Shooting the Total Solar Eclipse April 8, 2024

Presented by Cindy Breneman

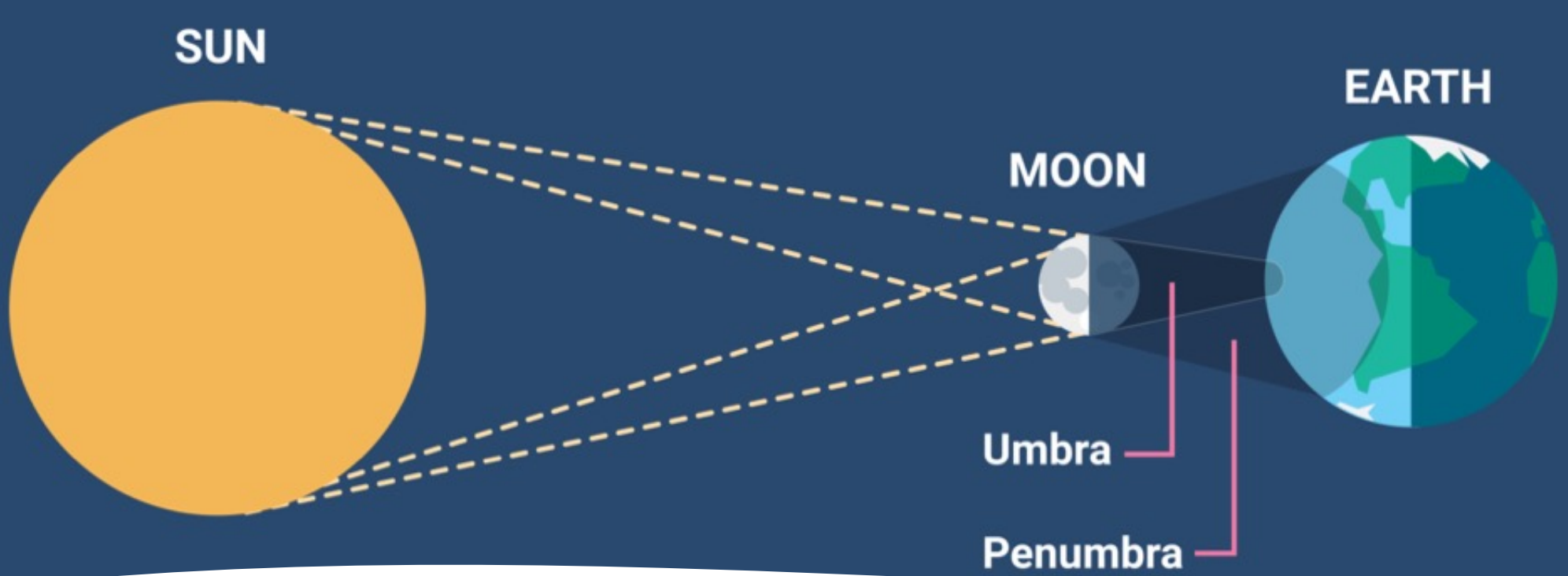
What we will cover:

- Planning the day
- Gear
- Apps
- Settings
- Day of the Shoot
- Tips
- What I learned from October 14, 2023
- Resources

Note: While I will briefly discuss other options, this presentation is directed towards photographing still shots.

Introduction:

- The April eclipse is the first total eclipse in North America since August 21, 2017 and last until March 30, 2033 (in Alaska). The next eclipses in the 48 contiguous states won't be until 2044 & 2045.
- The path will travel from Mexico, crossing the US from Texas to Maine and then into parts of Canada.
- You must be in the path of the Umbral shadow to see the total eclipse, outside of the path you will only see a partial eclipse.
- There are a lot of factors that determine the duration of the eclipse, however the closer you are to the center of the path, the longer the duration of the eclipse.



- An eclipse occurs when the Moon passes between the Earth and the Sun thereby blocking the view of the Sun from a small part of the Earth.
- To see a total eclipse you must be in the Umbral shadow of the moon.
- If you are in the Penumbral shadow of the moon, you will see a partial eclipse.
- Eclipses can be Partial, Annular (Ring of Fire), or Total
- Always happens during a New Moon

April 8, 2024

- Central Indiana falls within the Umbral path of the moon on April 8, 2024
- The path of totality runs from Evansville to just east of Fort Wayne, entering southwest Indiana at 3:01 p.m. EDT/2:01 p.m. CDT and exiting to the northeast at 3:12 p.m. EDT/2:12 p.m. CDT
- Most of the state will have about 3m 45s of Totality
- Vincennes will have the maximum length of Totality, lasting 4m 5s
- Bloomington will have around 4m 3s of Totality
- Indianapolis will have around 3m 49s of Totality

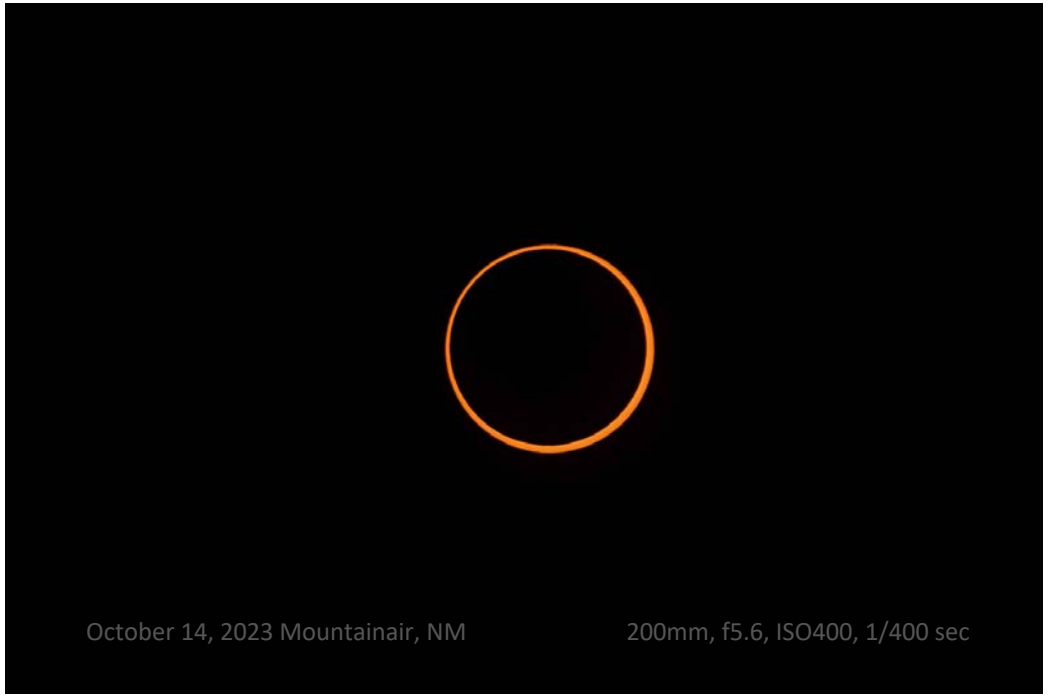
Eclipse Path

Partial and Annular Eclipse

Partial Eclipse: An eclipse where only a portion of the Sun is obscured

October 14, 2023 Mountainair, NM 270mm, f7.1, ISO400, 1/100sec

Annular Eclipse: An eclipse where the Moon doesn't totally obscure the Sun



October 14, 2023 Mountainair, NM 200mm, f5.6, ISO400, 1/400 sec

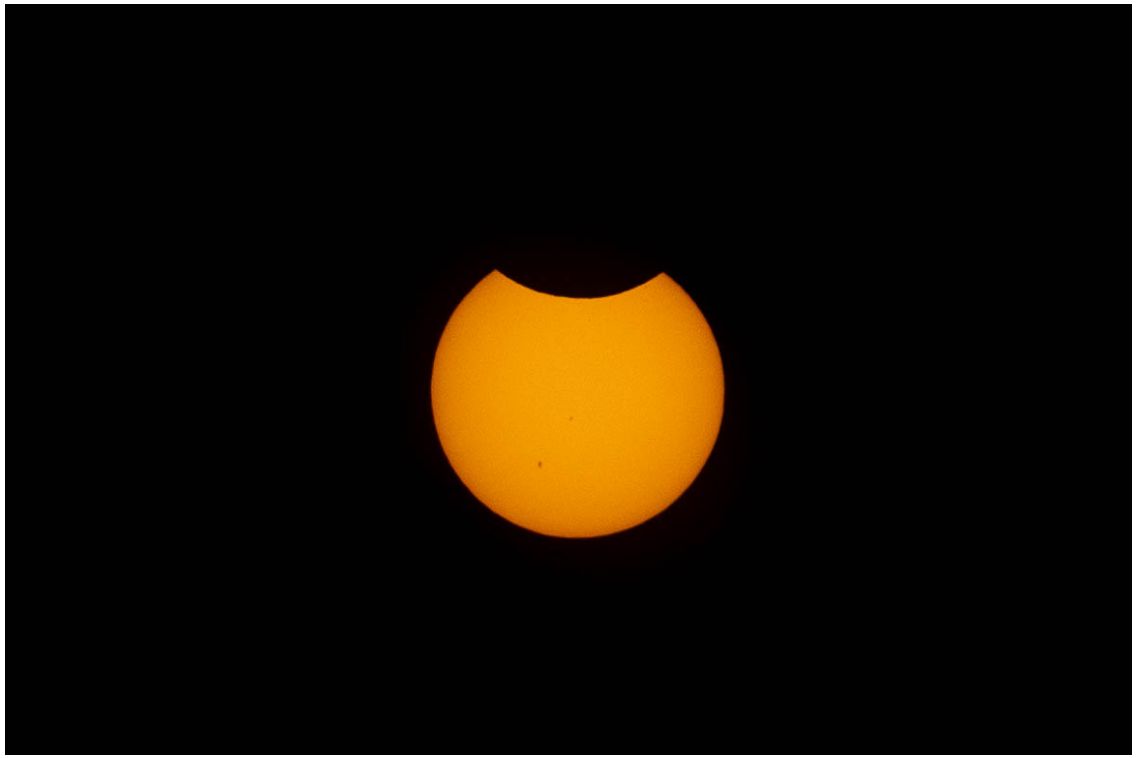
The Sun at Totality:

