

2024 Solar Eclipse

- April 8, 2024

Pennsylvania has the distinct privilege of once again being in the direct line of a total solar eclipse on April 8, 2024. The last time Pennsylvania was in direct line with a total eclipse was 1806. While the path is somewhat westwardly oriented in comparison to the last total eclipse, much of Pennsylvania will lie within the *paths of totality* or *partial totality*.

Astronomical events such as solar and lunar eclipses have long drawn the interest and imagination of individuals of all ages. "Once in a lifetime events" such as the total solar eclipse set to occur on April 8, 2024, have now spurred a frenzy of interest, including entrepreneurial and tourism opportunities, thanks to online and broadcast media. The next total solar eclipse that can be seen from the contiguous United States will occur in 2044.

This resource is designed to help the educational community as they plan events and communications related to the Monday, April 8, 2024, total solar eclipse event and other solar viewing opportunities.

How is this event different than other eclipses we see in Pennsylvania?

During the April 8, 2024, event, the eclipse impact across PA will range from Total (100%) to Partial Solar Eclipse (90%).

Crawford, Erie, Mercer, and Warren counties are in direct line for the path of totality or 100% magnitude.

The remainder of the state will be in the 99% to 88.65% magnitude, thus viewing precautions and the use of protective eyewear during the entire eclipse including the peak are required to prevent permanent eye damage.

****NEVER LOOK DIRECTLY AT THE SUN WITHOUT PROTECTIVE EYEWEAR****

During a total solar eclipse, the moon is positioned at just the correct distance to create a perspective where it is the same angular size as the sun and the moon appears to completely block the sun.

Outside the path of totality, the viewing angle will impact the view, creating a partial solar eclipse. At the peak, depending on the zone of magnitude or percent of totality, viewers may be able to see a sliver of light or crescent. The size of that crescent of light increases as the percent of totality decreases.

During an annular eclipse, the more common type of eclipse, the moon is positioned at or near its farthest point from the Earth. Because it is further from the Earth, the perspective makes its appearance smaller than the sun, creating the image of a dark disk (the moon) on top of a brighter disk (the sun), which produces a bright ring around the perimeter of the sun.

Eclipse timeline in Pennsylvania (all times Eastern Daylight Savings Time)

2:00 PM: The eclipse phase sequence will begin around 2:00 p.m. (EST). As the Moon's orbit begins to travel in between the Sun and Earth, appearing as a dark shadow increasingly moving into the bright sphere of the sun.

3:00 PM: When the Moon is covering most of the Sun, watch for the ambient light to change and grow dimmer. The change will become more pronounced in the last 15 minutes before totality. The light may look eerie or strange. Even if it's cloudy and you can't see the Sun, the skies will still grow darker.

3:15 PM – 3:20 PM: Within the path of totality, the total eclipse phase as the Moon completely covers the Sun's surface. The sky will darken much like dawn or dusk for the short duration of the total eclipse.

3:20 PM – 4:30 PM: The phases of the solar eclipse will be played out in reverse.

4:30 PM: The visible eclipse effects will conclude around 4:30 p.m. in Pennsylvania.

Time chart for durations in PA towns that fall in the path of totality

Pennsylvania City /Town/Borough	Totality Start/Maximum Eclipse	Duration of Totality Phase* (minutes:seconds)
North Springfield	3:15:50 PM EDT	3:43
Edinboro	3:16:22 PM EDT	3:19
Erie	3:16:24 PM EDT	3:40
Meadville	3:16:34 PM EDT	2:35
North East	3:16:47 PM EDT	3:40
Spring Creek	3:17:38 PM EDT	2:26
Warren	3:18:56 PM EDT	0:47

Safety during solar eclipses

These safety precautions should be also followed during any outdoor events occurring during the two-three hours of the eclipse phase progression, whether it be with the intent of eclipse viewing, outdoor

laboratories/learning, playground time, sports events, or even during commute or transport to and from school or other events.

Eye safety

Observers should always use solar viewing or eclipse glasses, hand-held solar viewers made with sun filter film, or an alternative safe solar viewing method, such as a pinhole projector, to view the sun. This includes when watching a partial or annular eclipse, or before or after totality for a total solar eclipse. Even a short glimpse of the sun can permanently damage the rods and cones in the human retina. Eye safety precautions during the eclipse should be followed when viewing from both indoor and outdoor locations.

[NASA indicates that viewing during the fleeting moments of totality during a total solar eclipse can be safe](#)[Opens In A New Window](#); however, extreme caution must be practiced because totality is dependent on the full magnitude of effect and viewing angles. In some locations totality lasts only one second, in others the span may be as long as 4 minutes 28 seconds.

Safe solar viewers are thousands of times darker than even the darkest sunglasses. Eclipse viewing apparatuses should comply with the ISO 12312-2 international safety standard.

NASA provides more about viewing a solar eclipse eye safely on [the NASA solar eclipse website](#)[Opens In A New Window](#).

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Equipment/technology safety

To safely use a telescope, binoculars, camera, or cell phone to view a partial eclipse, you must place a safe solar filter on the front of the device, protecting the optics from the sun's intense heat and light. Some special solar telescopes or binoculars are designed specifically for viewing the sun, which have solar filters built into the instrument.

Do not look at the sun through a camera, a telescope, binoculars, or any other optical device while using your eclipse glasses or hand-held solar viewer — the concentrated solar rays will damage the filter and enter your eye(s), causing serious injury.

Watching a solar eclipse on your smartphone camera or other device that is not configured to view solar events can put you at risk of accidentally looking at the sun when trying to line up your camera. It could also damage your smartphone or camera. *Don't take the risk.*

Seek expert advice before using a solar filter with a camera, a telescope, binoculars, or any other optical device. Note that solar filters must be attached to the front of any telescope, binoculars, camera lens, or other optics. Visit a vendor that specializes in astronomical equipment to purchase solar filters or other equipment dedicated to solar viewing.

Skin safety

During any partial, annual, and the phases of a total eclipse the sun will be very bright and intensified. It is recommended that individuals spending time outside during the eclipse phase sequence take precautions to prevent skin damage. These may include wearing sunscreen, a hat, and protective clothing with SPF ratings.

Food, water, shelter

For those spending much of the eclipse outside, especially if you are viewing away from your home, as well as those who are organizing eclipse viewing events, please ensure participants bring or have access to the following:

- Appropriate layers for sunny, cold, or rainy conditions and comfortable walking shoes
- Water
- Snacks or a meal
- Sunscreen, umbrella, or sun shelter
- Bug repellent
- Camp chairs, a blanket, or other seating
- Necessary medications

Driving safety

Anticipate issues with transportation due to the uniqueness of the eclipse phenomena. Pennsylvania has viewing opportunities that are drawing eclipse viewers to many areas that are not accustomed to high traffic volume. Areas with normal high traffic will have increased traffic. In all areas, be prepared for

spontaneous disruptions caused by distracted drivers. Awareness of potential complications is crucial even if individuals are not intentional eclipse viewers.

Consider the following:

- Pre-plan your route. Know your destination in advance and where you plan to safely park to view the eclipse.
- Do not pull off the side of a roadway to view the eclipse as it could impede traffic and is unsafe.
- Do not park on privately owned land (empty lots or farm fields) unless arrangements have been made with the owner of the property.
- In the event your GPS does not work, keeping a paper travel map in your preparedness kit is smart.
- Keep your gas tank topped off.
- If it is a rainy week prior to the eclipse date, be mindful of parking in grassy areas such as fields. The ground may be soft, and your vehicle may get stuck.
- Do not call 9-1-1 for traffic jams unless it is a life-safety emergency.