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TWO-PANEL MOSAIC OF M45

BY DONOVAN DREW

My image of M45 is a two-panel mosaic. Each panel is about four hours of integration time. This was shot with a ZWO asi294mc-pro looking through an 8" F5 Newtonian sitting on a Celestron AVX.

Taken over the weekend of October 29-30.



TOTAL LUNAR ECLIPSE OF NOVEMBER 8, 2022

BY JIM FORRESTER

You'll have to rise well before the sun to experience the last total lunar eclipse visible from southeast Michigan until March, 2025. Greatest eclipse is at 5:59 AM Eastern Standard Time, but you'll have to be set up 43 minutes earlier to catch the most possible of totality which begins at 5:16 AM and lasts almost 1 hour and 25 minutes. Moonset is at 7:25 AM, just before the end of totality.

A good western horizon is necessary to see this event. The moon is a few degrees north of due west, less than 14 degrees above the horizon at greatest eclipse if observing from Ann Arbor. In downtown Ann Arbor, the top of one of the city's parking structures may work. The athletic field behind Forsythe Middle School has a good horizon. Some spots west of the city, along Zeeb and Parker Roads offer clear views. Lillie Park on Platt Road and some of the public areas at the eastern end of Ford Lake are possibilities. If you find a good spot, let the club know and you may have some company.

The best thing about observing a lunar eclipse, is you don't need more than a clear sky and your own eyes to enjoy this event. This one is expected to be a bright coppery orange. But if you want to do some science, you'll need a telescope and a time piece (your phone will likely work) to help estimate the size of the earth's shadow by recording when the shadow crosses the center of certain craters, both entering and exiting totality. Email your observations to Sky & Telescope: roger.sinnott@verizon.net

Here is a table of craters with predicted enter and exit times. Your submissions don't have to be exact, the nearest 5 seconds will do. ■



	Entry (UT)		Exit (UT)
Grimaldi	9:10	Harpalus	11:47
Billy	9:14	Aristarchus	11:49
Kepler	9:20	Grimaldi	11:50
Aristarchus	9:21	Kepler	11:55
Campanus	9:24	Plato	11:55
Copernicus	9:29	Billy	11:57
Pytheas	9:31	Pico	11:57
Birt	9:32	Pytheas	11:59
Tycho	9:33	Timocharis	12:01
Harpalus	9:37	Copernicus	12:02
Timocharis	9:37	Aristoteles	12:04
Pico	9:45	Eudoxus	12:06
Manilius	9:46	Campanus	12:09
Plato	9:47	Manilius	12:15
Dionysius	9:48	Birt	12:16
Menelaus	9:50	Menelaus	12:18
Plinius	9:54	Tycho	12:19
Eudoxus	9:55	Plinius	12:21
Censorinus	9:56	Dionysius	12:23
Aristoteles	9:57	Censorinus	12:31
Goclenius	10:00	Proclus	12:31
Taruntius	10:03	Taruntius	12:35
Proclus	10:05	Goclenius	12:38
Langrenus	10:07	Langrenus	12:44

TOTAL LUNAR ECLIPSE of NOV 8 continues, p. 3

Total Lunar Eclipse of 2022 Nov 08

Ecliptic Conjunction = 11:03:18.4 TD (= 11:02:05.3 UT)

Greatest Eclipse = 11:00:22.0 TD (= 10:59:08.8 UT)

Penumbral Magnitude = 2.4143

P. Radius = 1.2164°

Gamma = 0.2570

Umbral Magnitude = 1.3589

U. Radius = 0.6783°

Axis = 0.2101°

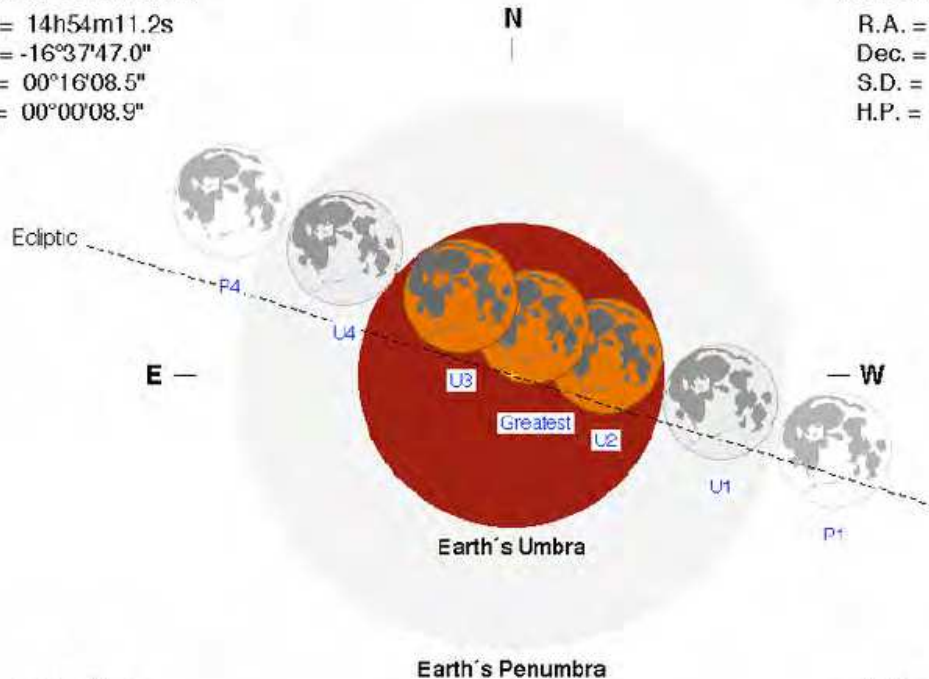
Saros Series = 136 Member = 20 of 72

Sun at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 14h54m11.2s
Dec. = -16°37'47.0"
S.D. = 00°16'08.5"
H.P. = 00°00'08.9"