- We can’t normally see the corona – the Sun’s outer atmosphere – because the Sun’s surface below it is so much brighter. But during a total solar eclipse, the corona becomes visible.
- You will only see this if you are in the path of Totality

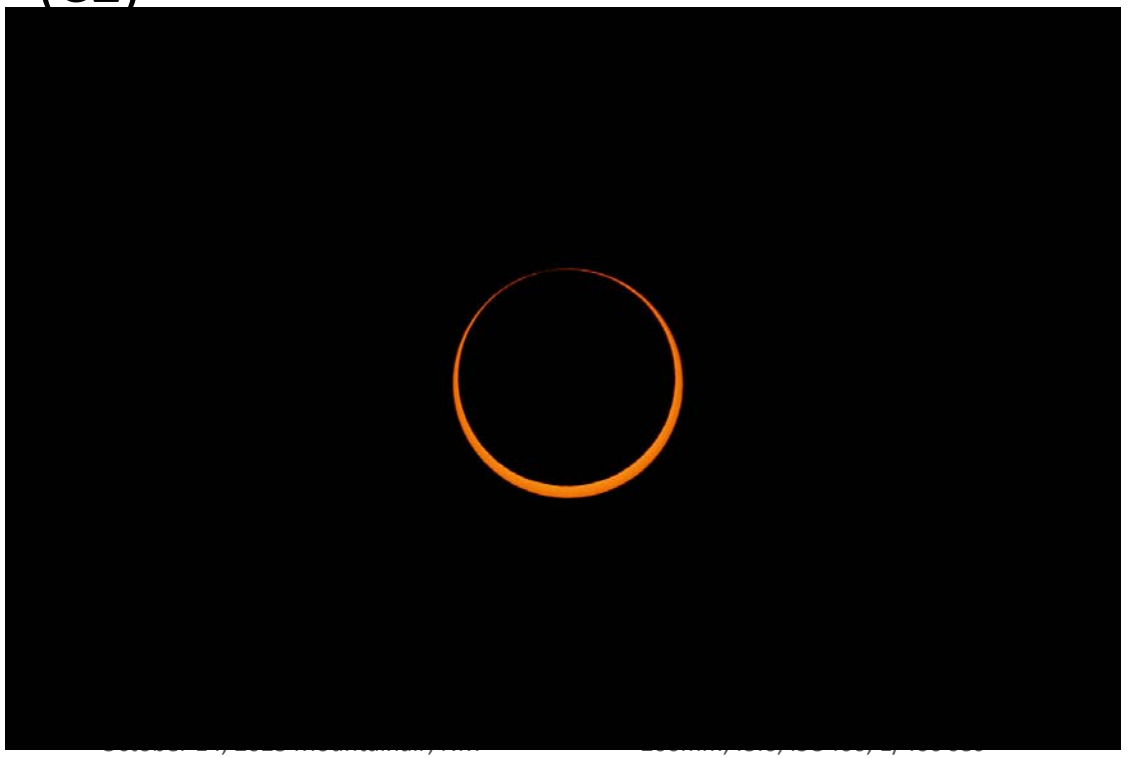
Photo Credit: Dennis DiCicco

Terminology

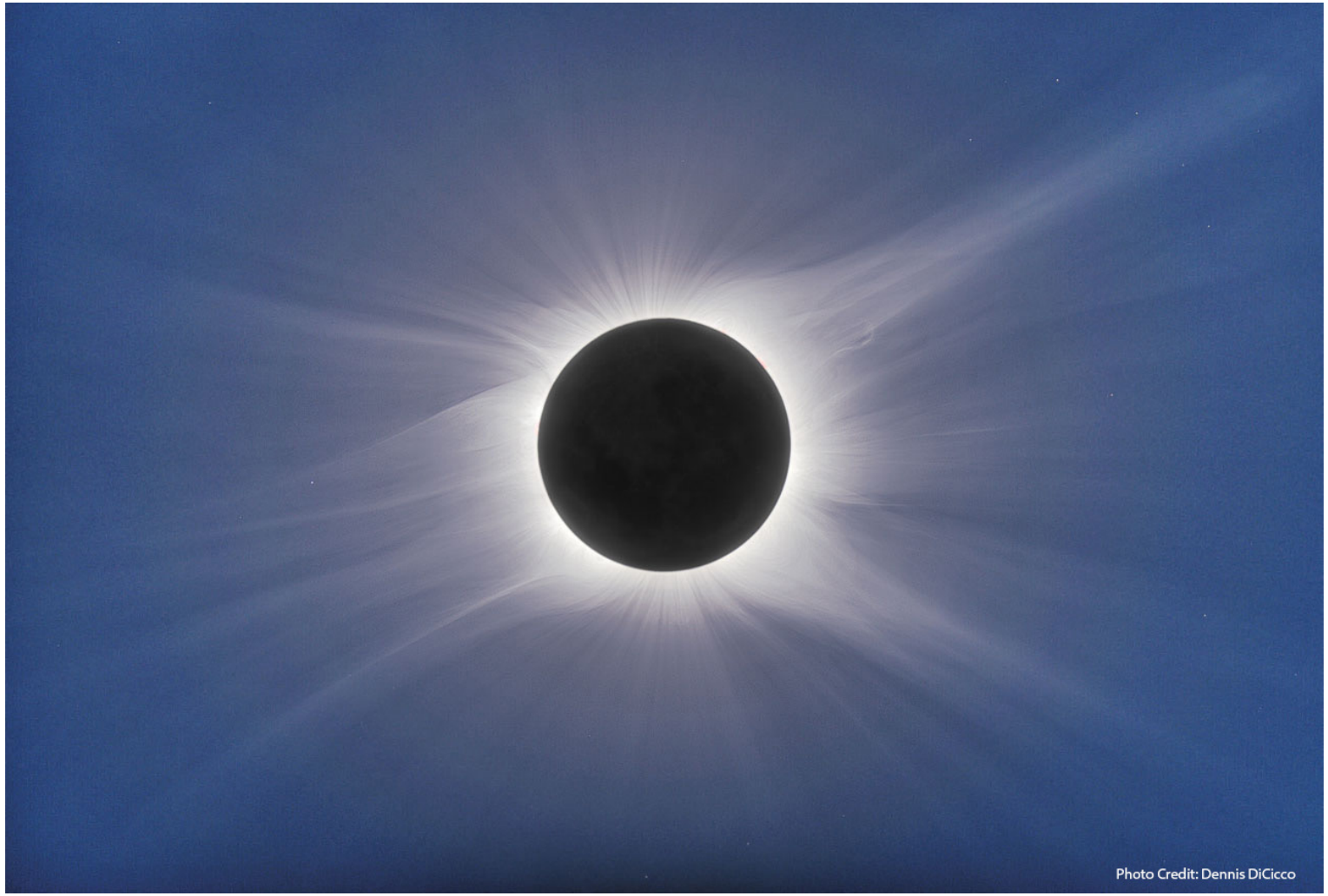
First Contact (C1) –when the eclipse begins



Second Contact: Beginning of Totality (C2)



Totality-when the moon completely covers the Sun and the Corona (outer atmosphere of the Sun) is visible



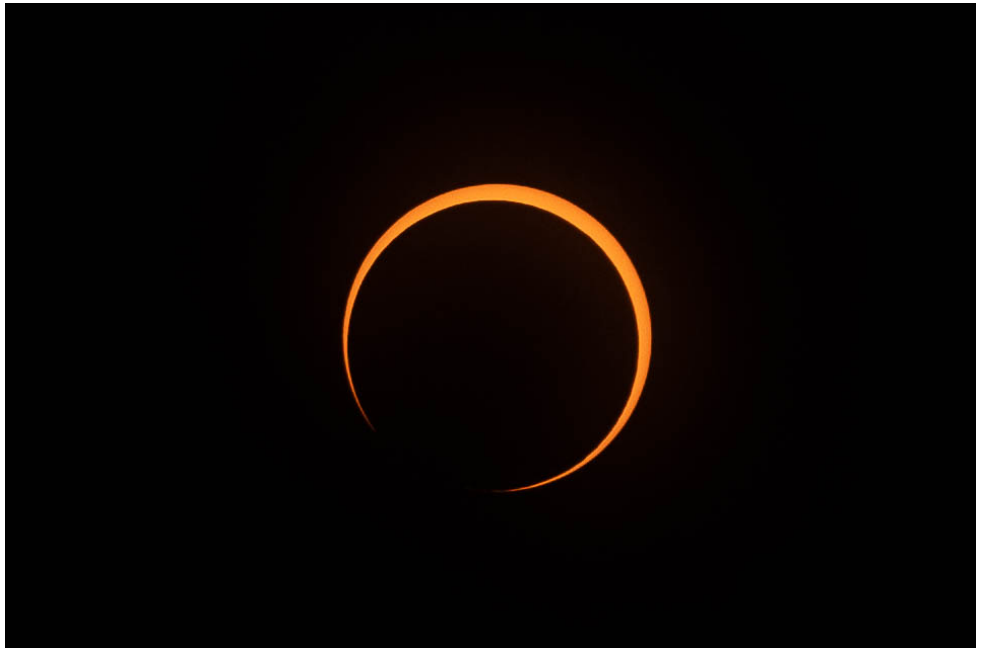
Diamond Ring & Baily's Beads

Diamond Ring Effect - single bright spot that remains on the Moon's surface just before totality.

