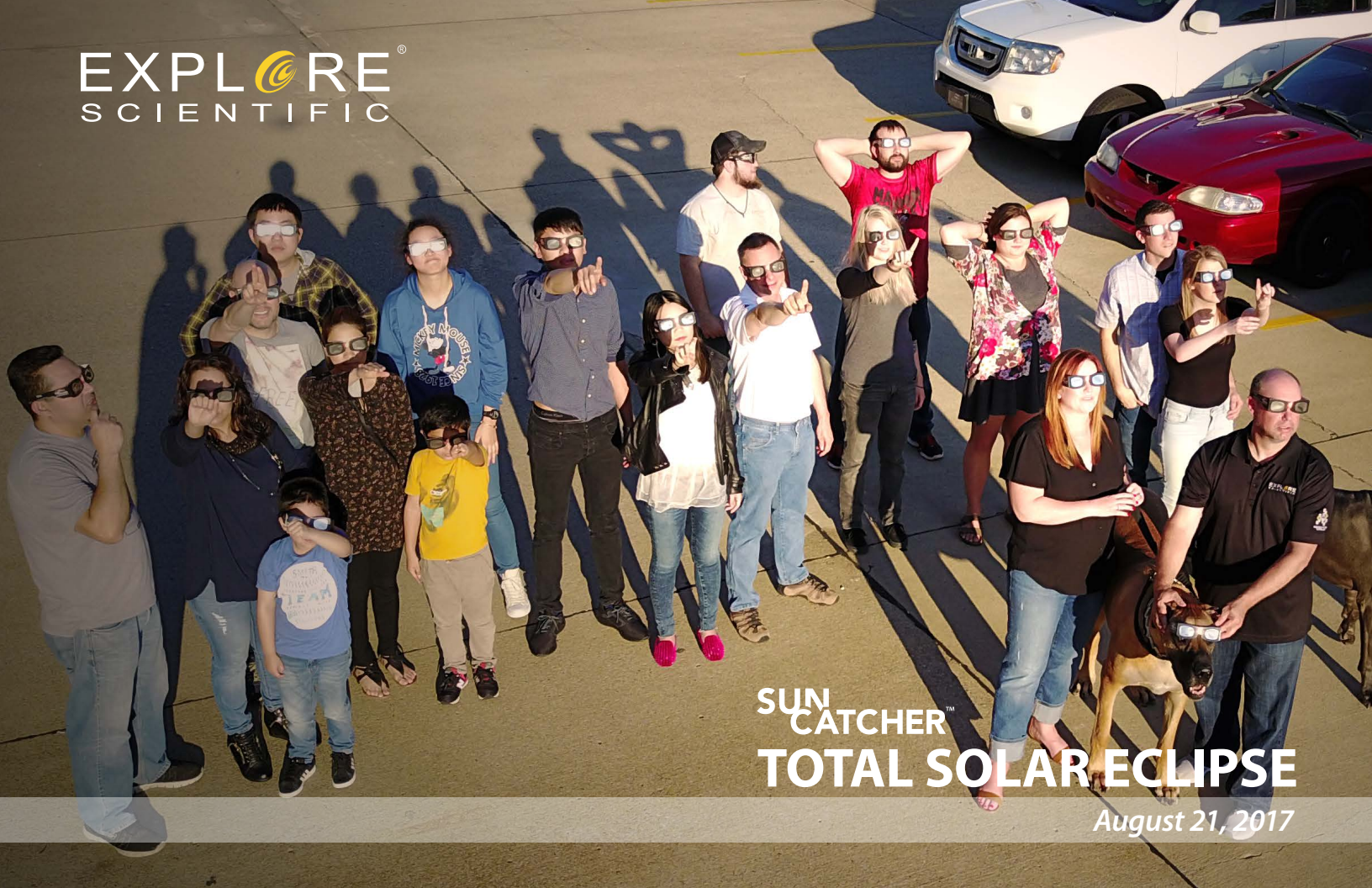


EXPLORE<sup>®</sup>  
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TOTAL SOLAR ECLIPSE

August 21, 2017



## ***The 21 August 2017 Total Solar Eclipse***

The United States will experience its first total solar eclipse since February 26, 1979. All of the Continental United States will experience at least a significant partial solar eclipse. For those fortunate enough to live along the narrow track of totality, or travel to the path of totality, up to 2 minutes and 40 seconds under the shadow awaits viewers. The partial phase of an eclipse never compares to totality; get to the total line!