Moon at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 02h53m48.1s
Dec. = +16°51'06.7"
S.D. = 00°15'17.7"
H.P. = 00°56'07.8"



Eclipse Durations

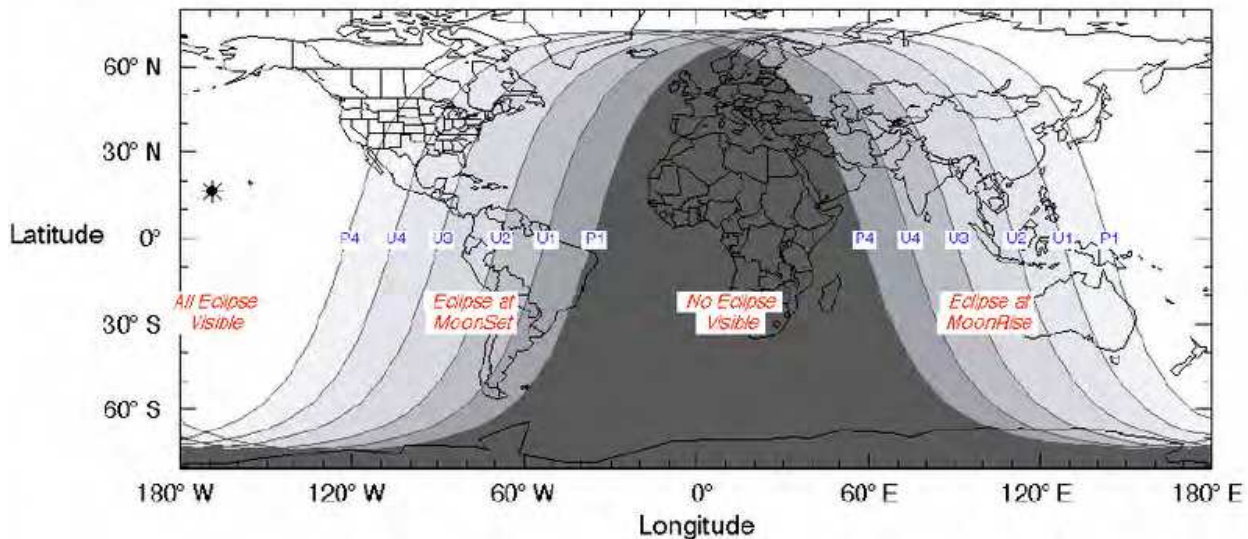
Penumbral = 05h53m51s
Umbral = 03h39m50s
Total = 01h24m58s

$\Delta T = 73$ s
Rule = CdT (Danjon)
Eph. = VSOP87/ELP2000-85

Eclipse Contacts

P1 = 08:02:17 UT
U1 = 09:09:12 UT
U2 = 10:16:39 UT
U3 = 11:41:37 UT
U4 = 12:49:03 UT
P4 = 13:56:08 UT

F. Espenak, NASA's GSFC
eclipse.gsfc.nasa.gov/eclipse.html



FROM THE DESK OF THE NORTHERN CROSS OBSERVATORY

BY DOUG BOCK

We had a lot of clear weather at the beginning of October. I decided to work on the sun since it had some large groups of sunspots on the surface.