Baily's Beads - points of light around the edges of the Moon, caused by the sun's light rays beaming through the valleys on the horizon of the Moon

Terminology

Third Contact (C3): End of Totality



October 14, 2023 Mountainair, NM 270mm, f7.1, ISO400, 1/100sec

Fourth Contact (C4): End of Eclipse

October 14, 2023 Mountainair, NM 200mm, f5.6, ISO400, 1/400 sec

Stages of the Eclipse

- First Contact
- Second Contact
- Diamond Ring
- Baily's Beads
- Totality
- Baily's Beads
- Diamond Ring
- Third Contact
- Fourth Contact

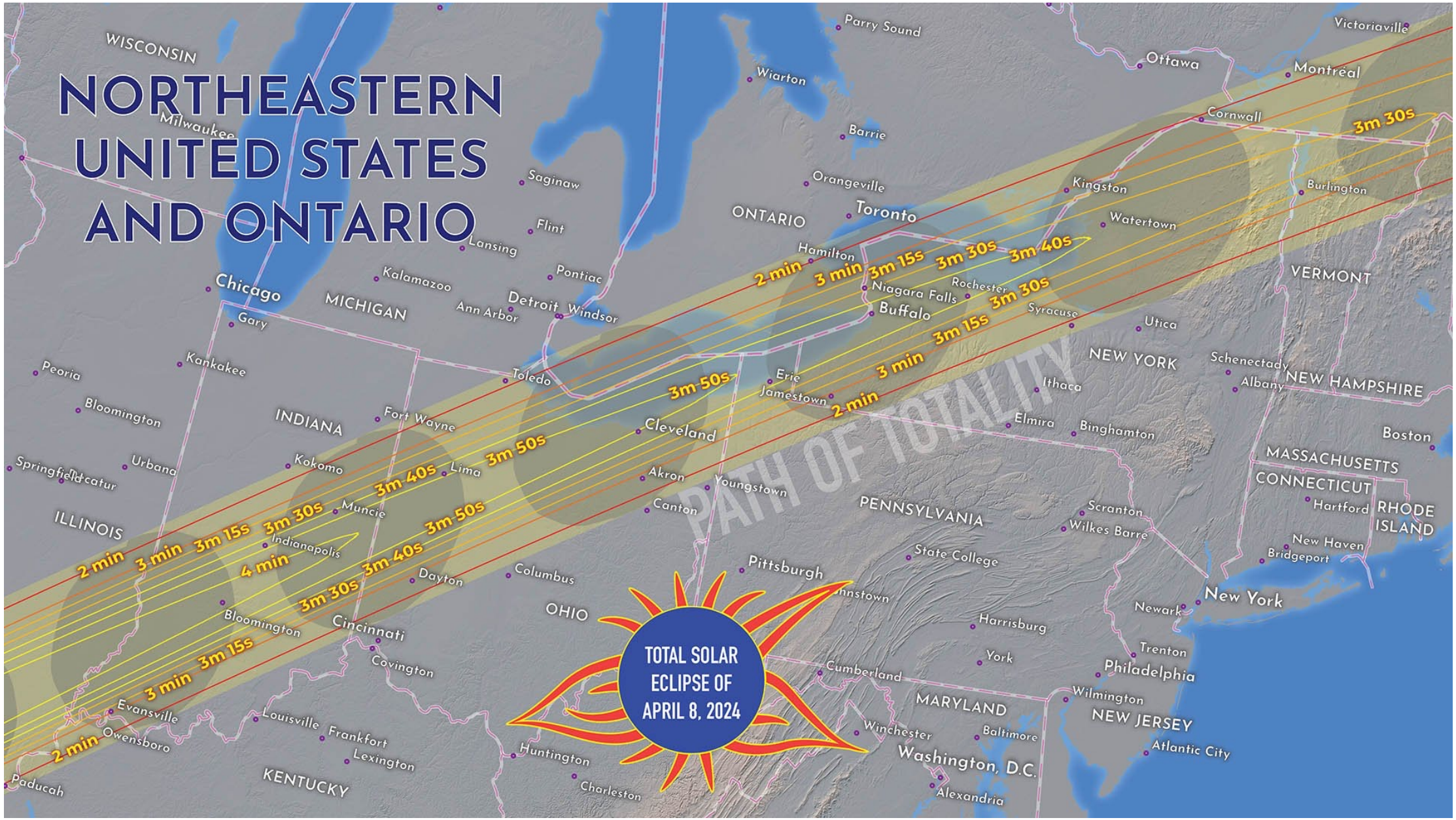
Planning: The what, where, when and how

- Planning and timing are important!
- Things you need to consider:
  - What type of shots are you planning to take?
  - Will you be shooting the eclipse in its entirety or just portions of the eclipse?
  - What is your location?
  - What time does the eclipse begin and end at that location? When does totality begin and end?
  - What will the weather be like?
  - What gear will you need?

Scouting a Location

- Make sure you have a full view of the sky.
- Know the path of the Sun. Stellarium (free desktop download) is a great tool to help you visualize what you will be seeing that day.
- Be cognizant of dusk to dawn lights. If you're going to a location near you, check to see what lights you'll be encountering at Totality. This will be more of an issue if you are shooting wide angle shots.
- You can use apps like Google Maps, Photopills or Planit Pro to help you find a suitable location
- Make sure you're in a safe location

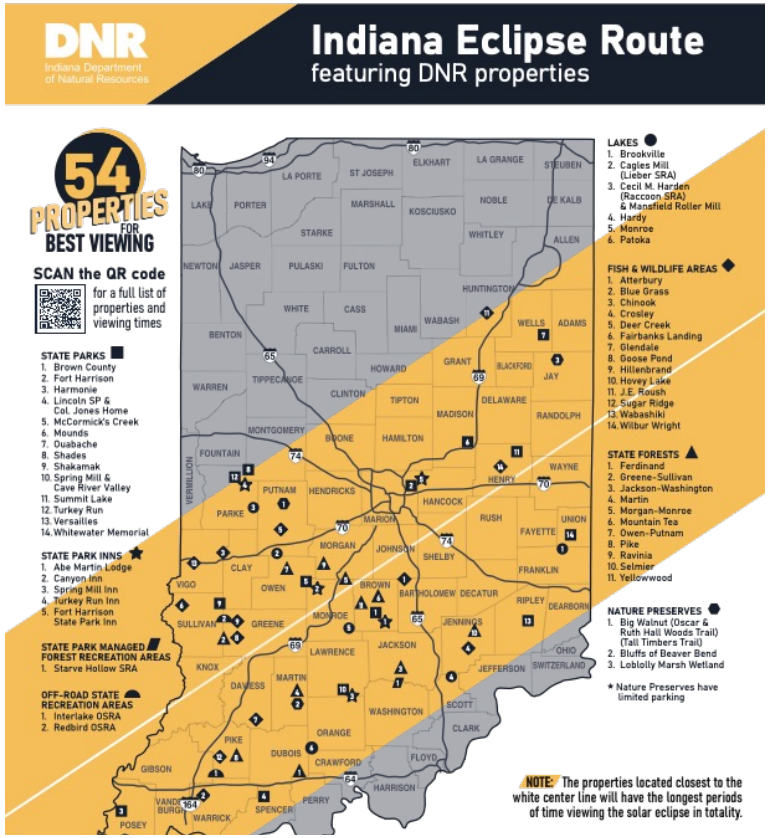
Central Indiana is in the path of Totality


NORTHEASTERN UNITED STATES AND ONTARIO
TOTAL SOLAR ECLIPSE OF APRIL 8, 2024
PATH OF TOTALITY
WISCONSIN
Milwaukee
Chicago
Gary
MICHIGAN
Kalamazoo
Saginaw
Flint
Lansing
Pontiac
Detroit
Ann Arbor
Windsor
Kankakee
Peoria
Bloomington
INDIANA
Fort Wayne
Toledo
Kokomo
Urbana
Springfield
Decatur
ILLINOIS
Muncie
Indianapolis
Dayton
Columbus
Cincinnati
Bloomington
Covington
Evansville
Owensboro
Louisville
Frankfort
Lexington
KENTUCKY
Paducah
Huntington
Charleston
OHIO
Cleveland
Akron
Canton
Youngstown
Erie
Jamestown
Buffalo
Niagara Falls
Rochester
Syracuse
Utica
Ithaca
Elmira
Binghamton
NEW YORK
Pittsburgh
Johnstown
State College
PENNSYLVANIA
Scranton
Wilkes Barre
Harrisburg
York
Cumberland
MARYLAND
Baltimore
Washington, D.C.
Alexandria
Winchester
Wilmington
Trenton
Philadelphia
NEW JERSEY
Atlantic City
Newark
New York
Schenectady
Albany
VERMONT
NEW HAMPSHIRE
Boston
MASSACHUSETTS
CONNECTICUT
Hartford
RHODE ISLAND
New Haven
Bridgeport
Parry Sound
Wiarton
Barrie
Orangeville
ONTARIO
Toronto
Hamilton
Kingston
Watertown
Cornwall
Ottawa
Victoriaville
Montreal
Burlington
2 min
3 min
3m 15s
3m 30s
3m 40s
3m 50s
4 min

