back to the cabin black clouds of mosquitoes swarmed in the headlights, yuck. This had to have been the worst observing experience of my life. It made me think about the plague of locusts. Well let's see; I guess I learned that there is more to a hobby than perseverance. There has to be an element of joy in there too. Maybe I learned how to cut bait.

The next night was quite windy and it must have blown the mosquitoes all the way to Quebec. Good riddance. I thought about setting up a refractor in the wind, but I had plenty of good views of Saturn already, and after using a bright 10" reflector all week I was too spoiled to go after just the brighter Messiers with a refractor. The next night was nearly calm and clear from horizon to horizon, but cool.

I looked up the Whirlpool galaxy, the pinwheel M-101, and the sunflower galaxy M-63. I could generally see the shape of the spiral arms of M-51 without any averted vision, and hints of more structure with averted vision. Lets say I looked in the right place for M-101 and I might have seen a small smudgy thing, but it was not a confirmed kill. M-63 was dimmer than M-51 but a shapeless blob to me. M-81 & 82 were nice and bright in the 10" scope, but the 24mm EP did not allow me to see both at once, one or the other was partially cut off. The night was getting more and more spectacular as it wore on. The Milky Way was doing that florescent light thing where it cast shadows under the telescopes and beneath observers. Andromeda was a blatant naked eye object by then and I compared the views in a 32mm Kellner, the 24 Panoptic and a 32 TV plossl. The Panoptic won by 3 lengths, it wasn't even close; the plossl shrank the view down to an uncomfortable pinhole, the Kellner was full of ghost images from internal reflections, and the Panoptic "disappeared" I was looking through a port hole into heaven, and there were colored stars in the mix. I took a sky reading and it was 21.42. I need to figure out what that gauge does because it was taking readings straight into the Milky Way at that point and the milky way seemed offensively bright.

I saved the great globular in Hercules for the end and it was awesome, well past the zenith, and tack sharp. I looked through the EP again to center on Hercules, one last glimpse before I would disassemble the scope and pack up the next day. The scope was dewed up again. The car thermometer said 42F in mid July, where IS that global warming? I checked both the primary and secondary mirrors with a flashlight and the secondary was still clear, the balsa mount must have protected it from the cold, while the primary was suspended at 6 points by an aluminum cell near the lower open end of the OTA surrounded by a thin Kydex tube. Hmm, could insulation be a better dew prevention device than a heater? Or would spending a few bucks on a car battery hair dryer end this problem once and for all?

To be continued ... next summer.

Paul's scope is a DobStuff kit that presented its own challenges during assembly. The minimalist design makes for a light scope, ideal for aging astronomers. Paul has promised a short slide presentation detailing construction for a future club meeting.--ed.



Close-up of the mirror box with the Kydex sleeve removed. Kydex replaces the usual wood walls of the box, lightning the scope dramatically.



DYLAN MA took these photos of a proton arc, a rarely seen phenomenon of the earth's aurora, August 16 at the Table Mountain Star Party in Washington State.

*Left: Nikon D610 24mm f/2.8, 30s at f/3.5 ISO 4000
Below: Nikon D90 8mm f/3.5, 56s at f/3.5 ISO 1600*

*SpaceWeather.com published several of Dylan's proton arc photos:
http://spaceweathergallery.com/indiv_upload.php?upload_id=116486*

"On the last night of the Table Mountain Star Party on Eden Valley Ranch in north-central Washington state, a bright glow appeared in the North.

This soon broke out into a display of red pillars above the luminous green clouds. Meanwhile, two beams of light grew from the East and from the West, slowly rising and brightening until they met, crossing the Milky Way as bright as a searchlight."



Lowbrow Calendar

Saturday September 5 and Saturday September 12--Open House on Peach Mountain--Begins at sunset, may be cancelled if cloudy.

Friday, September 18, 7:30 PM--Lowbrow Monthly Meeting--Room G115 Angell Hall, University of Michigan, 435 South State Street, Ann Arbor, Michigan--Doug Scobel and Don Fohey (University Lowbrow Astronomers): Black Forest Star Party Report.

Saturday, September 19, 8:00 PM--Observing at Leslie Science Center--1831 Traver Rd, Ann Arbor, MI 48105

Friday, September 25 and Saturday, September 26, 6:00 PM -- 12:AM--Astronomy At The Beach--Maple Beach, Kensington Metropolitan Park, Milford Township, Michigan. 50-100 telescopes. Speakers, observing and more. Michigan's largest annual astronomy event.

Sunday, September 27, 7:30 PM -- 10:30 PM--Lunar Eclipse Hike--County Farm Park, 2330 Platt Road, Ann Arbor, MI 48104. Public hike to enjoy the deep lunar eclipse. Hosted by Washtenaw County Parks and Recreation. (Lunar eclipse observing, see page 8.)

Saturday, October 10 and Saturday October 17--Open House on Peach Mountain--Begins at sunset, may be cancelled if cloudy.

Friday, October 16, 7:30 PM--Lowbrow Monthly Meeting--Room G115 Angell Hall, University of Michigan, 435 South State Street--Edward Cackett (Assistant Professor, Physics, Wayne State University). Topic to be announced.

