PHOTOGRAPHING THE ECLIPSE ON APRIL 8, 2024

PRESENTATION BY: LAURA PARISI

#1 RULE WHEN PHOTOGRAPHING THE ECLIPSE:

Never Look DIRECTLY At The Sun BEFORE OR AFTER TOTALITY WITHOUT Eye And Camera PROTECTION


Path of
Total Solar Eclipse
April 8, 2024
CANADA
Minneapolis
Ottawa
Montreal
Bangor
Halifax
Toronto
Burlington
Buffalo
Chicago
Cleveland
Kansas City
Indianapolis
Springfield
Louisville
Oklahoma City
Nashville
Little Rock
Dallas
Austin
San Antonio
MEXICO
Mazatlan
Greatest
eclipse
19:30 UT
19:00 UT
18:30 UT
18:00 UT
ATLANTIC
OCEAN
PACIFIC
OCEAN
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TIMING OF THE ECLIPSE

AUGUST 21, 2017

ATHENS, TENNESSEE

- 1:00 p.m. – Full sun
- 1:03:49 – Partial Eclipse begins-first little bit of sun being covered by the moon
- 2:32:33 – Totality began
- 2:33:51 – Maximum Eclipse
- 2:35:08 – Totality ended and Partial Eclipse begins again
- 3:58:39 – Partial Eclipse Ends - Full sun

GEAR TO USE

- The longest lens you have to get a tighter shot
- And/or a wide angle to be able to make a composite with multiple phases of the eclipse
- Fastest lens you have (F2.8 or F4 would be the larger opening and lets in more light so you can use a lower ISO)
- Tripod with easy to adjust tripod head

FILTER TO USE (PART 1)

- **Filters and glasses for viewing the sun must be ISO 12312-2 - these filters block out a huge percentage of visible light and most importantly the UVa and UVb rays that can cause permanent retina damage and infrared radiation.**
- **If your filter has an EN number it was likely made in China and they use the European safety standard. If the testing was done in the US, it would carry the ISO number.**
- **When buying a solar filter or solar gel film (Polymer films similar to a thin sheet of plastic sometimes called mylar or gel):**
  - **Do NOT BUY IF THE ITEM STATES "Not ISO 12312-2 compliant and therefore not safe for direct viewing of the Sun. Always use approved ISO 12312-2 certified safety glasses when viewing the Sun directly. Never use photographic neutral density filters for direct solar viewing, viewing the sun through an optic, or when using cameras with an optical viewfinder."**

FILTER TO USE (PART 2)

- **Round screw on solar filter OR Use Lens hood to attach solar mylar filter to lens (my preference)**
  - **WHY? because with the screw on filter you could accidentally knock the lens out of focus while screwing the filter on or off, and you may not realize it because of the short amount of time of totality and then you have poor images from that point forward.**
- **A Word of Caution: If you use a 15 Stop Neutral Density (ND) Filter that is not graded for solar viewing, please be careful -- Solar filters have protections to block the Ultraviolet (UV) and Infrared rays (IR). If you did not buy a SOLAR FILTER AND ONLY BOUGHT AN ND, please only look thru the LCD Screen and NOT THE VIEWFINDER. You can harm your eyes.**
- **Point the camera away from the sun when attaching and removing the solar filter.**

SETTINGS TO START WITH FOR YOUR CAMERA

- You can use manual exposure
- A good starting point for the camera settings is: ISO 400, 1/1000 second, f8.
- You probably will have to adjust this to fit the conditions in the sky as well as your equipment.
- Important to keep ISO low to prevent noise (all cameras are different)
- Important to keep shutter speed a bit higher to prevent movement of the sun/moon