This eclipse will attract a great deal of attention, both internationally and within the United States, from amateur and professional astronomers, the general public and media. It is best to make plans for the eclipse early; there are already hotels completely booked. Things to consider in advance include where you are going to go, how you are planning on observing the eclipse, local eclipse circumstances, weather contingency, etc.

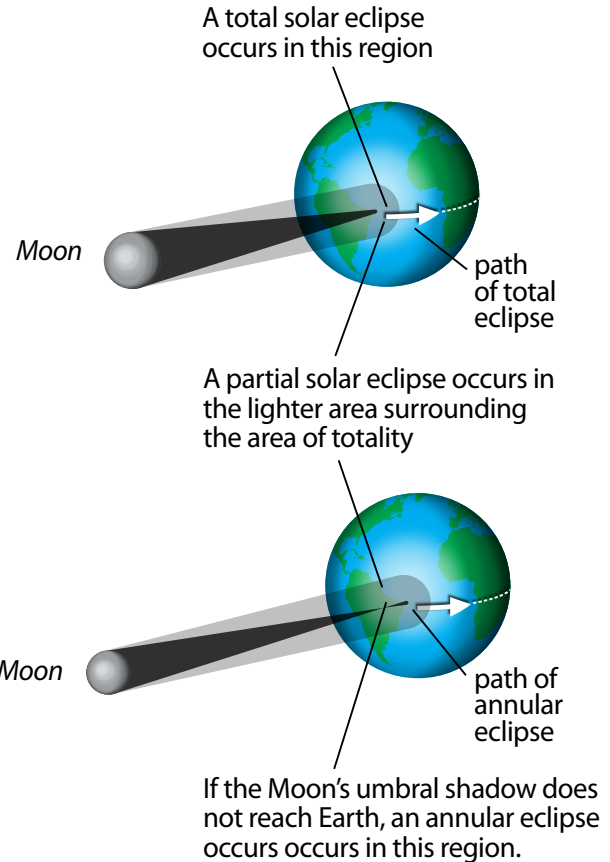
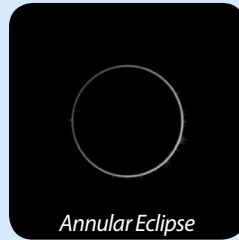
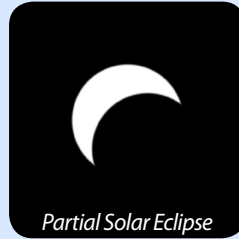
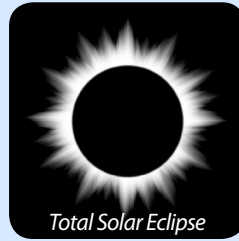
## An Eclipse Primer

The Earth finds itself in a marvelous Solar System location, with a large moon. These dynamics allow for a possible lunar eclipse at full moon and a possible solar eclipse at new moon. Eclipses do not always occur due to the orbital planes of the Sun-Earth and Earth-Moon.

When a solar eclipse occurs, at least one event ensues, depending on Earth-Moon distance or if the Moon's pass in front of the Sun is not central. If the Moon is at or near apogee (furthest point), it will appear smaller and an annular eclipse or a hybrid (annular along part of the path and total at the path's center) will occur. Partial eclipses are seen by those outside totality or a non-central eclipse.