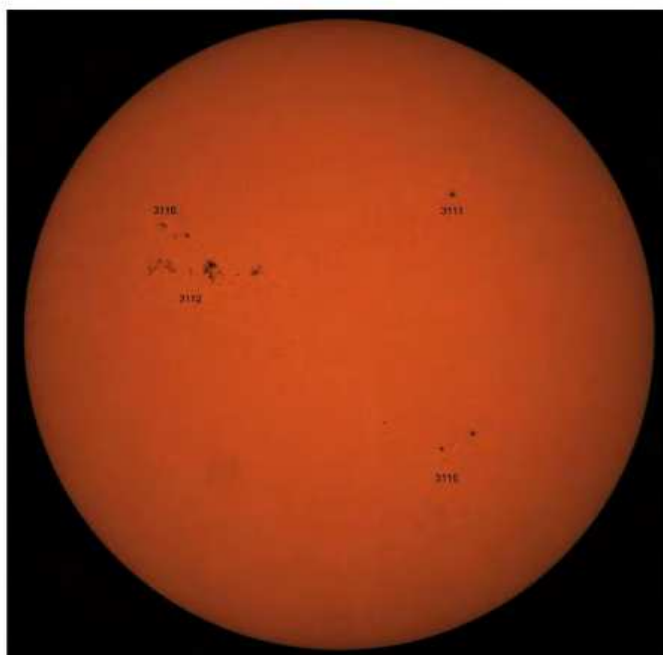
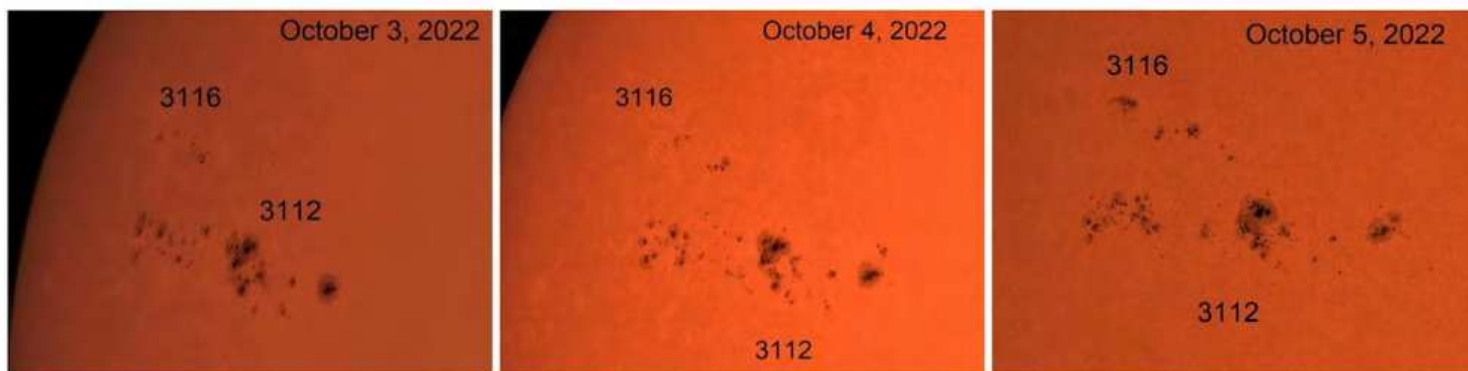
These three images were taken one day apart, October 3, 4, and 5, 2022. Note the rotation of the groupings from one day to the next. On the first day they were near the edge and over the next two days they rotated toward the middle of the sun. The last image shows all the spots on October 5, 2022

Using a 6" f/10 SCT with a white light filter and with the ZWO asi2600MC PRO camera at prime focus, I

took several 60 second videos of raw data. Once collected, I processed them using Autostakkert3 to stack the best 10% of the frames. This is done so that we collect the seconds of good seeing to improve the quality of the final image.

My processing varied with me brightening up the picture in the middle. This may or may not make the spots a little more pronounced. I've highlighted the 2 groups.

If you have solar filters for your equipment or an actual solar scope, you might consider checking out the sun this year as the activity increases through its cycle. ■



Celestron 6" f/10 SCT with the ZWO asi2600MC PRO camera, White Light filter.

MICHIGAN'S LOWER PENINSULA DARK SKY GEMS

BY JEFF KOPMANIS

Our recent vacation highlighted two wonderful dark sky spots in the Northern Lower Peninsula only about four hours from Ann Arbor. We camped at Wilderness State Park (11 miles west of Mackinaw City) and walked through the Headlands Dark Sky Park (an Emmet County park about two miles west of Mackinaw City). Both promise some of Lower Michigan's darkest skies.

Wilderness State Park (WSP)

This park is a hiker's paradise of 10,500 acres with 26 miles of Lake Michigan shoreline and 20+ miles of trails. At the WSP West Lakeshore campsites, you generally have your pick of beach-adjacent sites or forested sites which are less than 100 yards from the beach access. Both Lakeshore campgrounds have less than 100 sites, so they feel very intimate and cozy. At the time of this writing, the East Lakeshore campground is being renovated but promises to be open in 2023. The third campground is Pines, which is not beachfront but has some open spots available as well as trailheads in all directions that one can hike for five minutes to get to open skies. We came in mid-October, so insects weren't a problem, although with forest and swampy areas nearby, it could be intense in warmer months.

Wilderness SP is also a designated Dark Sky park. It has an area where visitors can park and walk to the open beach areas without having to camp there or intrude on visiting campers. Notably, WSP also has a Group Camping area, several small cabins, and bunkhouses that can house up to 24 people each. For the more rustic-minded, there are two groups of walk-in tent sites. All of these facilities would accommodate an astro-event group.

The astronomical views from the beach are mostly NW, N, and NE and don't seem to have any city glow from Mackinaw City, nor much interference from the singular lights across the Upper Peninsula's Straits of Mackinac. Occasional shipping traffic can be seen in the distance, but nothing blocking your horizon.



My H-alpha solar rig setup at the beach entrance



On the beach looking East



On the beach looking West (tip of the peninsula is privately-owned)

MICHIGAN LP DARK SKY GEMS continues, p. 6

The beaches will be excellent spots to view an aurora with their wide expanses of northern skies.