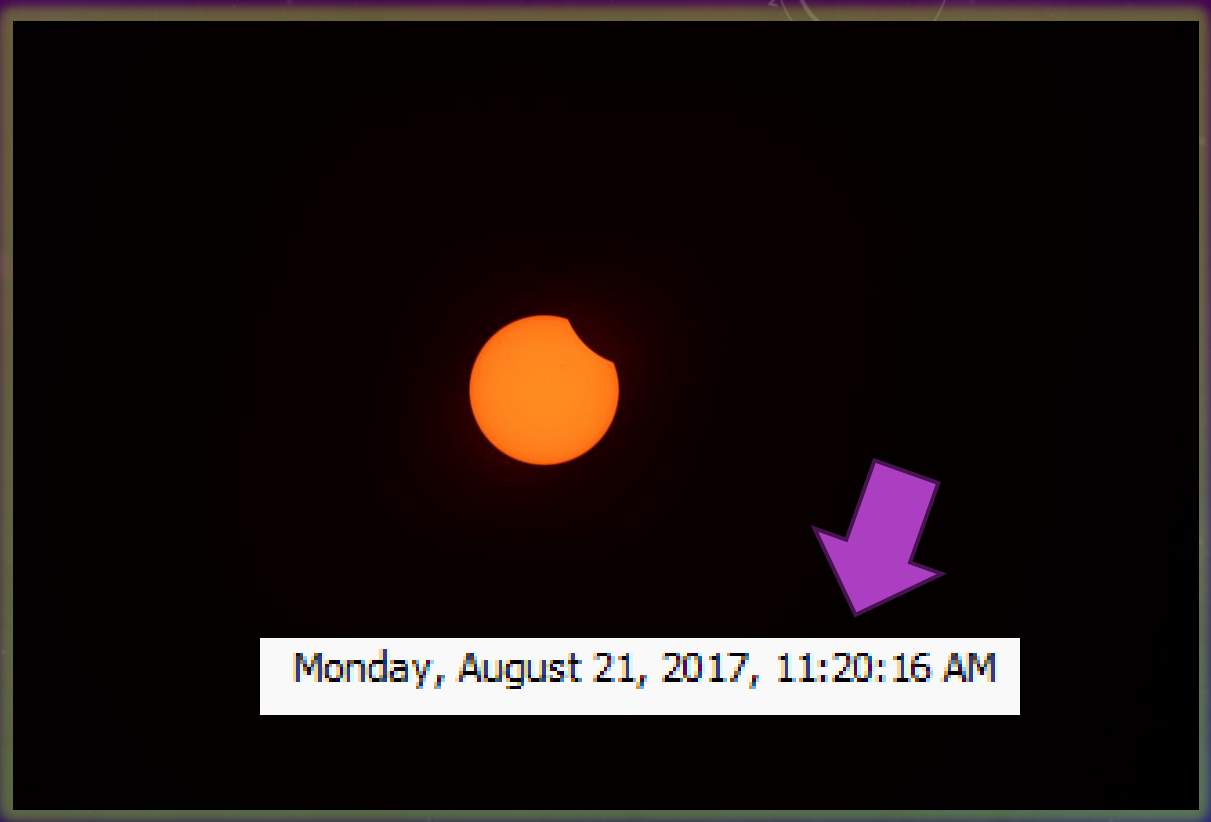
How to focus for the eclipse

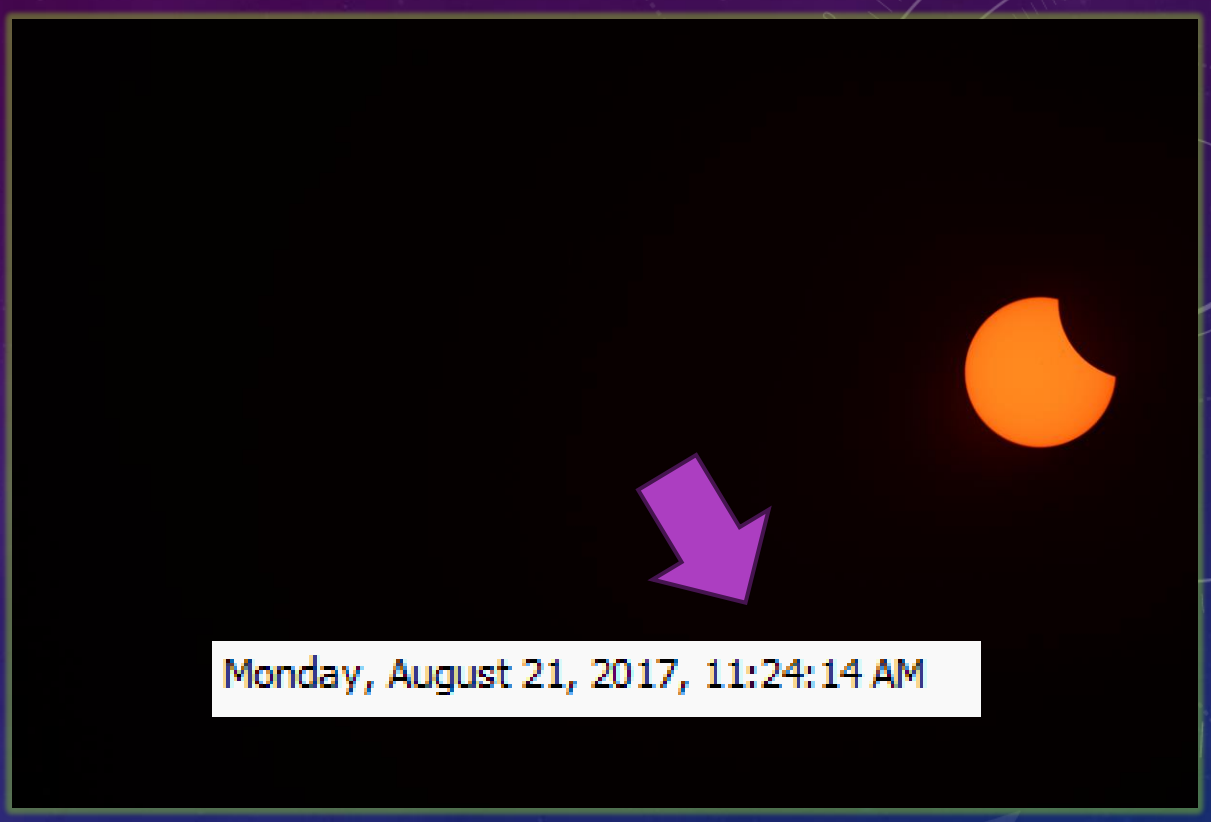
Use Spot Focus, then Autofocus to focus on something in the far distance (you can focus on the moon if you can see the moon - do not try to focus on the sun unless you have your filter at the far end of your lens), then change to manual focus, MICRO FOCUS , use Live View, Zoom in as far as possible while looking at your LCD Screen then slowly adjust your focus ring until it is super sharp, tape your lens so your focus point will not move if bumped, THEN PUT YOUR FILTER ON (if not on from focusing on the sun.

