

The Great American Solar Eclipse

Monday, August 21, 2017

Starting at 1 P.M.



Diagram A: P-H-M 2:22 pm



Diagram B: Carbondale, IL. 1:21 pm

So What is The Great American Eclipse and Why Is This Eclipse Such A Big Deal?

This will likely be the most observed celestial event in US history! The last major total solar eclipse that swept from the west coast across the entire U.S. occurred on June 8, 1918, with the Moon's shadow tracing a narrow path from Washington State to Florida. That is almost 100 years ago! Yes, there have been other total eclipses crossing small parts of America, but not one tracking across the entire United States like the one in 1918, or the one coming up on Aug. 21, 2017. There hasn't even been an opportunity to see a total solar eclipse in the U.S. mainland since 1979! In addition, this eclipse will only be seen by people located the continental United States! It is our own Great American Eclipse!

Yes, that is correct, **all of North America** will see (weather permitting) some type of Solar Eclipse on Monday, August 21, 2017! Most of the country will see a **partial solar eclipse**. However, there is a swath of land from Oregon to South Carolina, called the path of totality, where observers will experience **a total solar eclipse**. Roughly 12 million people live within the path of totality and 40 million more within a few hours drive! For instance, Evanston, IN will experience near 99% coverage of the sun! Here in the P-H-M area we are just above this narrow path of totality; therefore, we will see a partial solar eclipse. But don't worry, the partial solar eclipse will still be awesome!

What Exactly Will We See Here In P-H-M?

Diagram A, shows what it will look like here in P-H-M at its maximum (about 88% covered). This is called a ***Partial Solar Eclipse***.

Diagram B, shows what it will look like in Carbondale IL, which is about 300 miles south of Chicago. At this location, and all along the path of totality, you'd see a ***TOTAL SOLAR ECLIPSE*** (100% covered).

What Is A Solar Eclipse And How Is It Different From A Lunar Eclipse?

A **Solar Eclipse** occurs when the New Moon crosses the face of the Sun. Since the Moon is one-fourth the size of the Earth it will cast a relatively small shadow onto the Earth; therefore, typically few people get to experience a total Solar Eclipse, which happens only once or twice a year, and rarely occurring in our area. But not this time! Millions of people are located in the path of totality for The Great American Eclipse and everyone else in the United States can experience a partial solar eclipse right in their backyard! However; it is absolutely essential you protect your eyes from damage when observing a solar eclipse. You **MUST have eye protection** when observing any kind of solar eclipse.

A **Lunar Eclipse** occurs when a Full Moon, which is opposite the Sun relative to the Earth, passes into the Earth's shadow. Since the Earth's shadow is very large and the Moon is much smaller, a lunar eclipse: lasts longer; can be viewed by everyone on the night side of the Earth; and, **eye protection is not necessary**.

So, Why Is It Such A Big Deal Here If We're Not Going to See A Total Solar Eclipse?

A **Partial Solar Eclipse** is a spectacular thing to observe especially when the Sun is 88% covered by the New Moon. In this setting we can see real science in action by observing the Moon's true motion across the sky from west to east as it moves across the Sun from right to left. We may also see a few stars, like the bright star Regulus, in the constellation Leo the Lion. Regulus will be located directly to the left of the Sun. The planet Jupiter will also be to the left of the Sun and planets Mars and Venus will be to the right of the Sun. This shows that stars and planets are in the sky all the time regardless of whether it is day or night. At maximum coverage the sky will darken, the air will cool, and some animals will even begin their nocturnal behaviors!

When Does The August 21st Eclipse Start And How Long Will It Last?

Here in P-H-M, weather permitting, you'll observe the New Moon:

- ☐ Touching the upper west (right) quadrant of the Sun around 1:00 pm;
- ☐ **Moving east with maximum coverage (88%) of the Sun around 2:22 pm;**
- ☐ Concluding around 3:46 pm, exiting directly east (left) edge of Sun

In Carbondale IL, weather permitting, you'll observe the New Moon:

- ❑ Making first contact on the upper west (right) quadrant of the Sun around 11:52 am;
- ❑ Totality will occur around 1:21 pm. (Totality will be 2 minutes and 41 seconds);
- ❑ Concluding its passage at 2:47 pm when it exits the upper east (left) edge of Sun;

What If The Weather Is Bad And We Miss The Eclipse?

There will be live TV remotes from NASA across the country that will be on the internet and/or cable/direct TV. If for some reason you miss the August 21st Solar Eclipse you'll get another chance in seven years on April 8, 2024, when the next major total solar eclipse will make a path that goes diagonally across the United States from Texas to New England. It will not be The Great American Eclipse because it will also be seen in other parts of the world but it will still be an awe inspiring total solar eclipse!

Additional, trusted online resources for The Great American Eclipse:

American Astronomical Society: <https://eclipse.aas.org/faq>

NASA: <https://eclipse2017.nasa.gov/>

The Great American Eclipse: <https://www.greatamericaneclipse.com/>

Chuck Bueter's website: <http://www.nightwise.org/eclipse-2017>

Chuck is an astronomy advocate that has worked with PHM several times on community outreach projects such as Transits of Venus and "Let There Be Night" as well as The Great American Eclipse. Click on the "Projects" tab and choose "Eclipse 2017".

Safety First When Observing A Solar Eclipse!

It is imperative, while observing the partial solar eclipse, that you wear **EYE PROTECTION** for the **ENTIRE OBSERVATION**. *Never look directly at the Sun without proper eye protection*. The Sun's UV radiation can burn the retinas in the eyes leading to permanent damage or even blindness.

Solar Eclipse Shades have been provided in each student packet. **USE THEM !**

The following are some common items mistakenly thought to be safe to use when observing an eclipse. They are NOT safe to use during a solar eclipse!

- Welder's Masks must be #14 or higher, anything rated less will cause severe eye injury.
- The fabric of a Mylar balloon is dangerous to look through since it offers no eye protection.
- All Sunglasses are worthless; stacking two or three together will not protect your eyes!
- Never observe a Solar Eclipse through a telescope with any kind of sun filter.

Please refer to the the following document for additional information and resources about how to properly view the solar eclipse using your solar eclipse glasses.

