Solar Eclipse

Guide to Photographing the April 8, 2024 Eclipse

We have an opportunity to photograph a total solar eclipse without leaving our state. Take advantage of this because it will be many years before one is this close again.

Or you may just want to enjoy it without photographing it and be just in the moment.

Apps

PhotoPills phone app $

- Can see the eclipse pathway to plan your location.
- At the location, the AR function lets you see just where in the sky it will cross.
    - Helps with avoiding obstructions.

Solar Eclipse Times app $1.99

'Totality 3.0' by Big Kid Science – Interactive map. Gives times and durations. Free

'Sky Safari' – Locations of celestial objects

Composition

Wide angle Landscape with the eclipse in a single frame or a composite of phases.

Long telephoto of the eclipse only including a close up of the sun/moon alignment.

Location

Peoria, IL partial eclipse:

coverage is 93.956%

12:47:03 pm Partial eclipse begins

2:03:50 pm Maximum partial eclipse

3:19:08 pm Partial eclipse ends

Must use solar filters for the entire eclipse.

Totality Pathway nearest Peoria IL – Indianapolis IN, Bloomington IN, Carbondale IL, Cape Geraldo, MO

It's Spring so the Midwest is prone to clouds and rain. Further west to Texas is dryer.

Search your location details here. [Total Solar Eclipse on April 8, 2024 (Great North American Eclipse) (timeanddate.com)]

Personal comfort

Your comfort needs vary with you and your environment.

- Chair
- Water
- Food/Snacks
- Hat
- Bug spray
- Sunscreen
- Restroom available
- Layered clothing

Gear

Solar filter

- Make from welder's glass. 18 stop reduction. Glass is thick, green, and not optical quality.
- Threaded or square filter. Purchased from a photo gear company. Called a ND 5.0, ND 100,000, or solar filter and may have a 14 to 18 stop reduction.
    - Screw on the front of your lens
    - Square to slide into a holder on your lens
- "Slide over lens" filter can slide over your lens.
    - A filter mounted in a paper sleeve or metal sleeve used for teltscopes.
- A threaded filter holds securely, but you need to remove it without losing your focus.
- My filter cautions that I should consult with my camera manufacturer if the camera can even be used.

Tripod– take your camera off image stabilization.

- Shutter release or
- Intervalometer
    - Suggest 5 minute interval minimum.
    - Remember during totality to remove the solar filter and change exposures.

Batteries – multiple, all charged
Memory cards - Fast, formatted, empty
Lens

- Long telephoto for eclipse, 200-300 or longer
- Big details on the corona, use 400-600 at least
- Wide angle for getting the landscape (second camera for this)

Camera setting starting points

Consult the exposure chart on page 5 for various settings. Eclipses can be different brightnesses.
Shoot in RAW
Manual exposure
Partial eclipse <u>WITH SOLAR FILTER ON</u>

- f/8 at 100 ISO, 5.0ND solar filter
- Shutter speed
    - Partial Solar Eclipse: 1/500th of a second
    - Diamond Ring: 1/250th of a second
    - Bracket exposure with shutter speed
    - Consult the exposure chart, page 5

Totality <u>REMOVE SOLAR FILTER</u>

1/25th of a second (night photography)

No solar filter (Caution: remember to put the solar filter on when sun begins to reveal again!)
Consider Shooting in burst mode at beginning and end of totality.
Bracket your shots

Focus, set to manual, and tape lens to hold focus. Focus on the Sun, then when the moon touched it, focus on the moon's edge.

Phases of the Eclipse

These are the "contact" points:

- First – C1. The moment when the Moon first "touches" the Sun
- Second – C2. Once the diamond ring disappears and there is no longer any direct sunlight

totality

- Third – C3. The first flash of sunlight appears around the edges of the Moon.
- Fourth – C4. Last kiss of contact between the sun and the Moon.