Headlands Dark Sky Park (Emmet County)

We day-visited Headlands Dark Sky Park, as it's only a 5-10 minute drive East of Wilderness State Park. Headlands is a developed park, with a complete guest facility, an amphitheater, and a series of winding, open paths with electric posts that are clearly designed to support star parties. It also has some beach access, although the beach at the Headlands seems to be very rocky and undeveloped. Parking is more limited at Headlands, but they have additional parking across Headlands Road at the Emmet County historic village.

The astronomical views are mostly W, NW, and some Northern. While Mackinaw City is close, the treeline would probably obscure any city glow, and since Emmet County seems very interested in promoting these areas as "dark sky," they'd probably have light regulations to keep city glow to a minimum. The open areas have a tree line, but I'd estimate only about 20-30 degrees worth of viewing would be blocked—much like the Observatory area at Peach Mountain.



The Headlands conference center and gift shop, with outdoor amphitheater

Summary

I could easily see star parties, club events, or even an "Astronomy at the Beach - Up North" event being held at either of these parks. Obviously, the event parameters would be tied to the available facilities, but either would work well as dark destinations in-state. While Headlands offers very nice facilities, Wilderness is probably darker and has much better skies. Both would probably be busy and buggy during warmer months.

We camped at Wilderness the week of October 10-16, and most nights were in the mid-40s, but our first night there dipped into the 30s and with a brisk breeze coming in off the Straits, it made for a bone-chilling cold. But the convenience of being so close to a huge, wide-open sky, beach-front was positively luxurious. ■

The "star party" area



OVER THE HORIZON

Observing: (all times EST)

Daily Saving Time -> November 6. Fall Back.

Average Sunrise 07:30, Sunset 17:15 (after the time change).

BY JACK SPRAGUE

Dark Matter!

These two words still garner a fair number of disbelieving looks on the cocktail party circuit. Indeed, the stuff conjures the “fudge factors” of inaccurate equations and unexplained phenomenon. Evidence mounts that we are only a few years away from discovering a way of remotely observing the stuff.

Our Low Power Lovely this month provides a means of directly observing its impact – literally. Galaxy Caldwell 62 shows a void currently believed to be the result of a collision between the galactic disk and a subhalo of Dark Matter. The hypothesis emerges as there appears: (a) clearly a void in the disk; and, (b) no discernable neighborhood object which explains the void in other terms.

Unique? Yes. Disk voids are rare. Our models of galactic evolution are however not complete. Hopefully, JWST will help. Please look for yourself and see the collision results of a galaxy (at 70Kly across) and dark matter.

Our challenge object is actually not all that much of a challenge. A trio of lovely stars occupies a fairly innocuous area of space in Andromeda. What is challenging is discovering a group of stars that belongs to some recognized group and then finding that group reference!

I hope to write in the future a guide of handy tips on running this sort of observation to ground but for this month, suffice that Hough 197 is one such group I was able to find defined. It represents a group for which I am very proud to have identified.

One of our experienced members has promised to coach me on star and star group identification and assures me it no longer involves the dividers and a several-thousand-page deep star atlas method from my youth.

I find the triangle the trio forms a delightfully crisp image in my 5” refractor.

The Moon Phases:

Date	Day	Phase	Rise	Set
01 Nov	Tuesday	1 st Quarter	Rise 14:56 (31 st)	Set 00:03
08 Nov	Tuesday	Full Moon	Rise 17:01 (7 th)	set 07:51
16 Nov	Wednesday	Third Quarter	Rise 23:12 (15 th)	set 14:00
23 Nov	Wednesday	New Moon	Rise 07:14	set 16:50
30 Nov	Wednesday	1 st Quarter	Rise 13:37	Set 00:39 (Dec 1 st)

Meridian Constellations as of 15 November – 22:00 hours.

(-), (--) represent a positional modifier to constellations and objects east of the meridian by less than an hour and more than an hour. (+), (++) represent a positional modifier to objects west of the meridian by less than an hour and more than an hour, respectively.

I mention here a few objects contained in the constellations which I find meaningful. The list is in no way comprehensive!

From the southern horizon to the northern horizon along the meridian as of 10PM on the 15th:

--Southern Horizon--

Sculptor

(+) C 72 String of Pearls (galaxy)

C 70 Southern Pinwheel Galaxy (M 83 – a different object in Hydra – is also called Southern Pinwheel. As always, the common names are less constrained by concerns such as uniqueness.)

C 65 Sculptor Galaxy – Silver Coin Galaxy
Burbidge Chain (galaxy chain)

Cetus

C 62 galaxy

(++) Wolf Lundmark Melotte WLM irregular galaxy

C 56 Skull Nebula (planetary)

C 51 dwarf galaxy

Pisces

(-) NGC 488 Whirligig Galaxy

Triangulum

M33 Triangulum Galaxy

Andromeda

NGC 404 Mirach’s Ghost – dwarf lenticular galaxy

(-) C 28 open star cluster

C 23 Silver Sliver Galaxy

M 52 open cluster

M 31 Andromeda Galaxy

M 110 galaxy

OVER THE HORIZON continues, p. 8

(-) Perseus

NGC 1023 lenticular galaxy

M 34 large open cluster

M 76 Little Dumbbell Nebula (planetary)

Cassiopeia

C 18 dwarf spheroidal galaxy

C 17 dwarf spheroidal galaxy

NGC 281 (sh-184) Pacman Nebula – emission nebula

C 13 Dragonfly cluster/Owl cluster – open cluster

M 103 open cluster

C 10 Lawnmower cluster – open cluster

C 8 open cluster

Cepheus

NGC 3172 Polarissima lenticular galaxy

C 1 open cluster

Draco

C 3 galaxy

NGC 4605 Faberge Egg Galaxy – Frankenstein Galaxy

--Northern Horizon--

Low Power Lovely

The milkweed pods in my meadow adjacent to my observing pad are small shriveled things this year. The butterflies gorged so heavily on my stock that I may have only a few for their offspring to visit next year.