DO NOT JUST SET CAMERA TO INFINITY. CAMERAS ARE MADE TO OVERFOCUS TO ALLOW FOR MICRO ADJUSTING CAMERA TO OPERATE WITH LENS.

ACCESSORIES TO CONSIDER

- Step Stool or a chair low enough to get under the camera to look up in the sky - consider a pillow on the stool for comfort
- Hood cloth - Consider a dark piece of fabric over your head and camera to block out the glare while looking through the lens. Similar to Ansel Adams.
- If you wear eye glasses for distance, consider bringing a second pair of eye glasses. This will allow you to attach the solar filter on one of the glasses – you will only have a short period of time to take the filter off at totality and then put the filters back on right after totality. Best if you have one pre-mounted and can just change glasses.
- Gaff Tape (to secure mylar filter and tape focus in place on the lens once in manual)





HOW FAST THE SUN/MOON MOVES:

YOU MUST KEEP ADJUSTING YOUR CAMERA TO KEEP THE SUN/MOON IN YOUR VIEWFINDER

THINGS TO DO TO PHOTOGRAPH THE ECLIPSE (PART 1)

- Clean all lenses
- Set date and time in camera
- Consider setting copyright in camera with your name
- FULLY CHARGE BATTERIES AND CLEAR LARGE MEMORY CARDS – don't want to need to change during Totality, but do bring extras just in case
- Set tripod at highest height without using the center column allowing you to stand/sit comfortably under the tripod with the lens pointing up into the sky

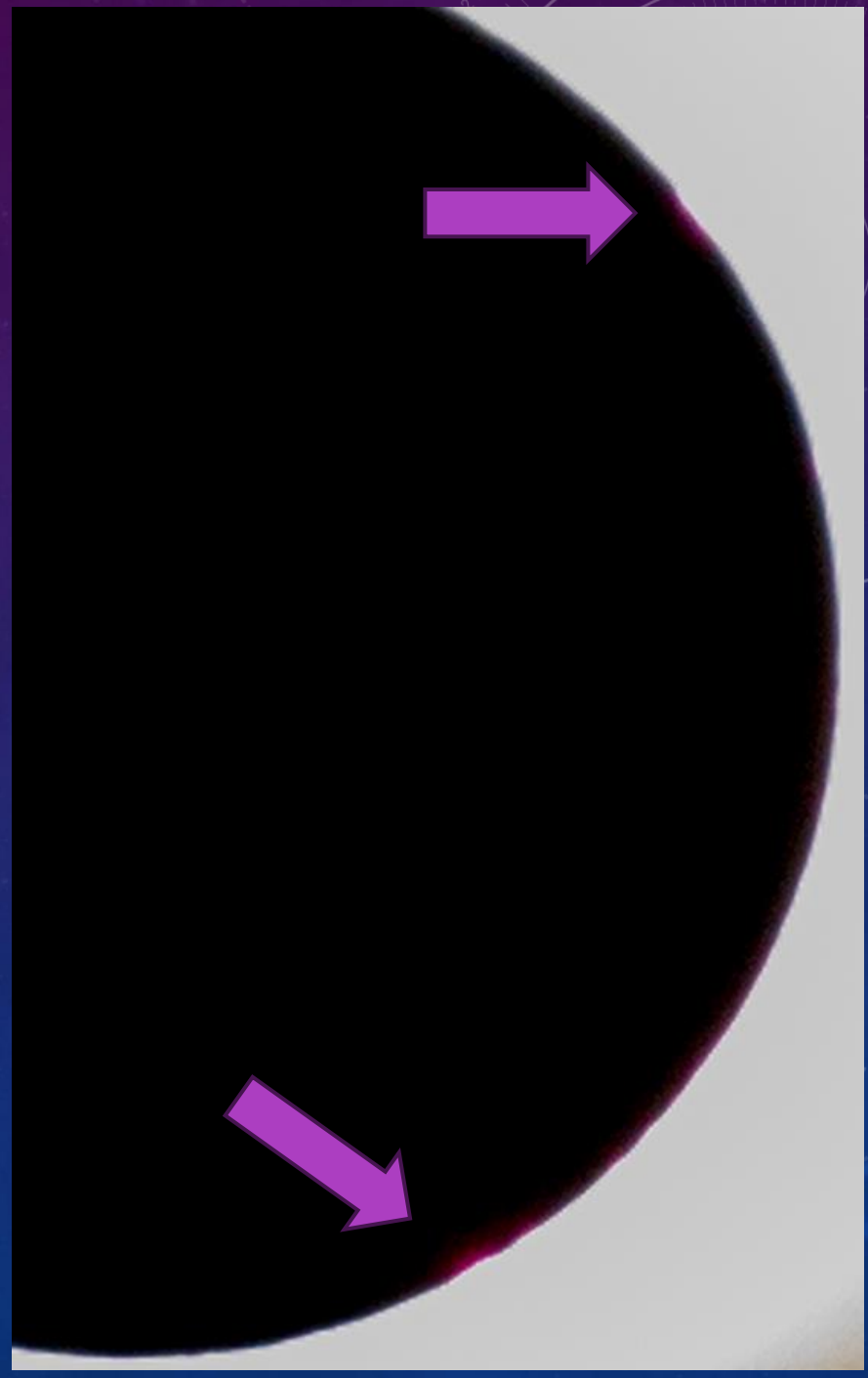
THINGS TO DO TO PHOTOGRAPH THE ECLIPSE(PART 2)