Friday, October 23, 8pm – 11pm--Scio Farms Star Party--Scio Farms, 6655 Jackson Road, Ann Arbor, MI

Total Lunar Eclipse of 2015 Sep 28

Ecliptic Conjunction = 02:51:38.3 TD (= 02:50:29.0 UT)
 Greatest Eclipse = 02:48:16.8 TD (= 02:47:07.5 UT)

Penumbral Magnitude = 2.2296 P. Radius = 1.3027° Gamma = -0.3296
 Umbral Magnitude = 1.2764 U. Radius = 0.7707° Axis = 0.3375°

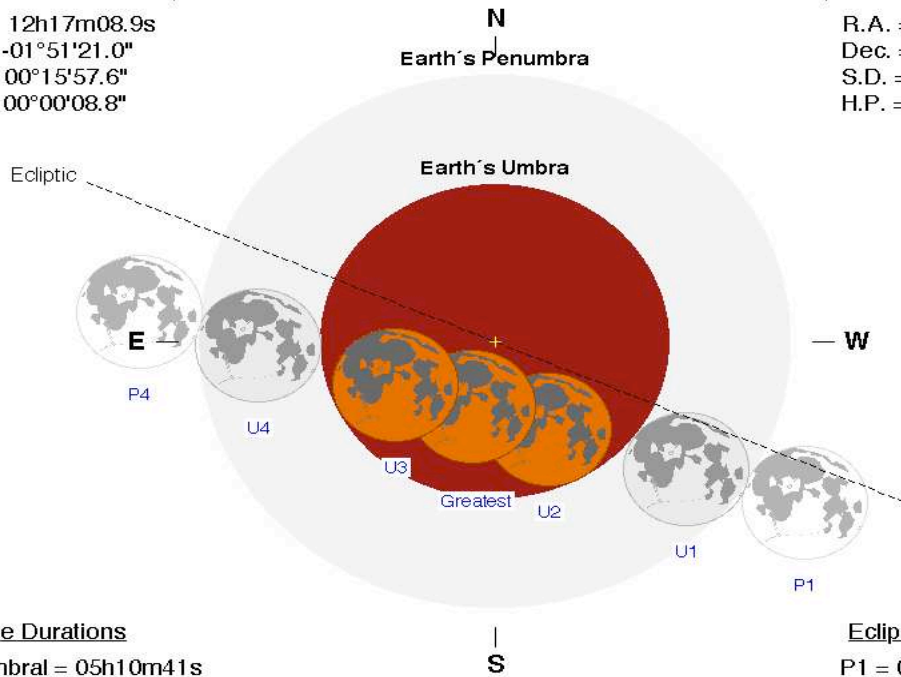
Saros Series = 137 Member = 28 of 81

Sun at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 12h17m08.9s
 Dec. = -01°51'21.0"
 S.D. = 00°15'57.6"
 H.P. = 00°00'08.8"

Moon at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 00h17m33.6s
 Dec. = +01°32'03.7"
 S.D. = 00°16'44.5"
 H.P. = 01°01'26.6"



Eclipse Durations

Penumbral = 05h10m41s
 Umbral = 03h19m52s
 Total = 01h11m55s

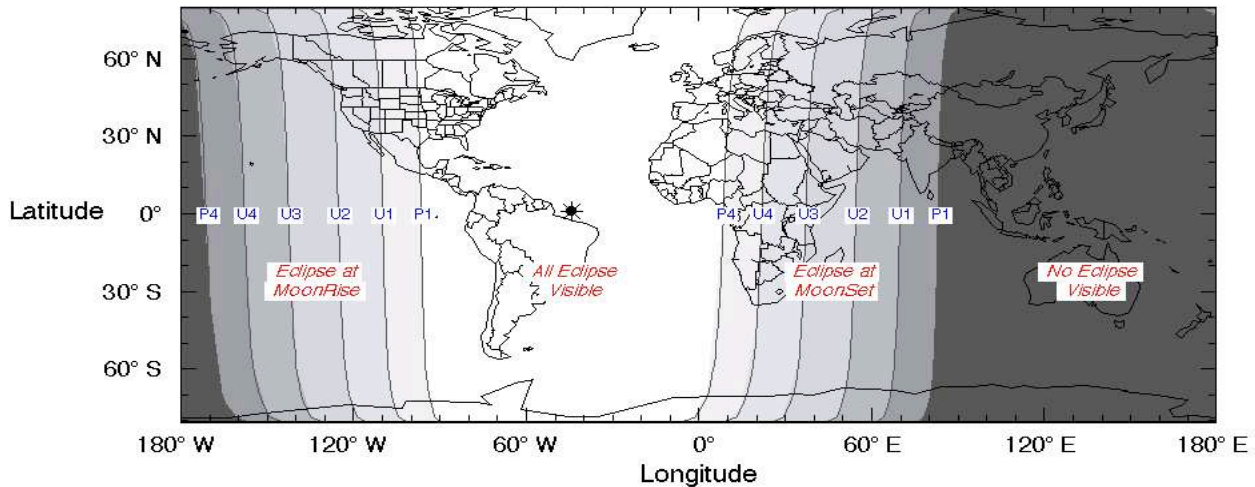
$\Delta T = 69$ s
 Rule = CdT (Danjon)
 Eph. = VSOP87/ELP2000-85