DNR Properties

- Numerous DNR properties are hosting events

www.in.gov/dnr/places-to-go/events/2024-solar-eclipse/2024-eclipse-events/



Eclipse Simulators

- Best simulator: https://eclipse2024.org/eclipse_cities/statemap.html

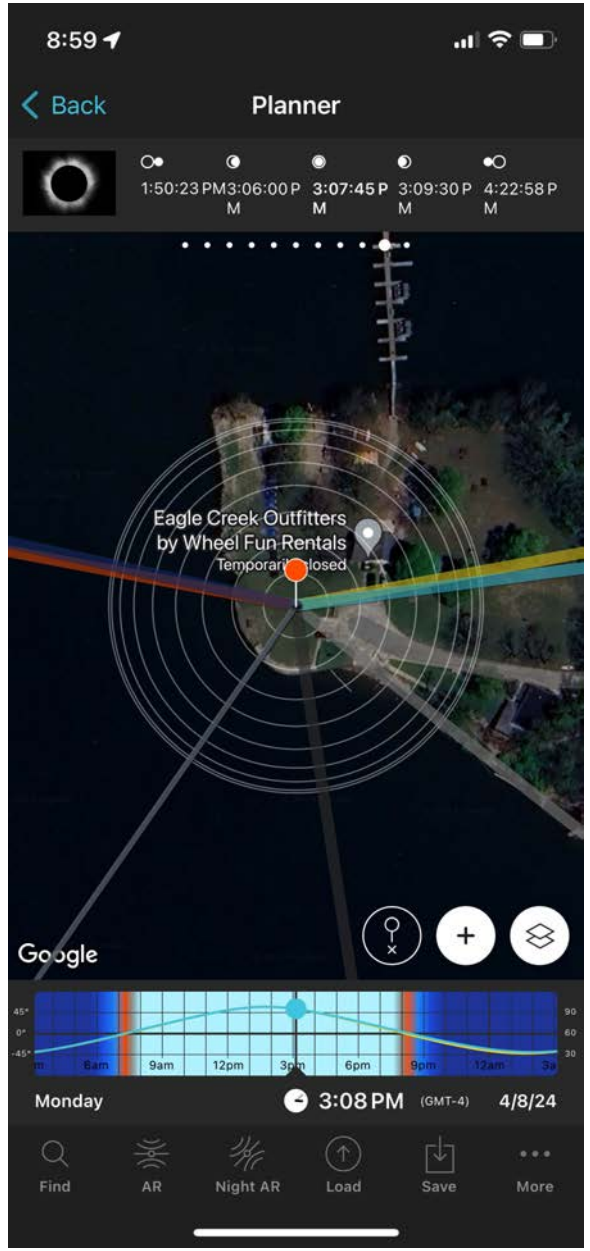
  You can enter a city and it shows the simulation, plus a running clock as well as a shadow map

- Stellarium: https://stellarium.org/

  It shows a realistic sky in 3D, just like what you see with the naked eye, binoculars or a telescope. I recommend the desktop version.

Helpful Apps

- Photopills can help you plan your location.
- Use the Eclipse feature in the Planner to get the times for your location, and find the location of the sun at the different phases
- Planner AR will allow you see the path of the Sun
- The Sun/Moon panel in the planner will also list the altitude and azimuth of the Sun



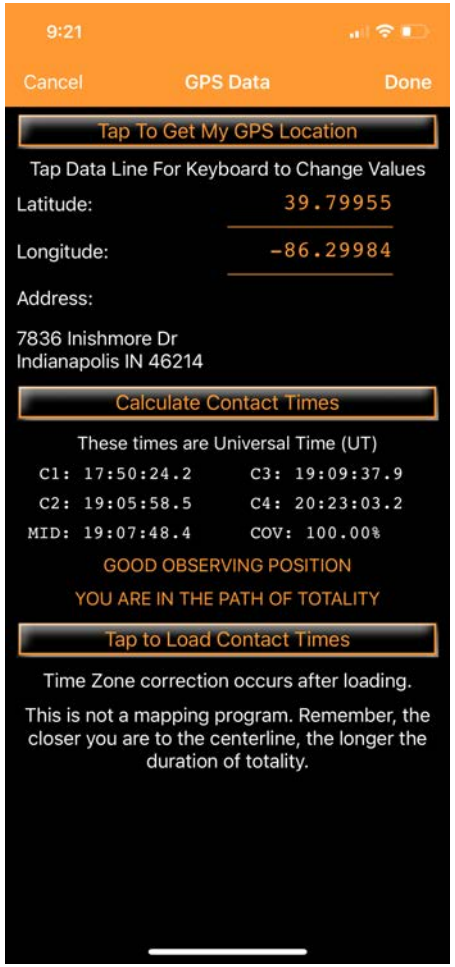
Helpful Apps

Solar Eclipse Timer (SET) –App designed to call out notifications of the different phases to walk you through shooting the eclipse based on your GPS location.

Use a dedicated device for the app, not a phone you're using for photos , I'm planning to run my on my iPad.

Features:

Eclipse Video Practice Session



Timing the Eclipse

Use Photopills or Solar Eclipse Timer app to determine the contact times & verify once you're on location on Eclipse Day

At this latitude, the Sun will move almost horizontally across the sky during the 3 hour time frame

The Sun moves it's full diameter every 2 ½ minutes-keep this in mind when setting your intervals

The Movement of the Sun

- Since the Sun will travel its own diameter in about 2.5 minutes. The movement of the Earth will carry it 15° every 60 minutes.
- The 3 hour duration of the eclipse the Sun equals about 45° of movement
- The longer your focal length, the shorter your shutter speed will need to be to prevent blurring of the Moon and Corona due to the movement

Photography Gear:

- DSLR or mirrorless camera (need to be able to have a fixed focal length, use manual focus & exposure, allow for a solar filter to attach to the end of the lens & be able to be triggered remotely)
- Wide angle (15-35mm FF) or telephoto lens (400-600mm)
  - Consider using an extender/teleconverter
  - Crop sensor cameras have an advantage here
  - Be sure to account for the corona during totality & don’t zoom in too tight
- Sturdy tripod with geared or ball head & mounting plates
- Solar Filter (do NOT use stacked ND filters or polarizing filters which do not filter out harmful IR and UV radiation)
- Intervalometer or shutter release recommended & extra batteries
- Extra memory card(s) and fully charged batteries

Other Gear:

- Small flashlight or head lamp(white light only). I like to use a small pen light rather than a headlamp so I don't interfere with other people's photos
- Chair, drinks and snacks. It can be a long day, especially if you're traveling and traffic in Central Indiana is projected to be heavy.
- Lens cleaning supplies
- Tools (allen/hexwrenches, screwdrivers, etc) for ALL your equipment and throw in a roll of black gaffer tape!
- Binoculars for viewing ONLY during Totality unless you have solar filters for them!
- Large black towel or other piece of fabric to cover your head to cut reflection while focusing

The most important piece of gear you need for the day!

Must meet ISO 12312-2 standards

- Need to state that they meet ISO 12312-2 standards
- Buy from reputable source (watch out for imposters)
- Make sure you have a pair for everyone in your group
- Check the lenses – don't use if they are scratched or damaged in any way
- Don't reuse glasses from 2017
- Remember: DO NOT LOOK THROUGH YOUR OPTICAL VIEWFINDER WITHOUT A SOLAR FILTER ON YOUR LENS OR SOLAR GLASSES ON YOUR EYES!!

Lens Choice

- Wide angle – include landscape along with the eclipse
  - Sun will be high in the sky at approx. 50-55 °
  - 24/35mm or wider FF
- Telephoto
  - 200mm—800mm FF
  - A teleconverter would be great but remember you will lose about 2 stops of light so compensate

Telephoto comparison:

Full Frame Camera

200mm

200mm + 2x converter

Tripod & Head

- Sturdy tripod able to hold the weight of longer lens and keep it steady as you make adjustments
- Geared or Sturdy ball head
  - Can be pointed high enough
  - Easily adjustable to recenter the Sun as it drifts through the frame
  - Geared head with altitude and azimuth adjustments work best
- As always, test!

A Word on Intervalometers:

- Test!
- Settings:
  - Long: exposure time
  - Interval: time between exposures
  - Number/Frames: how many shots do you want to take
  - Self: Delay prior to first shot (set to 0)
- Most intervalometers require you to set the interval to include the exposure time
- Use of an external intervalometer over an in camera one will preserve the cadence of shooting should you have to change the camera battery during the shoot

Filters:

- Two different types of filters: threaded and slip-on
  - Threaded: more secure but more difficult to remove during totality
  - Slip-on: easier to remove during totality
  - Universal Slip-on: universal size in nature, less secure, easier to remove during totality
- Filter materials: Black Polymer, Mylar, Metal Coated Glass
  - Mylar (may appear wrinkled but doesn't affect image quality)
- Metal-coated glass and black polymer filters result in a yellow or orange tint. Aluminized Mylar filters show a bluish sun.
- Be sure to remove any other filters on your lens such as UV or protective filters
- Thousand Oaks, Kenko, Seymour are a good source. Roberts and B&H have universal carboard filters

“Begin with the end in mind” ~Stephen Covey

- Wide-angle of the full duration could be made into a composite to show the sequence. You could add a day-light foreground.
- Take long exposure wide-angle shots at totality to show the planets and bright stars.
- Close-up shots could used as stand-alone images or be made into a sequence composite
- Taking photos for the duration of the eclipse and compiling a timelapse

Types of photos:

Technique	Gear Needed	Level of Difficulty
Quick Grab Shot	Cell Phone/Point & Shoot, Solar Filter, possibly a tripod	Easy
Wide Angle Stills	Interchangeable Lens Camera, Tripod, Solar Filter	Moderate
Wide Angle Time-Lapse	Interchangeable Lens Camera, Tripod, Solar Filter, intervalometer	More Difficult
Telephoto Stills	Interchangeable Lens Camera, Tripod, Solar Filter	More Difficult
Telephoto Time-Lapse	Interchangeable Lens Camera, Tripod, Solar Filter, Intervalometer, star tracker suggested	Difficult
Tracked Stills	Interchangeable Lens Camera, Tripod, Tracking Mount, Solar Filter	High

For this presentation I will only be discussing shooting still photos but have resources to help you if you wish to shoot more detailed images/time-lapses.