- Set camera to record images in RAW and if you want also JPG. RAW will give you the most detail when you go to post process your images. Even if you don't know how to use RAW today, as you learn post processing better, you can go back and use the RAW files to get great results. Remember JPG files throw away a lot of the details and RAW files keep all the details.
- If you are switching from viewing directly with your eyes/viewing thru the camera or viewing thru your binoculars: you must wear your solar glasses while looking directly at the sun before AND after Totality. If you go from viewing the sun directly to photographing, turn away from the sun and take off your glasses, close your eyes and then look thru the camera with the filter at the sun /far end of your camera. The same process would be in effect if you are looking thru binoculars instead of the camera.

INTERESTING ITEMS

- Eclipse experiments: Wear red or green during the April 2024 eclipse for a fun science lesson Lianna Norman USA TODAY NETWORK – Florida If you want to experiment with color and optical science this eclipse, have one of your friends or family wear green and dress yourself in something red (or vice versa). You can compare how the red clothing seems to fade to a shade of gray as the green clothing seems to get brighter.
- There is a 12 stop variance between the inner and outer Corona
- Every 18 months or so – somewhere in the world – a total solar eclipse takes place.
- The next Visible Total Solar Eclipse to happen in our area August 22, 2044 and August 12, 2026 in Iceland
- Delta Air Lines is Offering Special Flights Along the Solar Eclipse Path
- An **umbraphile** is a person who is passionate about experiencing total solar eclipses. The term “umbraphile” comes from the Latin word “umbra,” which means shadow. Umbraphiles are often willing to travel long distances and endure unpredictable weather conditions to witness a total solar eclipse.

BAILY'S BEADS (AREAS IN RED AT ARROWS)