*Image courtesy of  
Observe Eclipses, Reynolds & Sweetsir*

### Types of Solar Eclipses



## ***Location, Location, Location...***

August 2017 eclipse chasers will have a long path to observe the eclipse. A number will select the closest point to their home. Excellent highways and roads should allow for fairly easy transportation. There are numerous large and small airports the eclipse chaser may choose to fly into, and then drive to the eclipse center line. If flying, just remember to consider what equipment you might want to take to the eclipse versus airline luggage constraints. And know that a lot of people will travel to see the eclipse, including from outside the United States.

You will want to get as close to the center line as possible to enjoy the maximum totality duration unless you want to observe a grazing eclipse by setting up along either the northern or southern limit to see extended Baily's beads and the 'diamond ring'. Many uninformed individuals will think you can be close to the northern or southern limit to see totality. This is one thing we can all do within our communities, especially those close to the eclipse path, is to inform people they need to be within the totality eclipse path to see totality. Otherwise they will see a deep partial solar eclipse and truly miss the beauty of totality.

Experienced eclipse chasers - unless on a ship or planning to 'fly' the eclipse path choose a preferred location based on several variables, such as site access and weather prospects. They also look for weather alternatives and routes that can get them to clear(er) skies. Excellent maps and online resources are available:

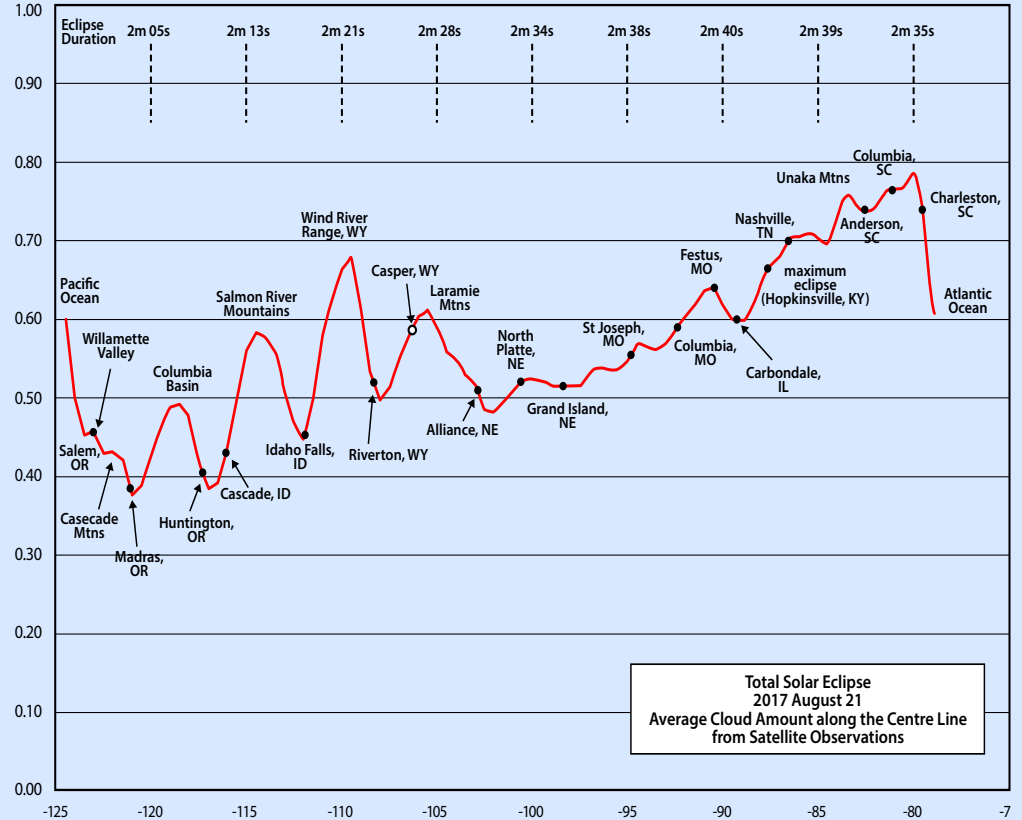
- *Bill Kramer's Eclipse Chasers' Map:* <http://www.eclipse-chasers.com/tseCalculator.php?TSE=tse2017d>
- *Detailed JPG Maps on NASA's Eclipse Page:* <http://eclipse.gsfc.nasa.gov/SEmono/TSE2017/TSE2017.html>
- *NASA's Animated Map:* <http://eclipse.gsfc.nasa.gov/SEanimate/SEanimate2001/SE2017Aug21T.GIF>
- *NASA Eclipse Path Table:* <http://eclipse.gsfc.nasa.gov/SEpath/SEpath2001/SE2017Aug21Tpath.html>
- *NASA Interactive Google Map:* <http://eclipse.gsfc.nasa.gov/SEgoogle/SEgoogle2001/SE2017Aug21Tgoogle.html>
- *Xavier Jubier's Interactive Map:* [http://xjubier.free.fr/en/site\\_pages/solar\\_eclipses/TSE\\_2017\\_GoogleMapFull.html](http://xjubier.free.fr/en/site_pages/solar_eclipses/TSE_2017_GoogleMapFull.html)
- *Eclipse Bulletin: Total Solar Eclipse of 2017 August 21* <http://astropixels.com/pubs/TSE2017.html>