General Camera Settings:

- Shoot in RAW
- Manual shooting mode preferred but could use Aperture Priority for wide angle shots
- ISO will not change; use lowest native ISO
- Aperture f8- f16
- Spot Metering for close-up shots; evaluative for wide-angle views
- Auto WB (could set to Daylight or 5200K)
- Turn off lens stabilization
- Turn off Long Exposure Noise Reduction
- Use live view/LCD screen (set brightness to max) w/Exposure Simulation on
- Mirrorless shutter mode set to Mechanical or Elec. 1st-curtain
- Use mirror lockup on DSLR to reduce camera shake
- Make sure date and time are set to help with sorting photos later
- If your camera has an auto flash, make sure that it is turned off
- Shoot 3-5 bracketed shots

Timing the Shoot

Two options

1) Use an intervalometer

2) If you don’t have an intervalometer, you can use the provided worksheet to calculate the times of your shots using a remote shutter release

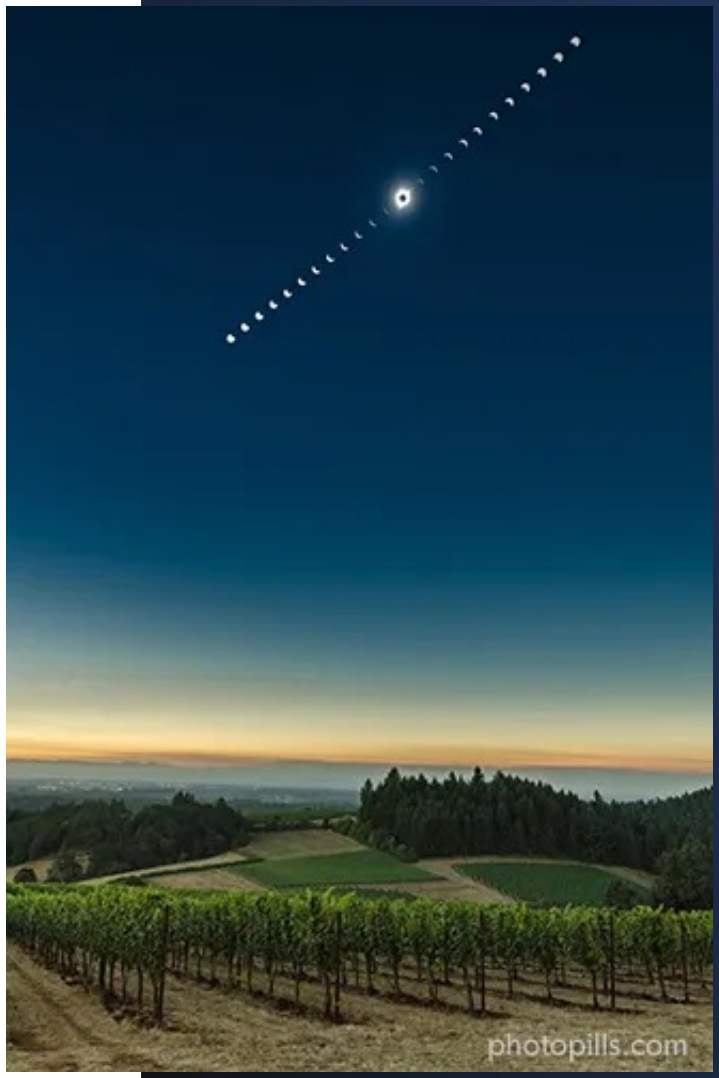
Timing the Shoot

- I like to take 1 or 2 shots prior to C1 showing the uneclipsed Sun and the same number after C4.
- Set the intervalometer to take a photo every 4-5 mintues during the partial phase period up to about 10 minutes prior to totality. At that point, you can decrease the interval time to 1-2 minutes to catch the sun crescents.
- If you want to try long exposure shots to get the bright stars and planets do so during totality
- After totality ends, don’t forget to replace the solar filter, set your intervalometer to shooting at 1-2 minutes intervals and after the crescents, increase your interval time to the previous 4-5 minute timeframe as before.

Wide-Angle Sequence Photo

This is a composite of 25 images

Nikon D7000 | 17mm | f/8 | ISO 100 | 5000K
Solar eclipse base photo: 1.3s
Partial eclipse pictures: 1/25s | Solar filter



Wide-Angle shots

- When planning your location, look for a scenic view, keeping in mind the Sun will be traveling from South to Southwest during the duration of the eclipse.
- The eclipsed Sun will be small but this may be an easier type of shot to take if you don’t have a long telephoto lens
- Advantages: camera can be set to shoot almost automatically, no reframing of shots, you can take longer exposure shots at totality that capture brighter stars and planets
- You will still need to remove your solar filter during Totality
- The challenge of this type of shot is you’ll need to determine the path the Sun will travel
- The 3 hour timeframe will equal 45° of movement across the sky, so your FOV will need to allow for that.

Settings for Wide-angle Stills

- Wide-angle shots:
  - Lighting at totality will be similar to twilight (just after sunset)
  - Can use Aperture Priority and let the camera vary the shutter with the use of an intervalometer
  - Use evaluative metering
  - Bracket your shots - 3 or 5 shots at full stop intervals.

Shutter Speed: 1/30 to 1/250	
Aperture	f5.6
ISO	100

Wide-Angle Shot Set-up

- Determine the direction of the Sun at Totality. Set your tripod up with one leg pointing toward that direction and the other two placed in the rear to split the difference
- Focus on something extremely far off in the distance without the solar filter. Set your lens to manual focus & tape it down so it doesn't move. Then put on the solar filter and check the alignment of the sun.
- A few minutes before first contact make final adjustment on camera position placing the filtered sun on the left edge of LCD screen & lock it down and don't move it.
- Once your camera location is set, take a photo w/o the solar filter to use for a foreground composite

- The Sun/Moon will be high in the sky to the S/SW.
- Jupiter will be higher in the sky to the South. Venus, Saturn and Mars will be in a diagonal going down to the West.
- Uranus and Mercury may also be visible
- 24mm lens or wider will frame this in landscape w/o Jupiter, 35mm in portrait on a FF.
- APS-C would be 14mm & 21mm.

Added Bonus…

- Comet 12P/Pons-Brooks (the Devil Comet) may be visible during the eclipse, in the southern sky near Jupiter
- Don’t take valuable time looking for them but this might be an opportunity to take a long exposure wide-angle shot of the sky and identify them later