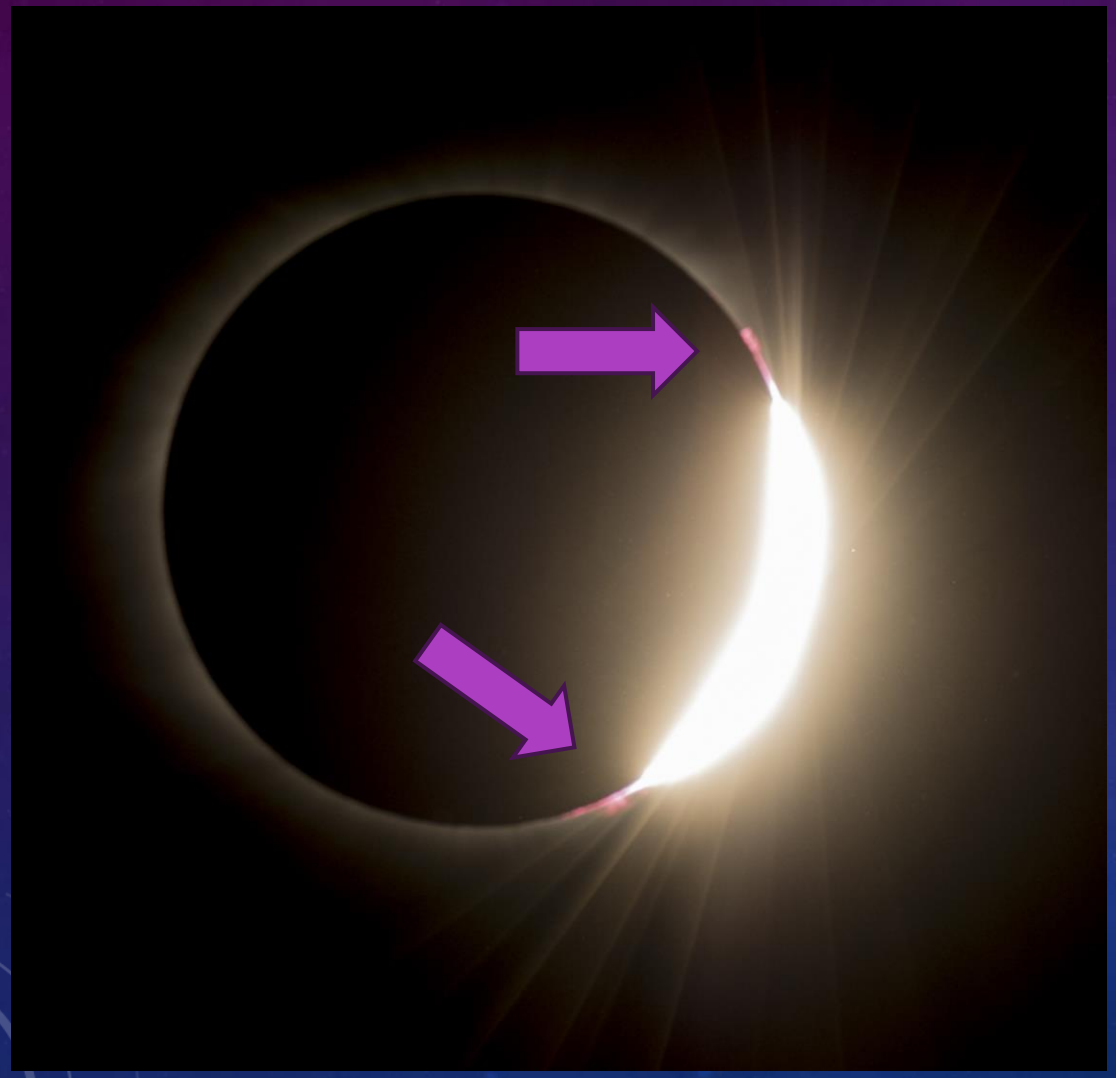


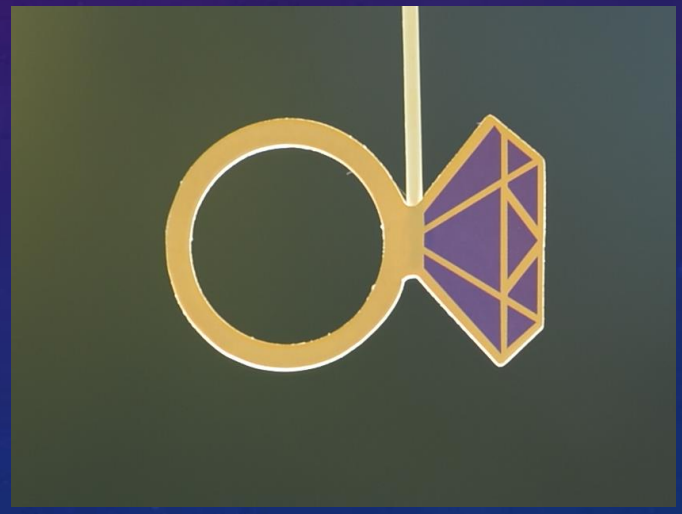
The Baily's beads, diamond ring or more rarely double diamond ring effects, are features of total and annular solar eclipses. Although caused by the same phenomenon, they are distinct events during these types of solar eclipses. As the Moon covers the Sun during a solar eclipse, the rugged topography of the lunar limb allows beads of sunlight to shine through in some places while not in others. They are named for Francis Baily, who explained the effects in 1836. The diamond ring effects are seen when only one or two beads are left, appearing as shining "diamonds" set in a bright ring around the lunar silhouette.