## Weather Prospects

Successful eclipse chasers will tell you that one of the most-important aspects of eclipse expedition planning are the weather scenarios. A lot of reliable historical weather pattern data, from rainfall to cloud cover, is available. You want to maximize your chance of observing the eclipse! There are numerous ways to research location-specific meteorological data and weather patterns around the date of the eclipse. And the advantage is that several people have already done much of that research.

Some of the best pre-eclipse forecasts and summaries since 1979 have been produced by Canadian meteorologist Jay Anderson, an avid total solar eclipse chaser with twenty total solar eclipses. Other meteorologists will produce reliable weather forecasts based on up-to-the-minute satellite imagery and U.S. ground stations. The best advice is to be tuned to forecasts prior to the eclipse and have alternate sites planned.

Image from Jay Anderson's 2014 Eclipse Weather site: <http://home.cc.umanitoba.ca/~jander/tot2017/tse17intro.html>



## **Observing the Eclipse**

How do you plan on observing the eclipse? Is this your first eclipse? Will you be with a group of people that will want you to detail what is going on? Do you have photography or video plans? Or will you be doing some sort of public outreach for the eclipse; which is an awesome way to bring astronomy to people!

### **VIEWING SAFETY**

You have several options to observe the partial phase of the eclipse, from a telescope with a solar filter to a telescope or binoculars which project the image onto a surface. Do not forget SAFETY! Totality itself will not harm your eyes; but the sun shining though, even in partial phases of the eclipse will do the damage. Order both eclipse glasses and camera/telescope solar filters in advance; if you wait just prior to the eclipse there will be a big demand, and you may not find the protection you need.

### **Binoculars and Telescopes**

Nearly any binocular or telescope you own would provide satisfactory views of the total eclipse. Some observers prefer binoculars because it gives them the ease of observing other eclipse phenomena and then easily go back to totality. Others like the telescopic view. Do not use too high a magnification if this is your first eclipse; remember that the solar corona can extend several solar diameters. A mount that tracks will take away one potentially-distracting factor: continuing to center the Sun during the eclipse. Regardless of what equipment you use, be prepared to quickly put back on the proper solar filters at the 3rd contact diamond ring.