Close-Up Images

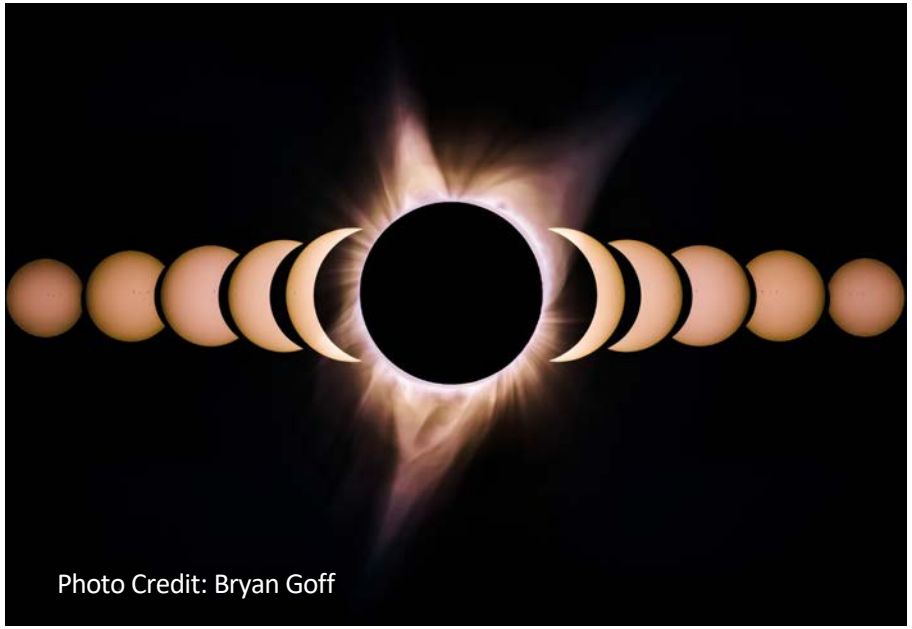


Photo Credit: Bryan Goff

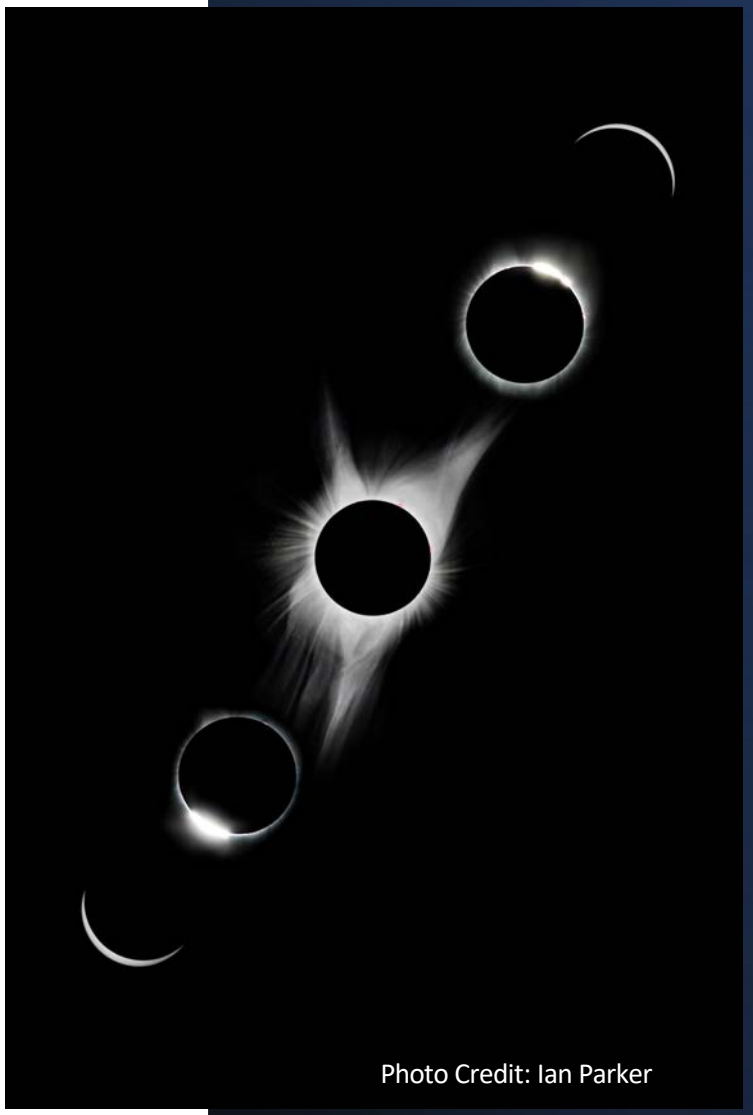


Photo Credit: Ian Parker

Close-Up Images Set-up

- Challenges:
  - Focusing
  - Keeping camera steady
  - Keeping the sun framed where you want it– you will need to monitor your LCD screen to keep sun within the frame
- Don’t extend your tripod so high that it becomes unstable. Sitting in a chair may be helpful to view your screen while focusing
- The longest coronal streamers generally run along the horizontal axis so it’s beneficial to align your camera with solar north.

Focusing

- Use manual focus
- Zoom display to 10X magnification, focus so edge of sun is sharpest or any sunspots appear sharp
- For long telephoto lenses, set your zoom lens on a wider focal length, bring to focus, zoom in a bit and refocus. Continue until you have reached desired (or max) focal length
- Recheck focus as you shoot, weather conditions can change your focus
- Don’t rely on infinity setting on your lens, it’s usually not accurate

Close-Up Partial Phase Images

- Practice a sequence of images on the full sun to determine your settings for the partial phases. Run ISO, shutter speed and aperture variations
- On Eclipse Day, shoot a bracket of 3-5 shots, one full stop apart. You will use these settings up to the last two or three shots prior to Totality and your partial phase images following Totality. Stop shooting about 2 minutes before C2
- You will need to check focus during the partial phases. Do a final refocus 5 -10 minutes prior to C2 to ensure focus for the Diamond Rings and Baily's Beads.
- Interval settings will be similar to that of wide-angle images. You will continue to take images up until 2 minutes prior to Totality.
- You will need to increase the exposure by 1/3 or 1/2 stop for the last one or two crescents before Totality and the first one or two after Totality. Bracketing can help eliminate having to change setting.
- Choose to shoot with a set interval or opt to use the Camera Chore Worksheet as discussed for wide-angle shots

Settings for Diamond Rings & Baily's Bead – Close-up Stills

- You can't look at the Diamond Rings & Baily's Beads without a filter/glasses until the last bit of the sun is gone. However, to capture the Diamond Ring & Bailey's Beads you will need to remove the filter, just keep your glasses on.
- Take the filter off when the crescent of the sun is razor thin, after you take your last crescent shot…use your LCD screen to monitor…and 40 seconds prior to C2.
- Set your shutter speed 2 to 2 ½ FULL stops faster than the setting for your full solar disk images.
- The entire sequence of going from the thin crescent to Diamond Ring to Baily's Beads takes less than 30 seconds so you will need to move fast.
- You will want to take images very quickly at this point and will not have time to vary your settings. Don't concentrate on trying to get a perfect shot, just try to get as many shots as possible using your remote shutter release.
- Start shooting the Diamond Ring phase about 30 - 40 seconds before C2

Shooting the Corona – Close-up Stills

- During Totality the Sun is 1-2 times larger on each side than the moon.
- The Corona exposures are hard to plan for because there is no way to know how bright they will be, but your shutter speed should be 2-3 FULL STOPS slower than for the Partial Phase shots.
- The inner Corona is very bright, while the outer Corona is much dimmer
- Shoot a full range of exposures (i.e. 1/1000s – 1s): using the chart as a guide. Start with the shutter speed you used for the Diamond Rings.
- You will take a shot at each shutter speed from that setting up to a few seconds

- The formula calculated by Fred Espenak for the longest exposure time is:

Exposure(sec) = 340/effective focal length

Shooting the Inner Corona

- Since Totality is going to last 3 ½-4 minutes, you may want to wait a bit before shooting your sequence so that the Moon is more evenly centered over the Sun
- Once you've completed that cycle, change your settings back for the Diamond Ring/Baily's Beads sequence and take in the wonder of the Totality
- End of Totality is easier to judge by the edge of the Moon getting brighter. Put the filter back on after the Diamond Ring ends and go back to your original settings for the crescent shots.
- You will then shoot one or two shots of the crescent shots like you did prior to Totality. After those shots, return your settings to the original settings for the partial phase images. Shoot until C4. Remembering to take an additional 1-2 full disk shots if you did so prior to C1

Exposure Settings for Close-ups

www.mreclipse.com/SEphoto/SEphoto.html

Solar Eclipse Exposure Guide

ISO		*f*/Number								
25		**1.4**	**2**	**2.8**	**4**	**5.6**	**8**	**11**	**16**	**22**
50		**2**	**2.8**	**4**	**5.6**	**8**	**11**	**16**	**22**	**32**
100		**2.8**	**4**	**5.6**	**8**	**11**	**16**	**22**	**32**	**44**
200		**4**	**5.6**	**8**	**11**	**16**	**22**	**32**	**44**	**64**
400		**5.6**	**8**	**11**	**16**	**22**	**32**	**44**	**64**	**88**
800		**8**	**11**	**16**	**22**	**32**	**44**	**64**	**88**	**128**
1600		**11**	**16**	**22**	**32**	**44**	**64**	**88**	**128**	**176**

Eclipse Feature	Q	Shutter Speed								
Partial[1] - 4.0 ND	**11**	–	–	–	1/4000	1/2000	1/1000	1/500	1/250	1/125
Partial[1] - 5.0 ND	**8**	1/4000	1/2000	1/1000	1/500	1/250	1/125	1/60	1/30	1/15
Baily's Beads[2]	**11**	–	–	–	1/4000	1/2000	1/1000	1/500	1/250	1/125
Chromosphere	**10**	–	–	1/4000	1/2000	1/1000	1/500	1/250	1/125	1/60
Prominences	**9**	–	1/4000	1/2000	1/1000	1/500	1/250	1/125	1/60	1/30
Corona - 0.1 Rs	**7**	1/2000	1/1000	1/500	1/250	1/125	1/60	1/30	1/15	1/8
Corona - 0.2 Rs[3]	**5**	1/500	1/250	1/125	1/60	1/30	1/15	1/8	1/4	1/2
Corona - 0.5 Rs	**3**	1/125	1/60	1/30	1/15	1/8	1/4	1/2	1 sec	2 sec
Corona - 1.0 Rs	**1**	1/30	1/15	1/8	1/4	1/2	1 sec	2 sec	4 sec	8 sec
Corona - 2.0 Rs	**0**	1/15	1/8	1/4	1/2	1 sec	2 sec	4 sec	8 sec	15 sec
Corona - 4.0 Rs	**-1**	1/8	1/4	1/2	1 sec	2 sec	4 sec	8 sec	15 sec	30 sec
Corona - 8.0 Rs	**-3**	1/2	1 sec	2 sec	4 sec	8 sec	15 sec	30 sec	1 min	2 min

Use the chart to determine exposure settings for Diamond Ring/Baily's Beads, and the various levels of the Corona

Timelapses:

- If you don’t have a tracker it is best done using the wide angle shooting method
- Use the same settings as for still shots
- Use Aperture Priority to allow the camera to adjust for the changing light
- Be sure to keep shutter speeds shorter than 1 second
- Shoot at 1 second intervals to have enough to create a long enough sequence to be worth while
- This will require additional post processing to create the timelapse.
  - Can be done in Lightroom, Bridge or Photoshop
  - Third-party programs such as LRTimelapse, TimeLapse DeFlicker,

