

The Total Solar Eclipse of 2024: Tips and Facts from your Friendly Neighborhood IU Optometrist



Image from American Astronomical Society (AAS)

What is a solar eclipse?

A solar eclipse occurs when the moon is between the sun and the Earth. The moon blocks part of the sun, casting a shadow on the Earth. Depending on the position of the moon, the alignment, and where you are on Earth, we see different types of solar eclipses.

Total solar eclipse

On Monday April 8th, 2024, there will be a total solar eclipse that can be witnessed throughout many parts of Indiana. The path of totality begins in Mexico's Pacific coast and travels across the United States and exits on the Atlantic coast of Newfoundland, Canada. Indianapolis and Bloomington are among a number of cities in the path of totality. If you are observing this eclipse outside the path of totality, you will see a partial eclipse.

Partial solar eclipse

Partial eclipses occur when the sun, moon, and Earth are not perfectly lined up. You will be outside the moon's inner shadow, so only part of the sun appears to be covered by the moon.

There will be a total solar eclipse on April 8th, 2024!

Viewing Safety

It is NEVER safe to stare directly at the uneclipsed or partially eclipsed sun without proper filters. This can temporarily or permanently damage your eyes and vision. However, it IS safe during *totality*, a short period of time during a *total solar eclipse* when the moon is completely covering the sun.

If you saved your eclipse viewer from the partial eclipse in 2023, you can reuse it! **Always check your filters for damage prior to use.** Do not use the filter if it is torn, dented, scratched, or falling apart. Make sure your filters are from a reputable source, as many fake filters are sold online. For **free viewers**, check with your local library or science museum! Commercially available welder's glass shade level 12 or higher are also safe.

For a list of **reputable vendors**, visit:

<https://eclipse.aas.org/resources/solar-filters>

Cleaning Tips for Eclipse Viewers

If you need to clean the eclipse filter, the AAS recommends using a soft, nonabrasive tissue or cloth such as a microfiber cloth or Kimwipes. DO NOT use water, glass cleaner, baby/wet wipes, or any other solvents or liquids to clean the filters.



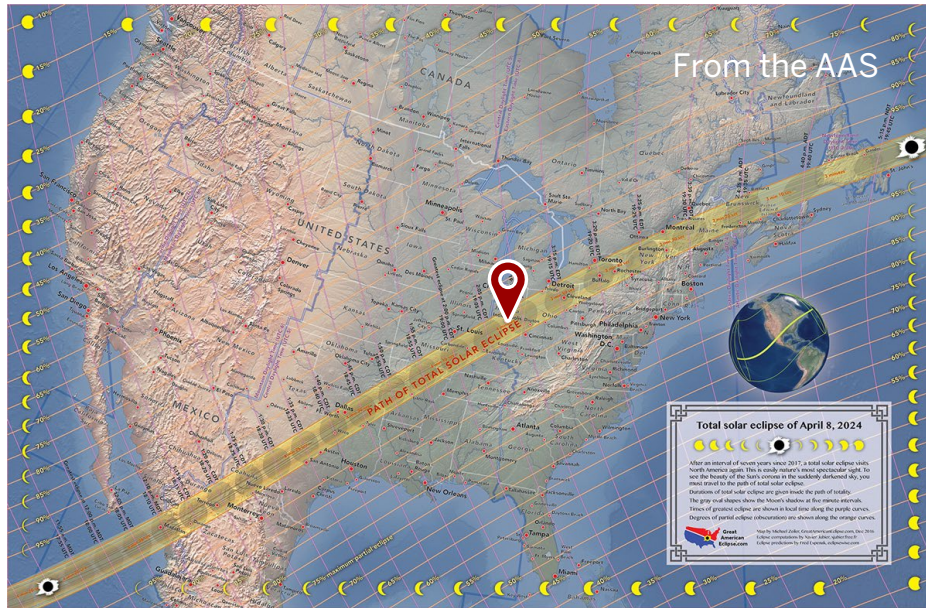
Image showing partial eclipse seen through the eclipse filter

Image from AAS



Safety Information

In many areas in the state of Indiana, we will observe a total solar eclipse on April 8th, 2024. For **direct viewing**, special eclipse viewers with *International Organization for Standardization (ISO) 12312-2 filters* are required for safely viewing during the partial phases of the eclipse. **Unsafe viewing** may cause solar retinopathy, a condition that causes temporary or permanent damage to your vision! If you are in the *path of totality*, it is safe to view the eclipse without the viewers *during totality*, which will last up to 4 minutes depending on your location. At the first sign of the sun reappearing, look away or put your viewers back on!



Check to see if your city is in the path of totality: https://eclipse2024.org/eclipse_cities/statemap.html

For **indirect viewing**, use a pinhole projector! With your back to the sun, look at the shadow cast by a pinhole onto white paper. Look only at the projected shadow! Do **NOT** look at the sun directly through the pinhole!

For ideas on a do-it-yourself pinhole projector or sun funnel, visit AAS for instructions:

<https://eclipse.aas.org/eye-safety/projection>

AAS instructions to check if your viewers are legit:

- Through the viewer, a typical bright sun should appear comfortably bright and in focus against a dark sky
- Through the viewer, you should only be able to see the sun or something comparably bright such as:
 - Sun reflected off a mirror/shiny metal
 - Bright LED (smartphone flashlight)
 - Bright bare incandescent/halogen bulb
- Through the viewer, you should **NOT** be able to see shaded lamps or household light fixtures that are not bare bulbs, if you can, these are unsafe and dangerous



Examples of unsafe filters:

- Sunglasses (or multiple pairs of them)
- Smoked glass
- Photo film negatives
- X-ray film
- Polarizing filters
- Neutral density filters
- Damaged eclipse viewers

A solar eclipse is a rare and amazing celestial event. Please enjoy it with caution! Also, don't forget to wear sunscreen and stay hydrated. If you notice discomfort to your eyes or changes to your vision after viewing the eclipse, please consult your local optometrist or ophthalmologist ASAP. For additional resources, check out these websites by NASA and the American Astronomical Society (AAS):

<https://solarsystem.nasa.gov/eclipses/safety/>

<https://eclipse.aas.org/eye-safety>