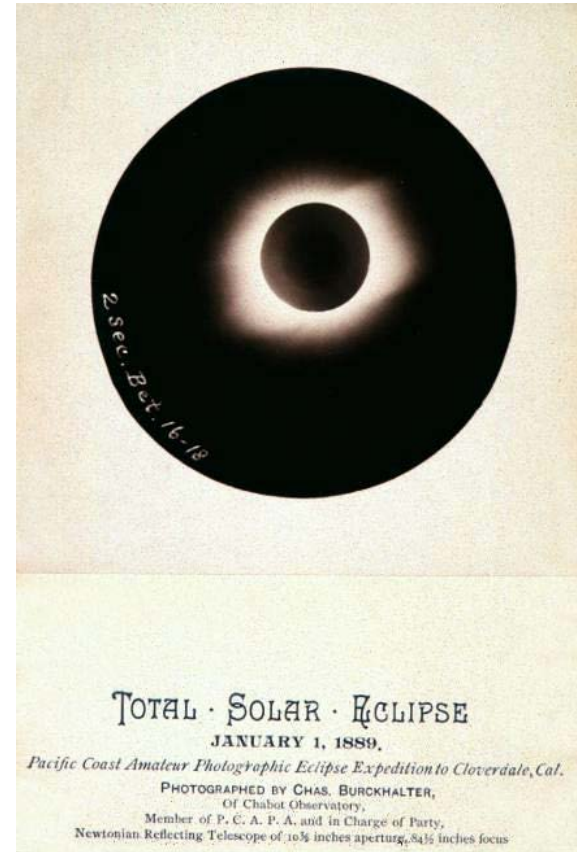
*Viewing safety is paramount, from a proper telescope filter to naked eye protection.*

## ***Eclipse Imaging***

If you decide to photograph the eclipse, check out your equipment well in advance, from your system's focus to exposure. Focus is one of the most-critical factor to assure you take excellent images. Understand your system's field of view; you do not want to miss out coronal features unless you are planning high-magnification imaging. Video will also provide a way to image the eclipse. Time lapse images of people - which also show changes in sunlight - can be fascinating.

Many first time imagers will set their cameras to auto focus (*if using the camera's lens instead of a telescope camera system*) and auto exposure. The camera will 'look' for focus and have difficulties finding the focus. This is not something you want to be dealing with during totality. You should pre-set the camera at manual focus and infinity; just make certain the lens infinity setting is in fact infinity.

Seasoned eclipse imagers make certain they have fully-charged and reliable batteries and plenty of space on recording medium. Have extra batteries and recording medium available; you do not want to shoot so many partial phase photos that you discharge your battery or use all available card space. Many prefer to image in the highest quality possible; usually 'raw.'



*January 1, 1889 Total Solar Eclipse.  
Charles Burckhalter, Chabot Observatory*

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# SUN CATCHER GLASSES

## 100% Safe Solar Viewing Glasses

ONCE IN A LIFETIME MAGICAL MOMENT IS FAST APPROACHING - BE PART OF HISTORY - SEE THE FIRST "TOTAL" SOLAR ECLIPSE IN CONTINENTAL USA IN 41 YEARS!!! THE FIRST COAST TO COAST USA "TOTAL" SOLAR ECLIPSE IN 99 YEARS!!! The BONE CHILLING Historical Moment is nearly upon us! August 21, 2017. BE PREPARED! The last time a total eclipse occurred in USA, there was no internet, no cell phones, no personal computers! You are the Informed Generation! You will be in AWE!!



**NEW SOLAR ECLIPSE GLASSES for SAFE DIRECT SUN VIEWING**  
made with ISO Certified Material - Unique Style Great American  
Solar Eclipse August 21, 2017, sold in 1 or 2 Packs,  
shipped in counter display stand.



Conforms to and meets the Transmission Requirements of ISO 12312-2, Filters for Direct Observation of the Sun. Meets the Transmission Requirements of EN 1836:2005 + A1: 2007 (3) for an E15 Filter for the Direct Observation of the Sun. Meets the Transmission Requirements of AS/NZS 1338.1:2012, Filters for Eye Protectors. EC Type Examination by: SA Global Assurance Services Ltd. (Notified Body No. NB2056), MKS 8HJ U.K.



**PREPARE FOR THE SOLAR ECLIPSE! AUGUST 21<sup>ST</sup> 2017**

# SUN CATCHER 5X30 BINOCULARS

**100% Safe Solar Viewing Binoculars**

The Sun Catcher are a lightweight 5x30 binoculars are made to encourage adventure. They have a bright 30mm aperture, a 5x magnification, rubber coating and a centrally located focusing wheel. Perfect little pair of binocular for viewing the solar eclipse.