Eclipse Contacts

P1 = 00:11:47 UT
 U1 = 01:07:11 UT
 U2 = 02:11:10 UT
 U3 = 03:23:05 UT
 U4 = 04:27:03 UT
 P4 = 05:22:27 UT

F. Espenak, NASA's GSFC

eclipse.gsfc.nasa.gov/eclipse.html

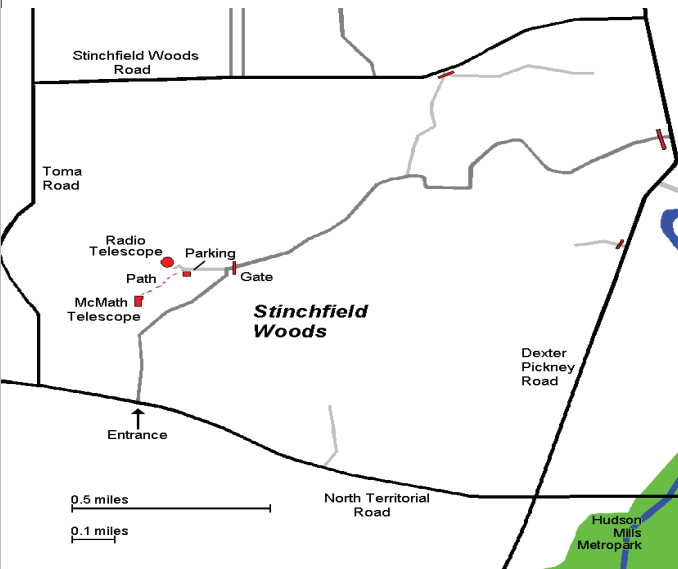


All Times UT! Subtract 4 hours to obtain Eastern Daylight Time. Lowbrows, as of the publication deadline, will be observing from a couple of sites in the area: The Project Grow Community Garden on Platt Road about 1/4 mile south of Washtenaw following the County Parks Night Hike earlier in the evening. AND: The Platt Road soccer fields between Merritt and Bemis. As the month progresses, other Lowbrows will be announcing their plans to observe our area's last total lunar eclipse until January 21, 2019, so watch your email. Remember when choosing a site that the eclipse occurs with the moon moving east to southeast between 20 and 45 degrees altitude above the horizon.

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.

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- Don Fohey
- Ken Ruble
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Lowbrow's Home Page

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University Lowbrow Astronomers

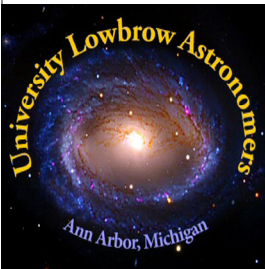
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Reflections & Refractions

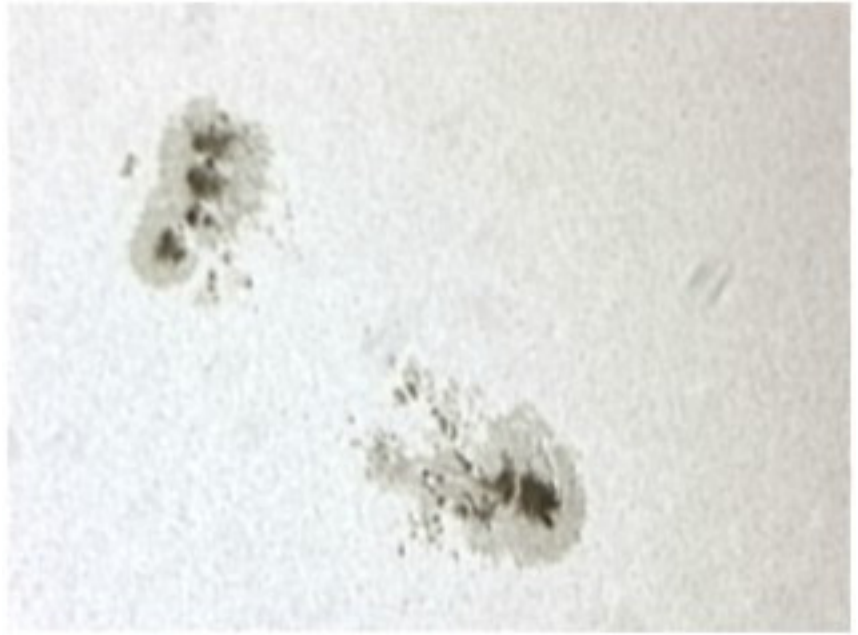


Website

www.umich.edu/~lowbrows/



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Montana Lowbrow Brian Close sends us this Toucam shot of sunspot complex AR 2403 taken August 24. The Earth could easily drop whole into any of the larger spots shown.