

Image: NASA SOHO

## Transit of Mercury 2019 November 11

Monday, 7:35 a.m. - 1:04 p.m. EST

During the transit, Mercury appears as a tiny dot slowly gliding across the face of the sun. To witness this phenomenon, you need to view a magnified image with proper solar protection. Unlike Venus in transit, in which the planet is big enough for the human eye to discern without magnification, Mercury is smaller and more distant. On Nov. 11 the planet diameter appears a mere 10 arc-seconds across. For comparison, Venus is about 60 arc-seconds (one arc-minute) across, and the sun is about 30 arc-minutes (half a degree) across.

In 1677, at age 20, astronomer Edmond Halley witnessed a transit of Mercury from the island of St. Helena. Decades later, in 1716, Halley wrote of his new method using the transit of an inferior planet (i.e., Mercury or Venus) to measure the size of the solar system. Because Venus is closer and yields a larger parallax, Halley appealed for global expeditions to time the next transit of Venus.

### 2019 Transit of Mercury

Approx. Contact Times  
(geocentric, in Universal Time):

1st Contact: 12:35  
2nd Contact: 12:37  
Greatest: 15:20  
3rd Contact: 18:02  
4th Contact: 18:04

Map by [Xavier Jubier](#)



Next Transit of Mercury:  
2032 Nov. 13 (map)

## Images from previous years



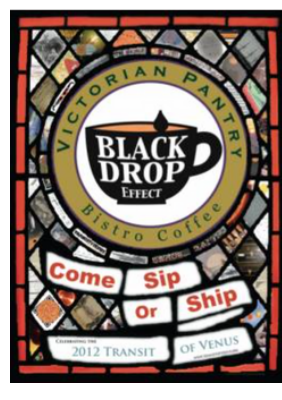
### Blogs tagged "transit of Mercury"



Transit of



Transit of



Black Drop

Purchase *Black Drop Effect* coffee from Victorian Pantry in Granger, IN.

See Fred Espenak's handiwork for transit specifics.

## Links

These websites may help you prepare for the next transit of Mercury, including images and other content from previous transits of Mercury.



EclipseWise-Fred Espenak  
<http://www.eclipsewise.com/oh/tm2019.html>  
Fred Espenak is the authority on mapping solar phenomena. See his charts, tables, catalogs, etc.



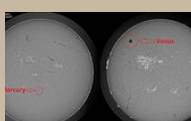
Where and When to View  
[http://xjubier.free.fr/en/site\\_pages/transits/ToM\\_2019.html](http://xjubier.free.fr/en/site_pages/transits/ToM_2019.html)  
Interactive maps show where 2019 Transit of Mercury is visible across the globe and mean cloud cover.



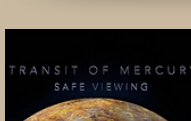
US Naval Observatory Data  
[https://aa.usno.navy.mil/data/docs/Mercury2019\\_info.pdf](https://aa.usno.navy.mil/data/docs/Mercury2019_info.pdf)  
USNO lists when transit can be seen from sites around the world. Includes times when the planet is just touching the edges of the sun.



Intro to 2019 Transit of Mercury  
<http://www.nakedeyepianets.com/mercury-transit-2019.htm>  
A general introduction to 2019 transit of Mercury.



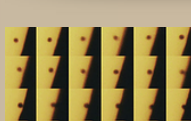
Citizen Science with the Transit of Mercury  
<https://www.skyandtelescope.com/astronomy-news/citizen-tom-mercury-transit/>  
Sky & Telescope suggests opportunities for amateurs to share data for citizen science projects. Note image comparing planet sizes for transits of Mercury and Venus.



Video: Safe Viewing  
<http://www.open.edu/openlearn/>  
Video shows some techniques for observing the sun safely. Website includes other snippets about Mercury.



Spaceweather Now  
[www.spaceweather.com](http://www.spaceweather.com)  
Spaceweather tracks current conditions on the sun, including the evolving sunspots that may rival—if not exceed—the apparent size of Mercury.