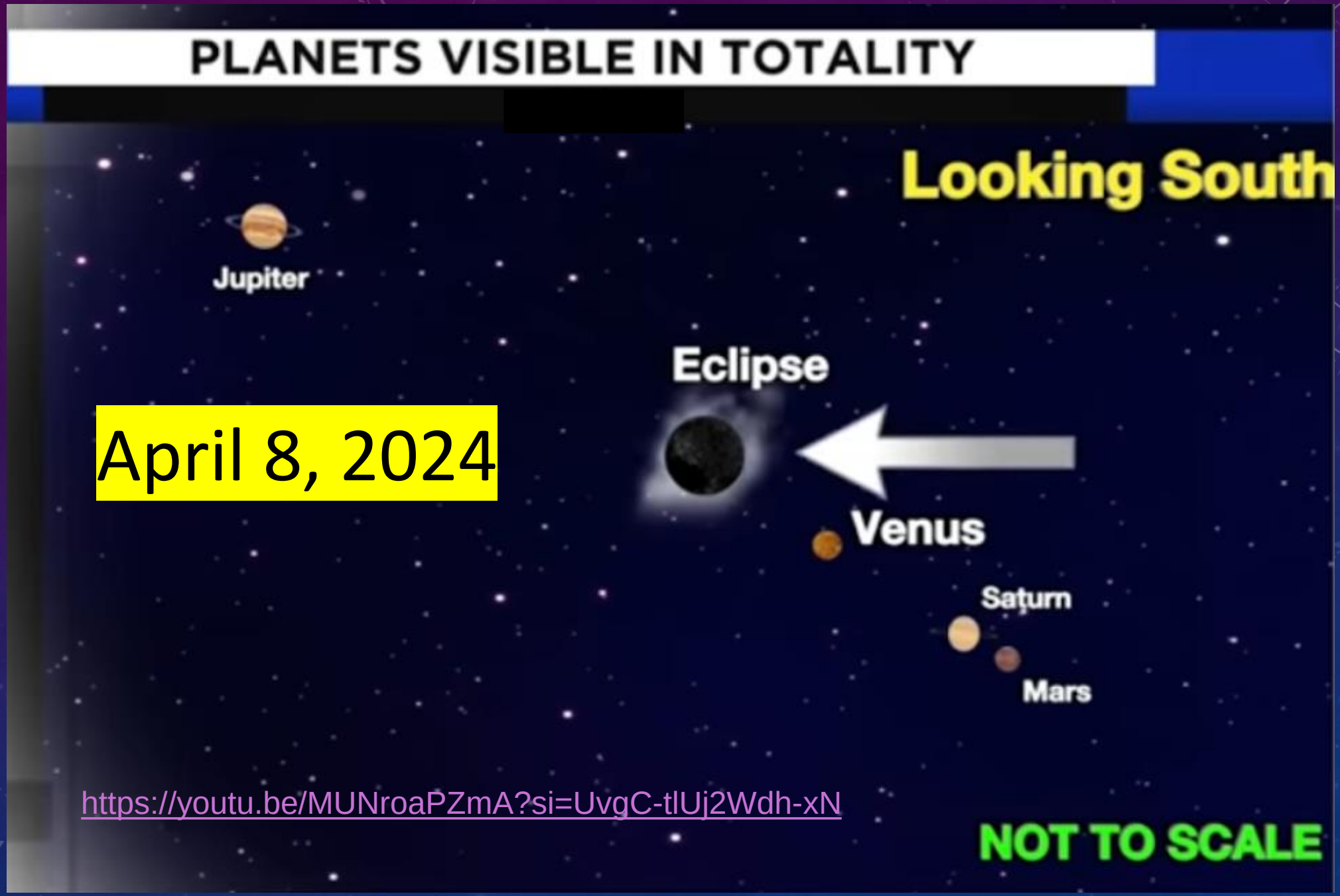
Baily's beads photographed 4 seconds before totality of the solar eclipse of August 21, 2017
Lunar topography has considerable relief because of the presence of mountains, craters, valleys and other topographical features. The irregularities of the lunar limb profile (the "edge" of the Moon, as seen from a distance) are known accurately from observations of grazing occultations of stars. Astronomers thus have a fairly good idea which mountains and valleys will cause the beads to appear in advance of the eclipse. While Baily's beads are seen briefly for a few seconds at the center of the eclipse path, their duration is maximized near the edges of the path of the umbra, lasting around 90 seconds.

It is not safe to view Baily's beads or the diamond ring effect without proper eye protection because in both cases the photosphere is still visible. https://en.m.wikipedia.org