I mention these as spending some time in Cetus this last weekend, I came across a galaxy I have only witnessed one other time: C 62 (RA 00h 47' Dec -20° 46'), the Milkweed Seed Galaxy!

The star of Cetus is C 65 also called the Silver Coin Galaxy. This bright, massive beastie is nearly 26' across and stands out well in any casual sky tour (RA 00h 47' 36", Dec -25°). This month's Low Power Lovely is also large at 22' x 7' and at magnitude 9.2 is easy enough to find even when seeing conditions are only average.

C 62 is a dwarf spiral seen nearly edge-on. It forms a nice "smear" of fuzz across my lens. It is very close to the Milky Way lying "the next local group over" at 11Mly distance. The diameter runs approximately 70Kly.

What is unique about C 62 and why you should seek it is that it has direct evidence of contact with Dark Matter (cue dramatic music). The galaxy's disk has a void believed currently to be explained by a collision

with a bit of dark matter (a subhalo) which deformed the galaxy and perhaps ejected part of the matter constituting the void we now see.

Admittedly, the void is smallish but at low power (best for capturing the light), the void appears to occupy 25% - 30% of the disk on the "north". It occupies less in high resolution photos but the diffuse area at the void's edge makes the effect seem larger through the eyepiece. Searching for this galaxy and giving it a long observation under good conditions will reward the observer with a rare indication of dark matter effects.

There are few elements of Dark Matter's visual evidence we can capture at low power. C 62 is one!

~C 62 is cited in some materials as a member of Sculptor.~

Optical Challenge

Hough 197 is a trio of stars labeled SA 73068 in Andromeda (RA 23h 11' Dec 38°13') very near galaxy NGC 7640 (RA 23h 22' Dec 40° 51').

The trio is relatively easy to spilt but for me they require good seeing conditions. The primary is a mag 7.9 yellow-white star. The secondary is mag 9.7 and is a bit whiter. The tertiary is mag 10.2 and maybe a slightly more yellow hue. The color is uncertain to me but the fact the three have different gradients is not lost.

The trio form a nice triangle and I happened upon them framing NGC 7640 for a series on galaxies possibly deformed from interactions that are not in the Arp atlas (NGC 7640 is approximately 10.5' x 2' in size, makes an easy imaging target given a magnitude at 12.0 and presents a good fit for my interests though its deformed plane takes a good bit of integration to resolve). The trio resolved so nicely, I had to go in search of a definition of the group finding it in the Smithsonian Astronomical Observatory Star Catalogue.

In my Explore Scientific 127mm refractor reduced to 680 mm, the trio frame nicely with only a little camera adjustment.

I seldom pursue double or multiple-star groups independently but when I find something I think is known to other observers, I go searching for a reference. Normally, I find none. "Discovering" Hough 197 and a reference to it proved very satisfying and I hope – in good seeing – it proves as satisfying to you. ■

A TIMELAPSE OF JUPITER

BY AWNI HAFEDH

My favorite type of photography with fast-moving targets is time-lapse. This year I purchased a Celestron 11" with an Alt-Az mount. It works like a charm with lunar and planetary imaging and tracks really well.

With any mount, keeping a target in the middle of the field of view will require guiding. We autoguide on a star with a DSO, but with planetary -- at least for me -- I use FireCapture Autoguiding. This is amazing at keeping a feature in the same field of view. I am not going to explain it, as you can Google FireCapture Autoguiding and you will learn how awesome it is.