Using a Star Tracker

- If it is polar aligned, it will keep the Sun centered over the duration of the eclipse.
- Benefits:

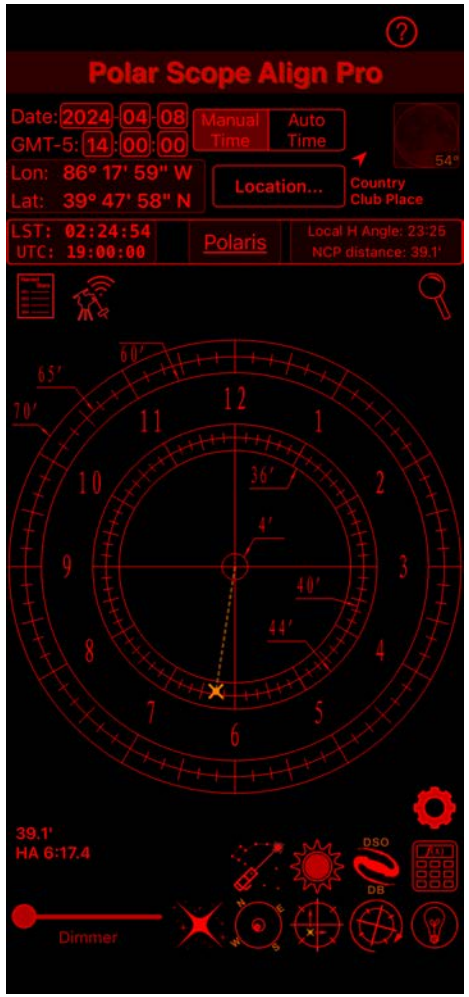
  Not having to re-position the Sun

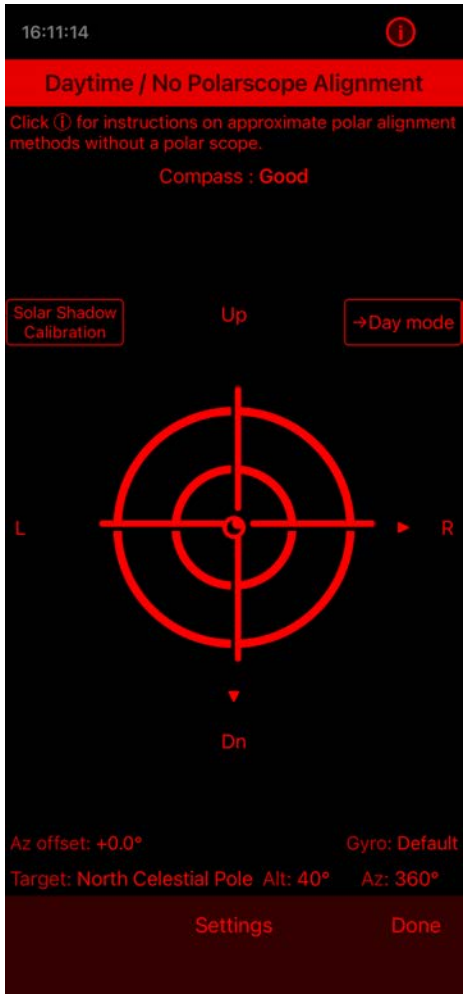
  Allows for longer exposures

  Keeps the Sun oriented in the same position in the frame for the duration of the eclipse making it easier to assemble a time-lapse of the entire eclipse
- Make sure it is rated to handle your equipment
- Check to make sure it can run free without interference with knobs, etc.

Polar Aligning a Star Tracker

- Your star tracker will need to be polar aligned with an app such as Polar Scope Align Pro (iPhone) or Polar Finder (Android) using the Daylight Alignment mode.
- Be aware that magnetic cases and the amount of metal in larger trackers can mess with the polar alignment.





Cell phone and Point & Shoot Camera

- Remember to use a solar filter or solar glasses to cover your lens
- Clean the lenses on your camera…fingerprints create hazy/blurry images
- Try using a tripod for best results with zoomed in shots
- Try shooting the partial eclipse stages by only filtering the sun
- Use to capture “B roll” photos and video of the day

Cell phone camera shot

- Solar Snap eclipse app - comes with two solar filters for phone, two pairs of eclipse glasses & Velcro dots
- App allows for exposure adjustment, focusing and zoom feature
- Also has settings for partial phase images and Totality images
- Totality setting takes a number of bracketed images
- I wasn’t overly successful with it on my iPhone 12 but that doesn’t mean it won’t work for you

Things to Observe in the Sky During the Totality

- Baily's Beads – points of light around the edges of the Moon, caused by the sun's light rays beaming through the valleys on the horizon of the Moon.
- Diamond Ring – single bright spot that remains on the Moon's surface just before totality.
- Totality – you may be able to see the corona (the Sun's solar atmosphere appearing as white streaks of light) & the chromosphere (the outer solar atmosphere which appears as a pinkish ring around the moon).
- Bright stars & planets should be easy to see
- Prominences-Large bright reddish feature extending from the Sun's surface

Things to Observe on the Ground During Totality

- Shadow bands – rapidly moving long dark bands separated by white bands that may show on buildings, sidewalks, etc. in the seconds before and after Totality. Video is the best method to capture these.
- Watch for changes in animal behavior
- Be observant of temperature changes & cloud formation or disappation
- If you can see in the distance, watch for the eclipse shadow approaching from the West and retreating to the East

Watch for crescent shadows on the ground made by small opening between leaves on trees or other objects during the partial phases

Be sure to tell the story of the day

- To tell the whole story, capture candid photos of the events of the day. What videographers consider “B” roll shots. This is great to do with your cell phone.
- People setting up telescopes
- Shadows and projected crescents on the ground
- Lunar shadow as it approaches on the western horizon, or on the eastern horizon following Totality
- People and wildlife gazing upward
- Take a Selfie
- Pano of the horizon showing the colors of the sky during Totality
- Take a video of the shadow bands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Practice, Practice, Practice!

- Practice will allow you to test your set up and find the correct settings for your camera/lens set up
- Practice will allow you to get comfortable with any new gear
- Practice on the sun with focal lengths at a fixed aperture (f8-f16) at shutter speeds from 1/1000s – 1/30s) to determine correct exposures for your set up-don’t forget your solar filter!
- Don’t overexpose the sun, lost data can’t be recovered in post! The central portion of the Sun should not be bleached out, and you should have some limb darkening.
- Currently we are having a lot of solar activity so you should see Sunspots

Practice, Practice, Practice!

- Practice on both the Sun and the Moon
- Remember that the eclipsed Sun is about the same brightness as a full moon
- If you want to try a long exposure, wide-angle shot to capture bright stars and planets practice shooting the stars in your preferred location so you know if this is possible and will know your settings. Photopills can help with this.

Practice, Practice, Practice!

- Practice every type of scenario that you might consider
- If you have the SET app, run through the practice video session at least once
- Practice removing your filter and reinstalling it
- Remember this is probably a once in a lifetime event and you don’t want to miss all of it fumbling around with your camera settings.
- Don’t forget to wear your Solar Eclipse Glasses on your practice shoots!!!

Murphy's Law- Plan for the unexpected

- Anything can happen on Eclipse day…forgotten equipment, something breaks, electrical failures, tripods get bumped and you're out of alignment, remote shutter release fails…
- Create check lists of equipment and your shooting plans
- Make sure you have extra batteries and memory cards.
- Make sure you know how to make necessary adjustments to your camera
- Be prepared for distractions
- If you expect that something may happen, you won't get as easily flustered if it does!
- Preparation and practice will help make the experience better!!

Weather or not…

- Have an alternate site plan for the day
- Monitor the weather starting one week and again 2-3 days out…adapt if necessary
- If it’s cloudy and you can’t alter your plan, see what you can get. Some clouds can add interest to your photos
- Be aware that cloud density can change quickly and you’ll need to adjust settings
- You might want to consider shooting wide-angle stills or a time-lapse movie with frames every few seconds
- The Diamond Rings can often be seen behind the clouds so be ready for that

Photo Credit: Jordon Conner

Eclipse Day

- Bring your checklists with all your settings for the different stages
- Use Photopills (or a similar app) to plan the times for stages. Make sure that you have this info for any “Plan B” sites
- Plan to get there early and allow twice as long to set up as it did for your practice sessions
- Make sure to have an accurate watch for the precise time
- Have a table or chair to put your filter on when you take it off during Totality
- Make sure to allow ample space when you set up to prevent inadvertently bumping your tripod
- Check the eclipse data for your GPS location on Photopills or SET App
- Set up tripod with one leg facing pointing in the direction of Totality– verify with Photopills AR
- Set up gear and begin working through your plan

Tips:

- While the Sun's brightness will remain constant throughout the partial phases, bracketing your shots can help if clouds or haze interfere
- If you have issues with ghosting with your solar filter, place the filter on the front of the lens at a slight angle
- Use your custom shooting modes. Set one for the Diamond Ring/Baily's Beads phase and possibly one for the thin crescent suns
- Set an alarm for two-minutes-to-go to warn you totality is imminent, or use the SET app

Tips:

- Always start with a full battery & have a spare ready. Make sure you mount your camera such that you can change your battery easily.
- If you're shooting the eclipse in it's entirety, you will need to adjust your shooting position(?) every 3-5 minutes depending on your focal length
- Keep the tension on your ball head fairly tight to minimize "losing" the sun when as you adjust
- Know your camera! Be sure you can make necessary adjustments quickly and in the dark
- Look up! Enjoy the experience, don't get so caught up in the photography that you miss the eclipse.