Conforms to and meets the Transmission Requirements of ISO 12312-2, Filters for Direct Observation of the Sun. Meets the Transmission Requirements of EN 1836:2005 + A1: 2007 (3) for an E15 Filter for the Direct Observation of the Sun. Meets the Transmission Requirements of AS/NZS 1338.1:2012, Filters for Eye Protectors. EC Type Examination by: SA Global Assurance Services Ltd. (Notified Body No. NB2056), MKS 8HU U.K.

# SUN CATCHER 50MM TELESCOPE

## 100% Safe Solar Viewing Telescope

THE GRANDDADDY OF THEM ALL - a FREAKY 2.5 minute 60 mile wide MIND BLOWING TOTAL ECLIPSE BLACKOUT will pass America from Coast to Coast. Oregon's West Coast to South Carolina's East Coast!!! Experts predict this will be the most watched Total Solar Eclipse in History!!! Get to the path of TOTALITY days before the event! Expect roads to be JAMMED, literally BUMPER to BUMPER near path of Blackout Totality. Most of Canada, USA and Mexico will be within range of a major 80% PARTIAL SOLAR ECLIPSE. Great little Telescope for this grand Event.

### What's included?

- 100% Sun Safe Telescope
- Two Eyepieces (18x, 28.8x)
- Aluminum Tripod



Conforms to and meets the Transmission Requirements of ISO 12312-2. Filters for Direct Observation of the Sun. Meets the Transmission Requirements of EN 1836:2005 + A1: 2007 (3) for an E15 Filter for the Direct Observation of the Sun. Meets the Transmission Requirements of AS/NZS 1338.1:2012, Filters for Eye Protectors. EC Type Examination by: SA Global Assurance Services Ltd. (Notified Body No. NB2056), MKS 8HJ U.K.



**PREPARE FOR THE SOLAR ECLIPSE! AUGUST 21<sup>ST</sup> 2017**

# SUN CATCHER 70MM TELESCOPE

## 100% Safe Solar Viewing Telescope

HOW DID ANCIENT ASTRONOMERS ACCURATELY PREDICT SOLAR ECLIPSES HUNDREDS OF YEARS INTO THE FUTURE??? Use Our EDUCATIONAL LEARNING TOOL and Experience the Rare Astronomical Phenomenon of all the different types of solar eclipses, Total, Partial, Annular, Hybrid, safely with your 70mm Portable Telescope seeing the Moon Orbiting directly in the path of the Sun's Rays and the different stages of a Total Solar Eclipse.

### What's included?

- 100% Sun Safe Telescope
- Two Eyepieces (18x, 28.8x)
- Aluminum Tripod



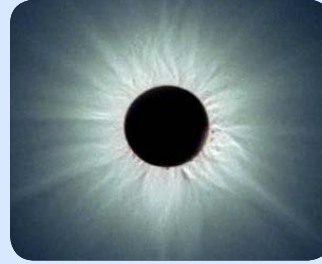
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5/20/12 Annular



3/29/06 Total; 5 stacked



6/21/01 Total; 10 stacked



7/11/10 Total; 3rd Contact

*Photos by Dr. Mike Reynolds; all digital except the June 21, 2001 total solar eclipse*

Looking UP! Finally make certain you look at the eclipse! Search for planets and stars right before and during totality. Notice the shadow as it approaches you; ; look for the sunset-sunrise effects: the colorstt around the horizon. Look at Bailey's beads and the diamond ring, the signal that 2nd contact - and totality - have arrived.

Dr. Mike Reynolds saw his first total solar eclipse March 7, 1970. He has lead numerous expeditions and observed 18 total solar eclipses - in 18 attempts; observing from land, sea, and air. Reynolds' observations and photographs have been published in numerous places, including the book Observe Eclipses and Astronomy. He is Professor of Astronomy at Florida State College and the Association of Lunar and Planetary Observers' Eclipse Coordinator.

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