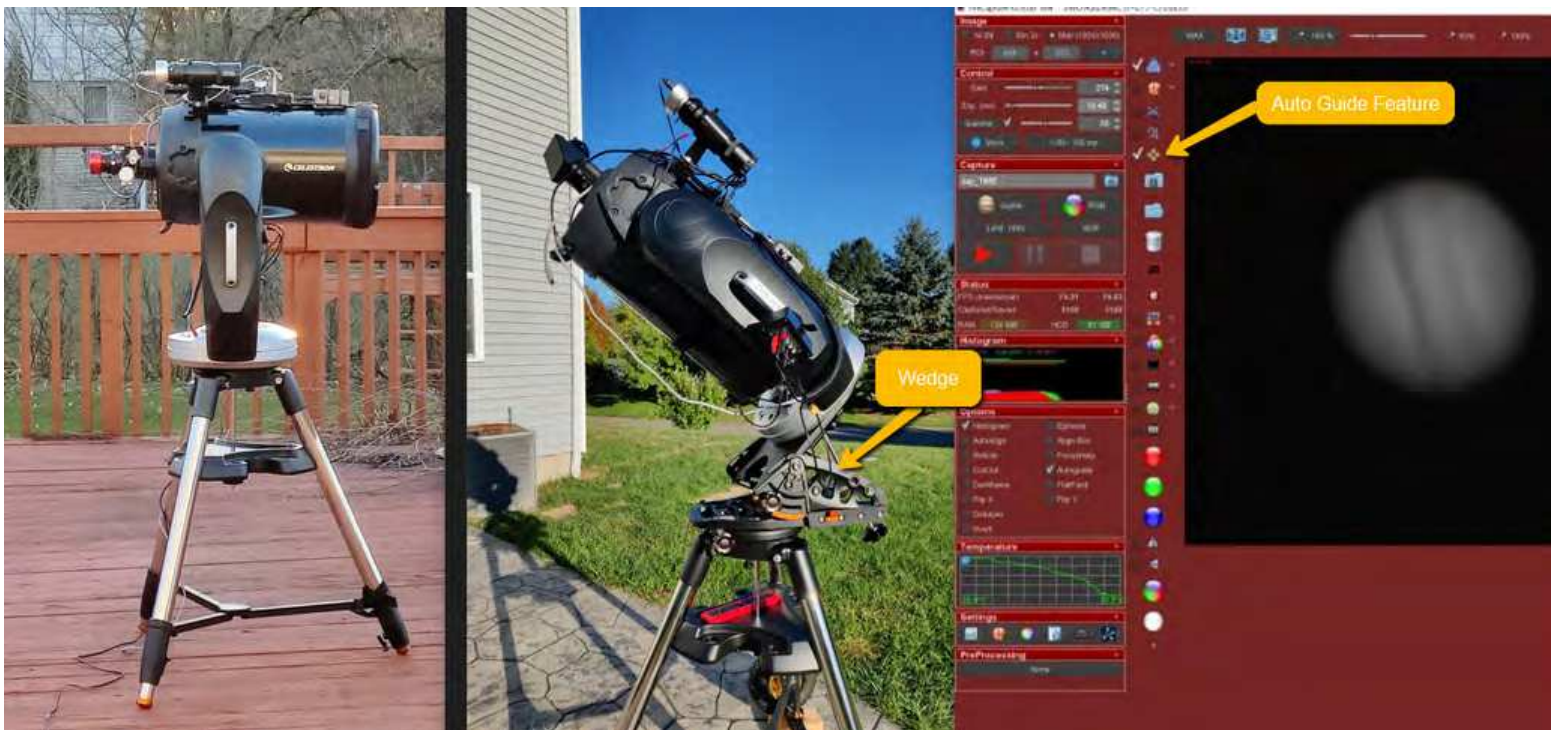
Unfortunately, this feature doesn't work at all with an Alt-Az mount. I tried to find a post or article that explains how it works without any luck until a few friends suggested I get a wedge and convert the

Alt-Az mount to an EQ mount. Bingo! That fixed the problem. FC autoguiding worked flawlessly and as a test, I was able to capture Jupiter for two hours without babysitting the mount.

This time-lapse was created from a 57x1500 frames video with a 2-minute delay. Each video was stacked in AutoStakkert3, processed, and sharpened with Astrosurface and Pixinsight. The final video was created in PIPP. I hope you like it. ■



Lowbrows reading the pdf online can click on the image to pull up Awni's YouTube video at: <https://youtu.be/ruEJV2a5PYs>



2023 RASC OBSERVER'S HANDBOOKS AND WALL CALENDARS

Hello, Lowbrows, I'm taking orders for the 2023 issues of the Royal Astronomical Society of Canada (RASC) observer's handbooks and wall calendars. Prices this year are \$18.00 for the calendar and \$26.00 for the handbook. As in past years, I must receive your payment for you to reserve your copy/copies. I accept PayPal and personal checks. Look for the email I sent to the membership on October 14 for detailed instructions. If you cannot locate that email then contact me and I'll re-send it to you.

In a departure from the past, this year I pre-ordered 20 copies of each through the Astronomical League. What hasn't changed from past years is that you **must send me payment to reserve your copy**. I will reserve your item(s) on a first-paid first-reserved basis, meaning once I receive payment for 20 of each, I will no longer be able to reserve more. So you should act fast. As of this writing, there are seven calendars and nine handbooks still available to reserve. Because of limited quantities, I must limit you to one copy of each. Also note that though I ordered the publications through the Astronomical League, you do not have to be an A.L. member to order. They're available to all Lowbrow members.

Delivery will be in December. Jim Forrester has graciously offered to distribute the items when they arrive.

For descriptions of these excellent publications, refer to the following links:

<https://www.rasc.ca/observers-calendar>
<https://www.rasc.ca/handbook>

Remember, reservations are filling up fast, so send me your payment now. You don't want to miss out!

Doug Scobel, Treasurer ■



UPCOMING MEETING SPEAKER SCHEDULE

NOVEMBER 18: Professor Neil

Cornish, Montana State University.