Resources

Photography

Photopills eclipse ebooklet free Solar Eclipses 2024: The Definitive Photography Guide | PhotoPills

How to Photograph a Total Solar Eclipse (mreclipse.com)

How to shoot the solar eclipse: a list of resources for photographers: Digital Photography Review (dpreview.com)

The Amateur's Ultimate Guide to Photographing the Solar Eclipse (skylum.com)

What Happens If You Photograph the Solar Eclipse Without a Filter - Thrillist

How to Take Photos of A Solar Eclipse (Gear, Settings, Tips) (expertphotography.com)

Eclipse

Apr 8, 2024 – Total Solar Eclipse in the United States (timeanddate.com)

A checklist for what to expect during the… | The Planetary Society

Great American Eclipse

Overview | 2024 Total Eclipse – NASA Solar System Exploration

20 of the best places to view the 2024 total solar eclipse (astronomy.com)

www.nasa.gov then bottom of page find "nasa+live" for a live eclipse stream.

Apps & Software | Solar Eclipse Across America (aas.org)

https://skyandtelescope.org/2024-total-solar-eclipse/eclipse-apps-books-and-more-resources-for-the-2024-total-solar-eclipse/

make your own

https://www.bhphotovideo.com/explora/photography/buying-guide/lens-filters-for-solar-photography

https://agenaastro.com/articles/guides/how-to-make-a-solar-filter-for-viewing-a-solar-eclipse

https://petapixel.com/2017/08/09/make-solar-eclipse-lens-filters-15-instead-paying-150/

https://improvephotography.com/48165/make-diy-solar-eclipse-filter-lens-2/

Random

You can see the Sun's corona only during a total solar eclipse.

Look for planets and stars during totality.

DSLR - Use live view instead of your viewfinder.

Never aim camera at the sun without a solar filter. You can burn up your sensor and your eye. Exceptions are Sunrise, sunset, and during TOTALITY ONLY in an eclipse.

The partial eclipse requires the use of a Solar Filter on the front of your lens, telescope, or binoculars and strong eye protection. The total eclipse does not need the solar filter and you can look at a total eclipse without eye protection.

The sun moves its apparent diameter every two minutes.

Order viewing glasses early as they sold out in 2017 (look for ones marked "ISO 12312-2," which is the international code that says they protect your eyes from solar rays).

Traffic jams after the eclipse ends if you are at a popular location. Many people leave after totality rather than see the partial phases as the eclipse finishes.

Its very interesting during totality as you have a 360 degree sunset. It's not just the eclipse.

The weather can affect seeing the eclipse.

The total eclipse only lasts a few minutes and varies by your exact location.

Home - 2024 Solar Eclipse (siu.edu) April 8, 2024 at 1:59pm CDT Carbondale, IL. Eclipse for 4 min 9 sec.

SIU Journey to the Eclipse Talk Series via zoom. First Friday of each month, 3pm.

Future eclipses

After 2024, the next solar eclipses visible in the contiguous United States will be Aug 22, 2044, followed by another on Aug 12, 2045. Neither is near Peoria.

After 2024, the next total solar eclipse to hit Illinois is 2111. Do you need to know the day? (Aug 4).

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

Instructions

Choose the ISO speed in the upper left column. Next, select the f/number of the lens or telescope (on same line as ISO). Finally, drop straight down to the bottom table to get the correct exposure for each feature of the solar eclipse.

Note that the brightness of the corona varies dramatically with distance from the Sun's edge. All exposure values in this guide are estimates. For best results, use them only as a guide and bracket your exposures.

Exposure Formula: $t = f^2 / (I \times 2^Q)$

where: t = exposure time (sec)
f = f/number or focal ratio
I = ISO film speed
Q = brightness exponent

Abbreviations: ND = Neutral Density Filter.
Rs = Solar Radii.

Notes: [1] Exposures for partial phases are also good for annular eclipses.
[2] Baily's Beads are extremely bright and change rapidly.
[3] This exposure also recommended for the *Diamond Ring* effect.

www.mreclipse.com/SEphoto/SEphoto.html