Jay Pasachoff - Transits of Mercury & Venus  
<https://sites.williams.edu/pasachoff/transitofvenus/>  
Professor Jay Pasachoff has chased and studied transits of Mercury and Venus, including definitive work on the elusive black drop effect.



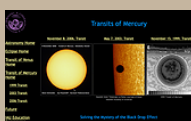
Classroom Activity  
<http://astroscopy.org/edu/publications/tnl/69/mercury.html>  
"Mercury, its time has come," Universe in the Classroom, No. 69, Fall 2006. Includes some relevant haptic activities.



Project CLEA  
<http://public.gettysburg.edu/~marschal/clea/Transitlab.html>  
Project CLEA freely offers an advance exercise for students to quantify parallax and the Astronomical Unit using telescopic images of transits.



Black Drop Explained (Poster)  
<http://micromosis.as.arizona.edu:8000/POSTERS/TOM1999.jpg>  
Scientific poster explains Black Drop Effect as revealed by TRACE satellite observation of a Transit of Mercury. See also [http://micromosis.as.arizona.edu:8000/PUBLICATIONS/VENUS\\_BLACKDROP\\_JAU196.pdf](http://micromosis.as.arizona.edu:8000/PUBLICATIONS/VENUS_BLACKDROP_JAU196.pdf).



Jay Pasachoff's Perspective  
<http://web.williams.edu/Astronomy/eclipse/transits/transitofmercury.htm>  
Jay Pasachoff shares some of his insight from chasing Transits of Mercury as a professional astronomer.



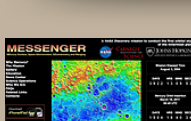
2003 Satellite Images  
[http://sohowww.nascom.nasa.gov/hotshots/2003\\_05\\_07/](http://sohowww.nascom.nasa.gov/hotshots/2003_05_07/)  
2003 Transit of Mercury satellite images give perspective on size of the dot to expect on the sun.



2006 photo gallery  
[http://www.spaceweather.com/eclipses/gallery\\_08nov06.htm](http://www.spaceweather.com/eclipses/gallery_08nov06.htm)  
Photo gallery from 2006 Transit of Mercury gives you an idea of what to expect.



Mercury's Time  
URL:  
The September/October 2006 issue of Mercury magazine features "Mercury's Time to Shine" by Clifford Cunningham. The article illuminates the (sometimes false) claims and observations of mercury transits through the ages; Volume 35, Issue 5, pp.12-19.



Messenger at Mercury  
<http://messenger.jhuapl.edu/>  
Messenger is a NASA Discovery mission to conduct the first orbital study of the innermost planet.

### Local Circumstances for South Bend, IN

(subtract 5 hours to convert UT to EST)

## Halley's Big Idea

Dr. Edmund Halley

Philosophical Transactions Vol. XXIX (1716)

**A New Method of Determining the Parallax of the Sun, or His Distance from the Earth, Sec. R. S., NO 348, p. 454**

Translated from the Latin

"While I was making my observations in the island of St. Helena, about 40 years since, on the stars round the south pole, I happened to observe, with the utmost care, Mercury passing over the sun's disk; and contrary to expectation, I very accurately obtained, with a good 24-foot telescope, the very moment in which Mercury, entering the sun's limb, seemed to touch it internally, as also that of his going off, forming an angle of internal contact. Hence I discovered the precise quantity of time the whole body of Mercury had then appeared within the sun's disk, and that without an error of one single second of time; for, the thread of solar light, intercepted between the obscure limb of the planet, and the bright limb of the sun, though exceedingly slender, affected my sight, and in the twinkling of an eye, both the indented made on the sun's limb by Mercury entering into it, vanished, and that made by his going off, appeared. On observing this I immediately concluded, that the sun's parallax might be duly determined by such observations, if Mercury, being nearer the earth, had a greater parallax, when seen from the sun; for, this difference of parallaxes is so very inconsiderable, as to be always less than the sun's parallax, which is sought; consequently, though Mercury is to be frequently seen within the sun's disk, he will scarcely be fit for the present purpose.