Topic: **Pending**, but about

Gravitational Waves

DECEMBER 16: Fred Schebor. Topic:

The Artsy-Meaningless Slide Show

JANUARY 20: Dr. Guy Consolmagno,

Director of the Vatican Observatory.

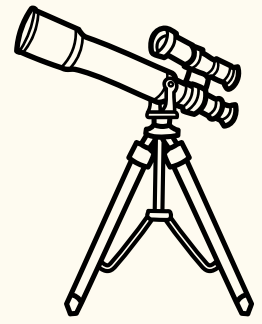
Topic: **Pending**

FEBRUARY 17: TBA

MARCH 17: TBA

UPCOMING TOPICS FOR THE OBJECTIVE LENS

BY JACK SPRAGUE



All images are welcome and while we have a monthly theme, we love any submission.

Images submitted will be included in "The Objective Lens" and in the annual **Backfocus** compilation without any rights transfer beyond your permission to allow The University Lowbrow Astronomers use of your image for inclusion in these two documents.

December – December and the holiday edition is all about the glow and diffuse light from nebosity: planetary, emission, reflection, vague hydrogen-intensive areas, and man-made (yes, the Moon above your holiday-decorated roof in a nightscape would qualify as nebosity). December is the month to show the glow.

January – Stars! After all, aster-onomy! Doubles, triples, quads, double-doubles, multiples! We'd love to see short frame captures of stars in groups. This is also a real chance for eyepiece AP work as stars lend themselves well to short-exposure improvised pictures. Eyecups work best for me when improvising with a cell phone snap though they are hardly required. Just be careful of the eyepiece! With the "continuous focus" features of most cameras, amazingly clear central image shots are quite possible, especially with 82° or better wide-field eyepieces. Please share! Multiple submissions are certainly allowed. Adding a catalog number of at least one of the stars, magnitude, and separation would be extremely helpful.

February – Frozen Observations. The theme this month is evidence of those uniquely Michigan observation events. DSLR on a tripod by the snow mound at the end of the driveway? Snowman seemingly interested in DSO capture? Parka-clad observers practicing ACNO (the "c" stands for "cold" here)? Warming pit gathering (some of us use a Solo stove for winter obs) with parka, snow boots, hot coffee, and fresh cookies? Observatories covered in inches (feet?) of white stuff? Our treasurer in front of a palm tree? All of these are welcome images.

Things to come include mobile observations: observations and observers observing outside of the home environment. Make sure and take snaps from Joshua Tree, the west side of Florida, Costa, the Namibian Safari, and your sojourn to Kuai. We will cover these in the near future. Get those portable units back in action! ■

Lowbrow General Membership Meeting Friday October 21, 2022.

Charlie Nielsen (President): Charlie introduces Elena Gallo (Professor, U-M Astronomy).

Elena Gallo: Elena gave a presentation "Seeing and Hearing Black Holes"

Elena started with a brief history of General Relativity: Einstein's publication of the theory in 1915, followed by various confirmations. General Relativity predicts there could be objects so dense that not even light could escape. Such objects are now called black holes.

It is now predicted that most/all galaxies have a supermassive black hole, millions or billions the mass of the sun. In addition, each galaxy is expected to have 100's of thousands if not millions of stellar mass black holes, each of which will have a mass of about 5 to several tens of solar masses.

This is partially supported by various observational evidence, which includes images of two different supermassive black holes.

When a pair of black holes merge into a single black hole, they produce gravitational waves. The Laser Interferometer Gravitational-Wave Observatory (LIGO) has observed gravitational waves from some of these mergers. Each event can be converted to sound.

In the future, we expect that observations made by the James Webb Telescope, the Extremely Large Telescope (ELT) and by Laser Interferometer Space Antenna (LISA) will add to our understanding of black holes. (LISA is a proposed experiment, essentially placing the equivalent of LIGO into space. LISA is expected to observe the mergers of supermassive black holes).

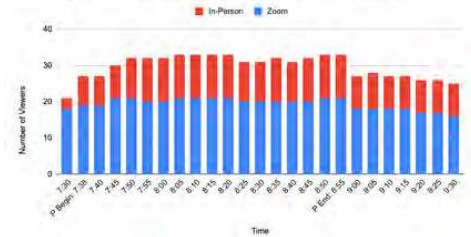
Elena answered questions from club members.

Charlie Nielsen: There will be an open house tomorrow (Saturday October 22) and another open house on Saturday October 29. Charlie cannot attend either one. Jack Brisbin and two other people had volunteered, but Charlie was initially concerned this was not enough. But Adrian Bradley volunteered to be open house coordinator and Jim Wadsworth volunteered to be the greeter. So, the open house can take place as scheduled.

Next Saturday, same thing. It is dependent on weather and volunteers from the club.

Meeting Attendance

October 2022 - Elena Gallo - U-M Astronomy - Seeing and Hearing Black Holes (sig and sheet)



The Student Astronomical Society (SAS) will piggyback on tomorrow's open house.

Need to work on speakers. Currently have: December - Fred Schebor. "Artsy Meaningless Slide-Show." January - Brother Guy Consolmagno (Director of the Vatican Observatory, and President of the Vatican Observatory Foundation). November - Neil Cornish.