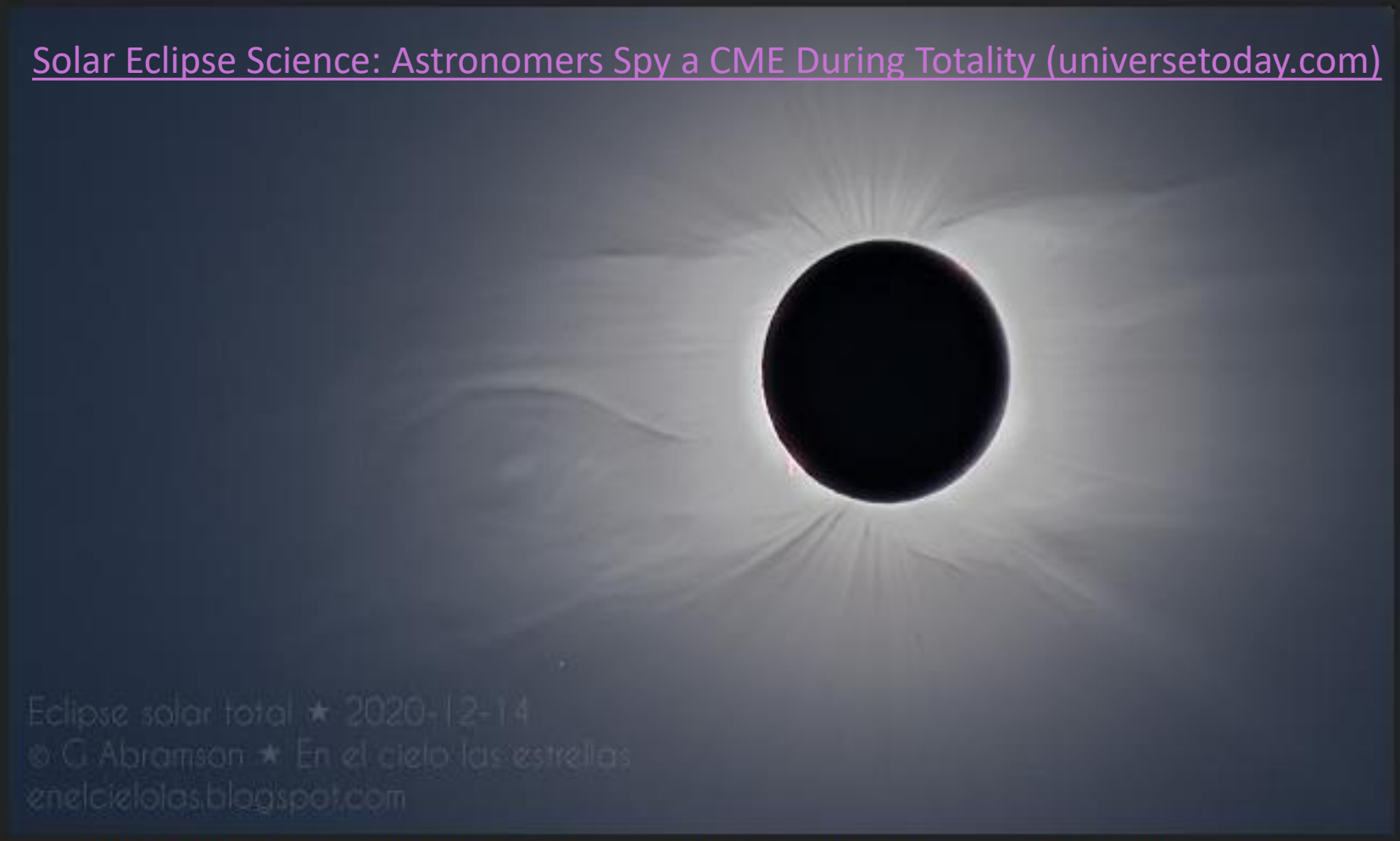
DIAMOND RING WITH BAILY'S BEADS






PLANETS VISIBLE IN TOTALITY
Looking South
Jupiter
Eclipse
April 8, 2024
Venus
Saturn
Mars
https://youtu.be/MUNroaPZmA?si=UvgC-tlUj2Wdh-xN
NOT TO SCALE

Solar Eclipse Science: Astronomers Spy a CME During Totality (universetoday.com)

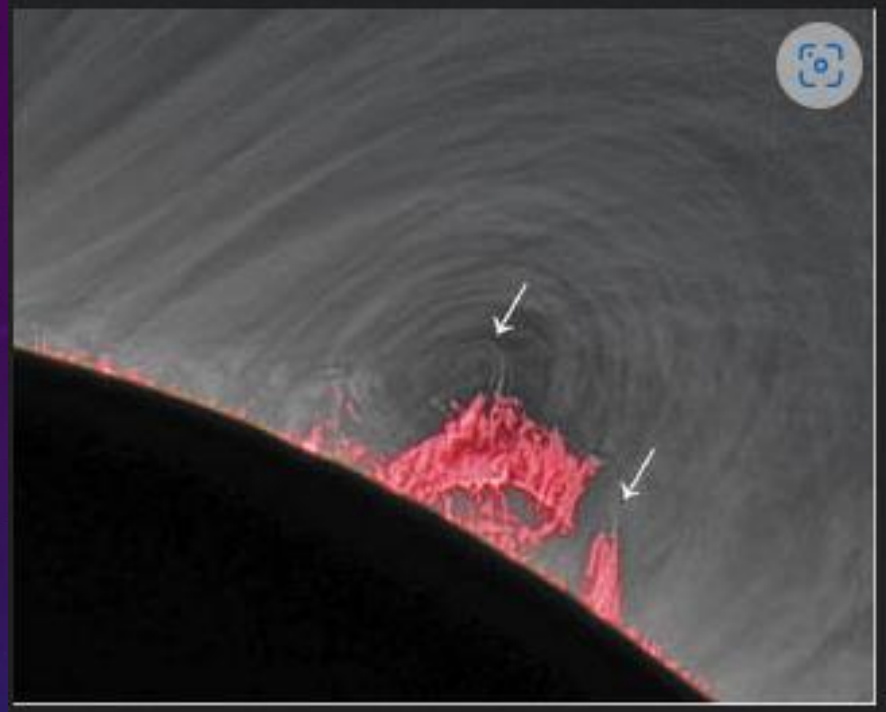


An evolving CME, as seen in the loop to the lower left of the eclipsed Sun. Credit: G. Abramson.