There remains therefore Venus's transit over the sun's disk..."

From <http://eclipse.gsfc.nasa.gov/transit/HalleyParallax.html>

00 : 00 : 00 : 00

Days Hours Mins Secs

Until start of 2019 transit of Mercury at 07:35 a.m. EST, as seen from center of earth (geocentric). Your time will vary.

For 2019 transit of Mercury simulations for your city, see [timeanddate.com](http://timeanddate.com).

### Observe Safely

Do not observe Mercury near the sun without proper eye protection. See [Eye Safety column at Eclipse 2024 page](#).



Here is an authoritative talk about eye safety by Dr. Ralph Chou:  
<https://youtu.be/4RG9Fcr5SM>.

He notes, #14 welder's glasses are falling out of favor; for polycarbonate filters must have gold filter to attenuate the dangerous UV rays, and not all have the gold filter.

Or read Dr. Chou's summary of eye safety excerpted from my transit of Venus website: [Viewing the Transit and Eye Safety](#).

## Chuck Stuff

These links take you to content I made for previous transits of Mercury. They may be pertinent for 2019.



More...

### Build a Sun Funnel

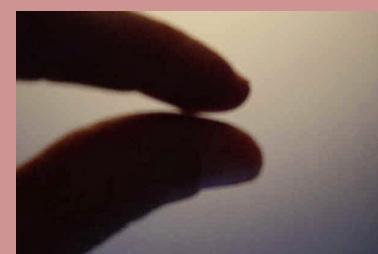
Make your own sun funnel, a device that allows a group of people to observe the sun safely with a telescope.



More...

### Previous Centuries

A look at transits of Mercury and Venus from previous centuries.



More...

### Black Drop

History and modern science about the Black Drop Effect, an observers conundrum in which the planet appears to elongate near the edge of the sun.



More...

### Black Drop Effect Coffee

Black Drop Effect Coffee celebrates the mysterious drip-like phenomenon.



More...

### Eye Safety

Six ways to view the sun safely.



More...

### Cosmic Cocktail

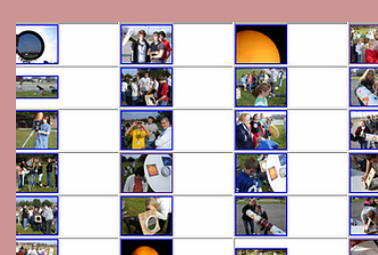
A celestial beverage to celebrate the event—or bemoan the weather. Reprinted from transit of Venus.



More...

### Chuck's 2006 ToM page

My complete web page for the 2006 Transit of Mercury.



More...

### PHM images 2006

Images from 2006 Transit of Mercury event at Penn-Harris-Madison (PHM) site in Mishawaka, IN.



More...

### Classroom Astronomer

<http://classroomastronomer.toteachthesun.net>

Article by Chuck Bueter: *After the Transit of Venus Party is Over*

In the Spring 2012 issue of The Classroom Astronomer, proposes "history, science skills and other things using historical transits extend the transit to exoplanetary discoveries, and prepare for the more challenging, but commoner, next Transit of...Mercury in 2016!" Math and science activities are relevant to the 2012 Transit of Venus, too.



More...

### PHM 2006 Recap

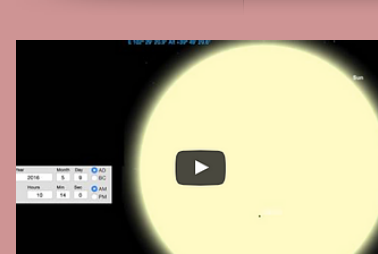
Recap of 2006 Transit of Mercury events at PHM.



Read More

### 4-minute Transit Video

Four-minute video recaps Transit of Venus, which ensued from Edmond Halley's observing a transit of Mercury.



Read More

### 2016 View From South Bend

Video depicts 2016 path of Mercury across sun, as seen from South Bend perspective.