Tips:

- Make lists of what you need for the day. Keep in mind that the time from C1 through Totality to C4 will be 2 ½-3 hours. Roughly 1:50 -4:23 PM in Indy.
- If your camera batteries are older, consider buying a new one.
- Put fresh batteries in all accessory gear, bring power banks & charging cords for any rechargeable devices
- Check your sensor, get it cleaned if needed
- If you don’t have a remote release, know how to set your camera to shoot with a 2 sec timer.
- Be courteous to your fellow photographers. Check your camera to see if you have anything that lights up when you shoot. If so, cover it with black gaffer tape, this could interfere with photos taken during Totality.

Accessories that help

- If you don’t have an articulating LCD, a right angle viewer can help with framing the sun, but not with focus.
- A Hoodman HoodLoupe would be very helpful if you have access to one.
- APPS:
  - Solar Eclipse Timer-automatically loads the correct times for your location and provides prompts for various stages
  - Photopills-invaluable general photographer’s tool
  - Totality – free app with interactive path maps could be beneficial if you’re traveling

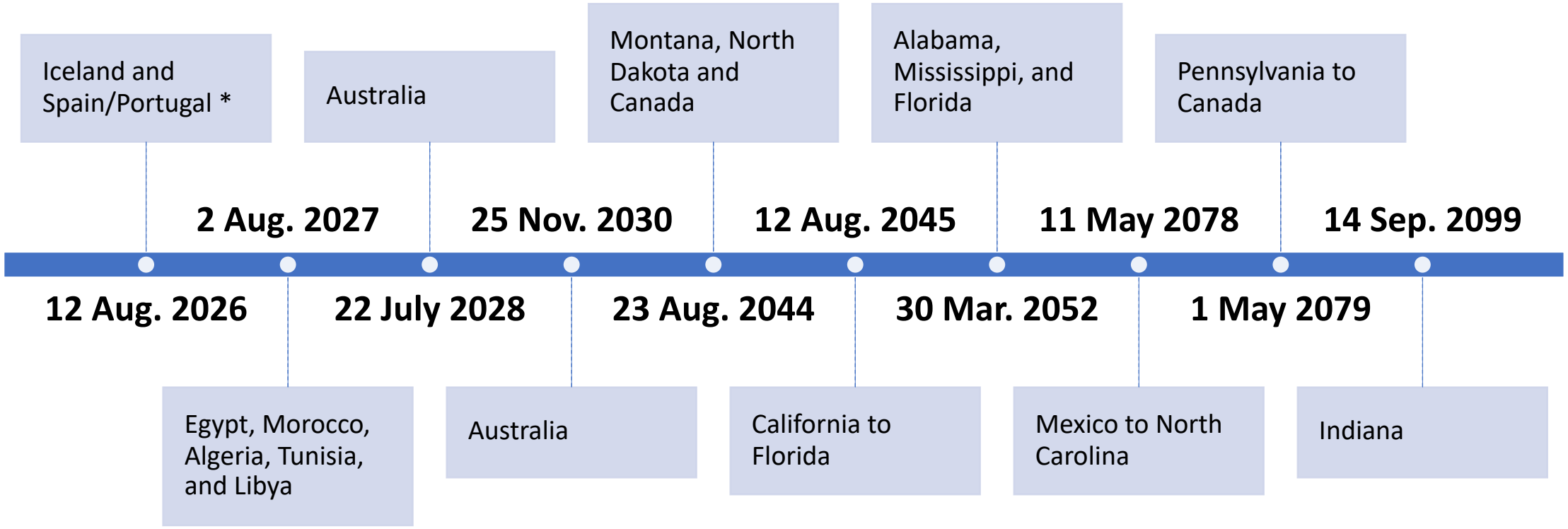
Lessons Learned/Things to do Differently

- Make sure to check focal length after making adjustments. My mistake was that I still had the 10X magnification set on on my LCD, therefore I wasn't zoomed out all the way. I also got distracted with questions from curious observers
- Not trying a wide-angle series…I didn't practice enough!

Get Creative!

- This set-up that I saw in New Mexico included a pair of binoculars with home-made solar filters. Photos were being taken with an iPod Touch and viewed on an iPad.

Future Total Eclipses



*Indiana will see partial eclipses 8/12/26, 1/14/29, 5/30/33, 6/21/39, 11/4/40

Future Annular (Ring of Fire) Eclipses

Resources

- ”How to Photograph the Solar Eclipses” by Alan Dyer
  www..amazingsky.com/EclipseBook
- “Eclipse Day: 2024 and More” by Gordon Telepun
  www.SolarEclipseTimer.com
- Fred Espanak’s site-Great information, photos and information on how to process your images
  www.MrEclipse.com
- NASA
  www.science.nasa.gov/eclipses/future-eclipses/eclipse-2024/
- Great American Eclipse
  www.GreatAmericanEclipse.com
- American Astronomical Society
  eclipse.aas.org/resources/solar-filters
- Eclipse 2024 (Simulator and so much more)
  eclipse2024.org
- Photopills Eclipse Guide
  http://static.photopills.com/ebooks/photopills-total-solar-eclipse-2024-en.pdf
- EclipseWise.com
  Lots of technical information
- eclipsophile.com/2024tse/
  Long range weather outlook
- IN DNR Eclipse Website
  www.in.gov/dnr/places-to-go/events/2024-solar-eclipse/
- INDOT Traffic website
  511IN.org

Thank you so much!

- If you have any questions please feel free to contact me:
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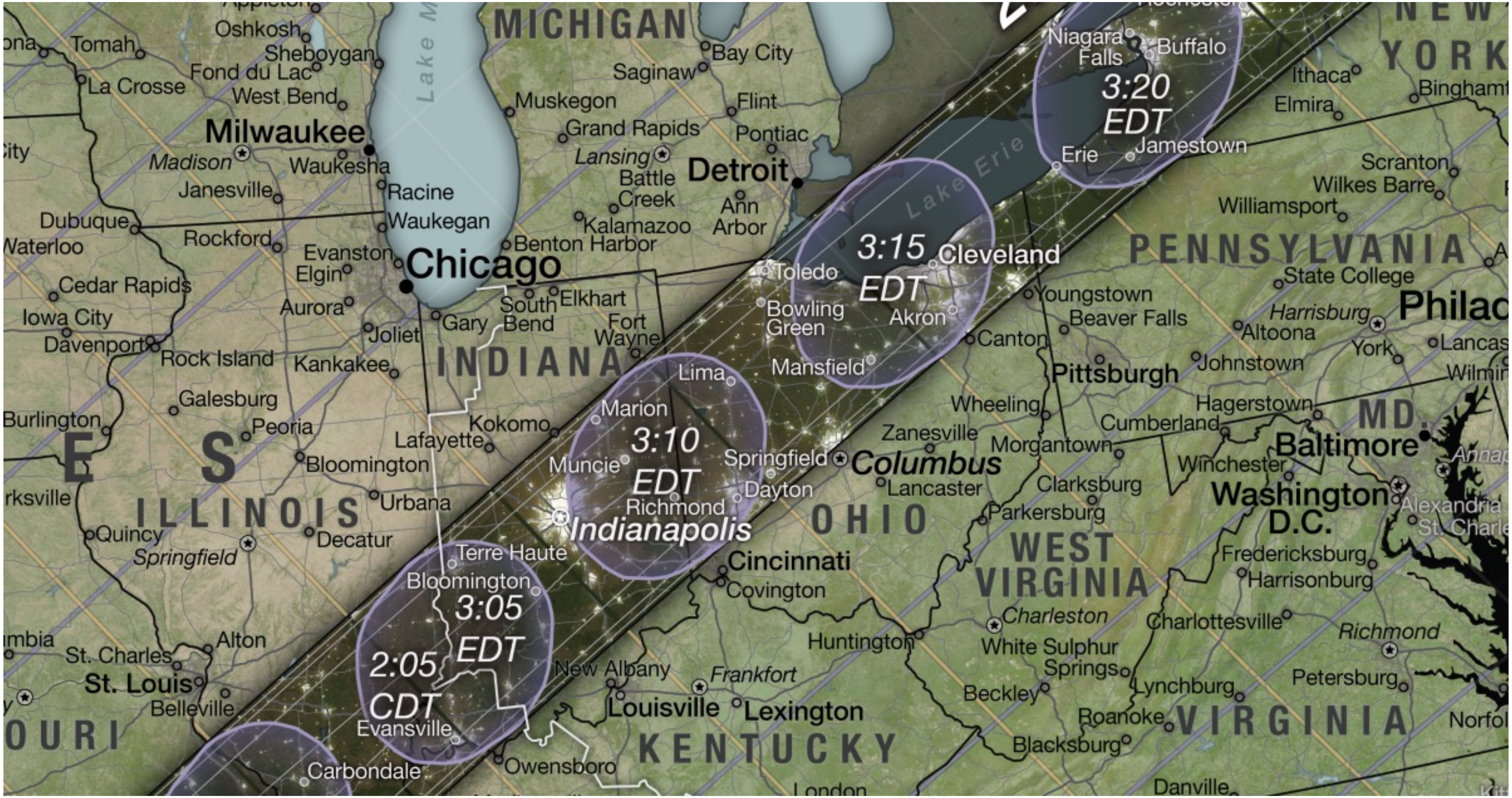
  317.442.9786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Muncie
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Owensboro
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Louisville
Frankfort
Lexington
KENTUCKY
Cincinnati
Covington
Lima
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Springfield
Dayton
Columbus
Lancaster
OHIO
Toledo
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Mansfield
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