"Observations of the solar corona during eclipses, though rare, are extremely valuable and complementary to those made with coronagraphs, from ground and space," Abramson told *Universe Today*. "The main reason is that the corona can be observed right to the solar limb during eclipses, while the coronagraphs' masks tend to be larger."

This is a composite of Bob’s photos
He took multiple photos and assembled in post processing.

Solar Eclipse Science: Astronomers Spy a CME During Totality (universetoday.com)



Solar prominences (arrowed) interacting with the corona as seen during totality. Credit: Habbal et al. 2021.

This intriguing find was published in *Astrophysical Journal Letters*. One solar heating suspect are what's known as *nanoflares*, and missions such as NASA's Parker Solar Probe and ESA's Solar Orbiter are currently hard at work on this problem.

This was my second camera with a wide angle lens with the solar filter that was attached to my lens with gaff tape. The gaff tape was attached to my regular filter holder. When Totality began, I just removed the filter holder. When Totality ended, I just slid the filter holder back on.

I guess the food manufacturers wanted to get into the Eclipse event also.

T-Shirts for Sale on line for those of you that saw the 2017 and will see the April eclipse

Totality is totally worth it!

INTERESTING FACTS

East Coast begins approx. EDT 3:00

The speed of the moon's Shadow is 1600 miles per hour in Mexico 2500 miles per hour in New York 2900 miles per hour in Maine and 4500 miles per hour in Newfoundland

The width of the path of Totality is 117 miles

Connecticut will see 90% to 94% of Totality

The longest duration is in Nazas, Mexico with a duration of 4:28:13 minutes.

This is a photo that a camper at our campground sent to me to show our setup. He added the text to his image before sending it to me. You can see my 500 mm lens above my head with white fabric attached (to my left). My wide angle lens was to my right. My husband Bob was hidden behind my long lens with his two camera setups.

DOT’s biggest advice for viewing Totality is:

“Arrive Early and Stay Late”

Practice practice practice – practice photographing the moon at night without the filter

Practice practice practice - practice photographing the sun during the day WITH the filter

Totality is the only time to remove the filter and put it on before and after

Must use a filter for any camera, binoculars, cell phones, and your eyes BEFORE AND AFTER TOTALITY

The filter MUST BE ON THE SIDE CLOSEST TO THE SUN. Cannot use an internal filter inside of a long lens.

Totality is such a short time that you don’t have time to practice and readjust. You need to be ready quickly.

The sun/moon at totality will move quickly across the sky that you cannot just set your camera on continuous shooting and walk away. You will need to move the camera to follow the sun/moon or you won’t get good results because your subject will move right out of your image. You won’t want to be spending time adjusting your camera while totality is happening.

Don’t forget to look at the eclipse without the camera. Enjoy the event. You will feel the temperature drop, hear crickets and you will have an eerie feeling.

The inner black circle, the umbra, is where the shadow is complete — a total eclipse of the Sun. The outer shadow circle, the penumbra, shows the extent of the partial eclipse. The partial eclipse will be slightly near the outer circle and deep near the path of totality. In a deep partial eclipse, the sky will cool and sunlight will take on an eerie quality. Try to get inside the path of totality! 99% is not the same as 100%. You will only see the corona when you are at 100% eclipse; inside the path of totality.

SEQUENCE OF WHAT YOU WILL SEE

Observers in the path of totality of a solar eclipse see first a gradual covering of the Sun by the lunar silhouette for just a small duration of time from around one minute to four minutes, followed by the diamond ring effect (visible without filters) as the last bit of photosphere disappears. As the burst of light from the ring fades, Baily's beads appear as the last bits of the bright photosphere shine through valleys aligned at the edge of the Moon. As the Baily's beads disappear behind the advancing lunar edge (the beads also reappear at the end of totality), a thin reddish edge called the chromosphere (the Greek *chrōma* meaning "color") appears. Though the reddish hydrogen radiation is most visible to the unaided eye, the chromosphere also emits thousands of additional spectral lines.
https://en.m.wikipedia.org

VERY GOOD LOCATIONS TO BUY SOLAR FILTER SUPPLIES

https://www.bhphotovideo.com/find/shared/nycSuperStore.jsp

Thousand Oaks Optical,
Box 4813, Thousand Oaks, CA, 93012
[t] 805.491.3642
www.thousandoaksoptical.com

https://www.highpointscientific.com/telescope-accessories/astro-photography/astronomy-cameras

Some good links

Good video that shows a map of planets visible,
https://youtu.be/MUNroaPZmA?si=UvgC-tlUj2Wdh-xN

https://youtu.be/fmtGqOxxmEU
NASA video

https://svs.gsfc.nasa.gov/5073
printable maps

Go to NASA website is Soho Space Weather - to see today's viewing of the sun.
https://soho.nascom.nasa.gov/spaceweather/

Most importantly do not look at the sun without your eclipse glasses or filters EXCEPT for during Totality

Do not look thru your camera without the filters on EXCEPT for during Totality.

Thank you for your attention and please enjoy the eclipse.