Jim Forrester (Vice President)

- Adrian will pick up the keys from Jim. Jim cannot attend.
- There was an inquiry about the ACNO list (The Any Clear Night Observers List). Jim thought too many non-members were on the list [the list is still active, and we are still adding members].

Charlie Nielsen

Since John Causland's passing we really haven't been using the ACNO list. [There was a suggestion to remove non-members from the list to make it more useful].

Dave Snyder (Vice President)

- A possible speaker is Elena Adams (DART Mission Systems Engineer at Johns Hopkins University Applied Physics Laboratory). Dave had attempted to contact her but had not received a response.
- Dave was going to contact Buddy Stark (Planetarium Manager at the U-M Museum of Natural History).

Jim Forrester

- Nobert Vance invited us to the planetarium at Eastern.
- Jim had a great time at the Okie-Tex Star Party; however, he got sick.
- Adrian is on Belle Isle. He may connect to this meeting remotely, there is some kind of outreach event there.

Jack Brisbin (Observatory Director)

- Jack plans on opening for the open house on October 22. Adrian will show up at 6PM. Things seem to be working OK. Jack cannot be there October 29.

Jim Forrester - Jim should be able to make the next open house.

Jeff Kopmanis (Online Coordinator)

- There were 33 max attendees for tonight's meeting. 21 on Zoom, 12 in person.
- Jeff found a book "Astroquizzical - The Illustrated Edition: Solving the Cosmic Puzzles of our Planets, Stars, and Galaxies" by Dr. Jillian Scudder. It is a good general introduction or primer on astronomy.
- Looking at improvements to the club website. Should have more time coming up.

Jack Brisbin - Jack has sheets of Rubylith. He will make them available at \$1 for each sheet.

Amy Cantu (Newsletter Editor) - no report.

Doug Scobel (Treasurer)

- We have 192 memberships. This is after removing memberships we had extended since early 2020 due to COVID-19 pandemic considerations.
- We have \$12,926.48 in the treasury. This includes a recently received \$100.00 "thank you" check from Westland Library.
- RASC Observer's calendars and handbooks have been ordered through the Astronomical League. I pre-ordered 20 copies of each, and they will be available to members on a first-paid/first-reserved basis. As of this writing there are 7 calendars and 9 handbooks available to reserve. Items will be delivered to Jim Forrester for distribution in December. Check your email for details.
- Besides our usual monthly costs for the Open House "hotline" and printed newsletter printing and mailing costs, recent expenditures include: \$289.87 for observatory and 17.5" Dob maintenance, and repairs made to the two-track road to the observatory (thank you, Jack!). \$880.00 for the pre-order of RASC calendars and handbooks.

Jack Brisbin - Jack plans to open the observatory at 6:30PM

Jim Forrester - Adrian told me he would open the gate at 6:00PM.

Jack Brisbin - At the observatory a couple weeks ago. With clear skies everything should work out OK. Its reopening week at Belle Isle. Jack suggested Jim Wadsworth show up at 6:15PM.

Charlie Nielsen - Adjourned the meeting

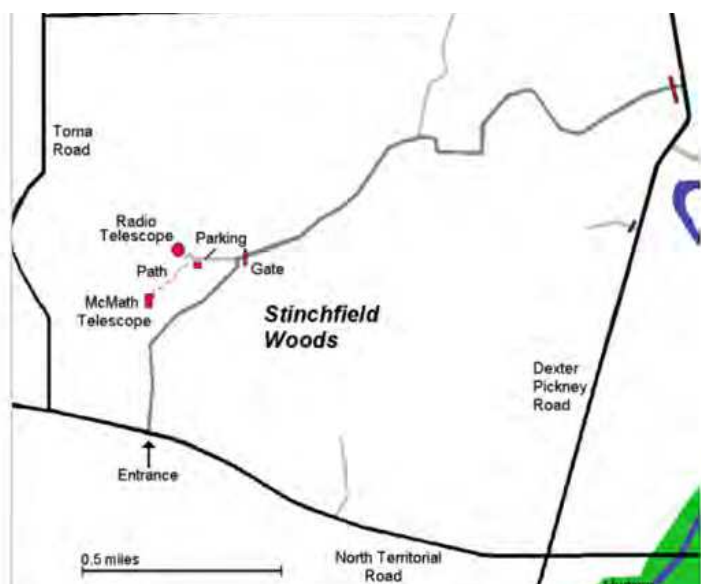
After the meeting, **Adrian Bradley (Vice President)**, who was not present at the meeting itself, sent this email addition:

During last night's meeting, I attended a Detroit / Belle Isle astronomy outreach night. Around 100 or so people came through a path outside the newly renovated Nature Center. There were scopes of all types, about 8 total, and people lining up to see Jupiter, Saturn, and the Andromeda galaxy. A few different people had many, many questions about all things pertaining to space and we answered them as best we could.

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). Dues can be paid by PayPal or by mailing a check. For details about joining the Lowbrows, contact the club treasurer at: lowbrowdoug@gmail.com

Lowbrow members can obtain a discount on these magazine subscriptions:

Sky & Telescope - \$43.95/year

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:

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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



www.youngastronomer.org