

# ONE SPOT, TWO ECLIPSES

Richard "RIK" Hill

Coordinator, ALPO Solar Section

The Great American Solar Eclipse of 2023 piqued the interest of a whole new population of amateur astronomers in seeing more of these events. We have a rather unique opportunity coming up in the near future for just such observations. On Oct. 14, 2023 an **annular eclipse** will pass across the United States roughly from Eugene, OR to Brownsville, TX with over 90% of the Sun being obscured at maximum eclipse in the latter location. Maximum eclipse for this one will be in Panama where 95% of the Sun will be eclipsed. (Figure 1)

What is more generally known is that a **total solar eclipse** will pass from the U.S. border west of San Antonio, TX through Toledo, Ohio only 6 months later on Apr. 08, 2024 with maximum eclipse happening north of Mexico, City. (Figure 2)

But the fascinating thing for U.S. observers is that these two eclipses cross paths just a little west of San Antonio near Leakey, TX. (Figure 3) So you have the opportunity, with a little planning, to stand in the same spot to observe both eclipses! (Figure 4)

Shall we plan to meet on the mornings of Oct. 14, 2023 and Apr. 08, 2024 in Leakey, TX?!

Acknowledgments:

Figure 1 – <https://eclipse.gsfc.nasa.gov/SEplot/SEplot2001/SE2023Oct14A.GIF>

Figure 2 - <https://eclipse.gsfc.nasa.gov/SEplot/SEplot2001/SE2024Apr08T.GIF>

Figure 3 and Figure 4 – Google maps.

# Annular Solar Eclipse of 2023 Oct 14

Geocentric Conjunction = 17:36:28.8 UT    J.D. = 2460232.233667

Greatest Eclipse = 17:59:21.0 UT    J.D. = 2460232.249549

Eclipse Magnitude = 0.9520    Gamma = 0.3752

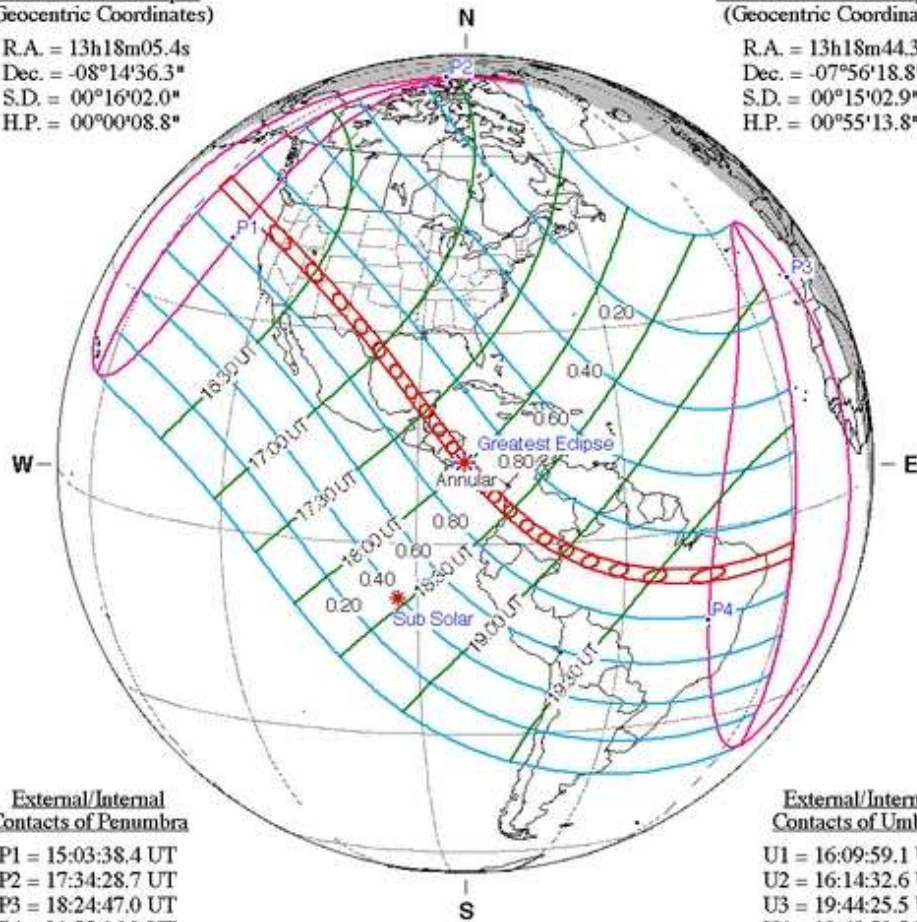
Saros Series = 134    Member = 44 of 71

## Sun at Greatest Eclipse (Geocentric Coordinates)

R.A. = 13h18m05.4s  
Dec. = -08°14'36.3"  
S.D. = 00°16'02.0"  
H.P. = 00°00'08.8"

## Moon at Greatest Eclipse (Geocentric Coordinates)

R.A. = 13h18m44.3s  
Dec. = -07°56'18.8"  
S.D. = 00°15'02.9"  
H.P. = 00°55'13.8"



## External/Internal Contacts of Penumbra

P1 = 15:03:38.4 UT  
P2 = 17:34:28.7 UT  
P3 = 18:24:47.0 UT  
P4 = 20:55:06.9 UT

## External/Internal Contacts of Umbra

U1 = 16:09:59.1 UT  
U2 = 16:14:32.6 UT  
U3 = 19:44:25.5 UT  
U4 = 19:48:53.5 UT

## Local Circumstances at Greatest Eclipse

Lat. = 11°21.7'N    Sun Alt. = 67.9°  
Long. = 083°04.3'W    Sun Azm. = 208.0°  
Path Width = 187.4 km    Duration = 05m17.2s

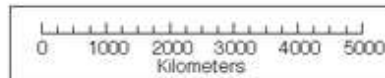
## Ephemeris & Constants

Eph. = Newcomb/ILE  
 $\Delta T = 80.7$  s  
k1 = 0.2724880  
k2 = 0.2722810  
 $\Delta b = 0.0''$      $\Delta l = 0.0''$

## Geocentric Libration (Optical + Physical)

l = -3.80°  
b = -0.48°  
c = 20.45°

Brown Lun. No. = 1247



F. Espenak, NASA's GSFC - Fri, Jul 2,  
[sunearth.gsfc.nasa.gov/eclipse/eclipse.html](http://sunearth.gsfc.nasa.gov/eclipse/eclipse.html)

# Total Solar Eclipse of 2024 Apr 08

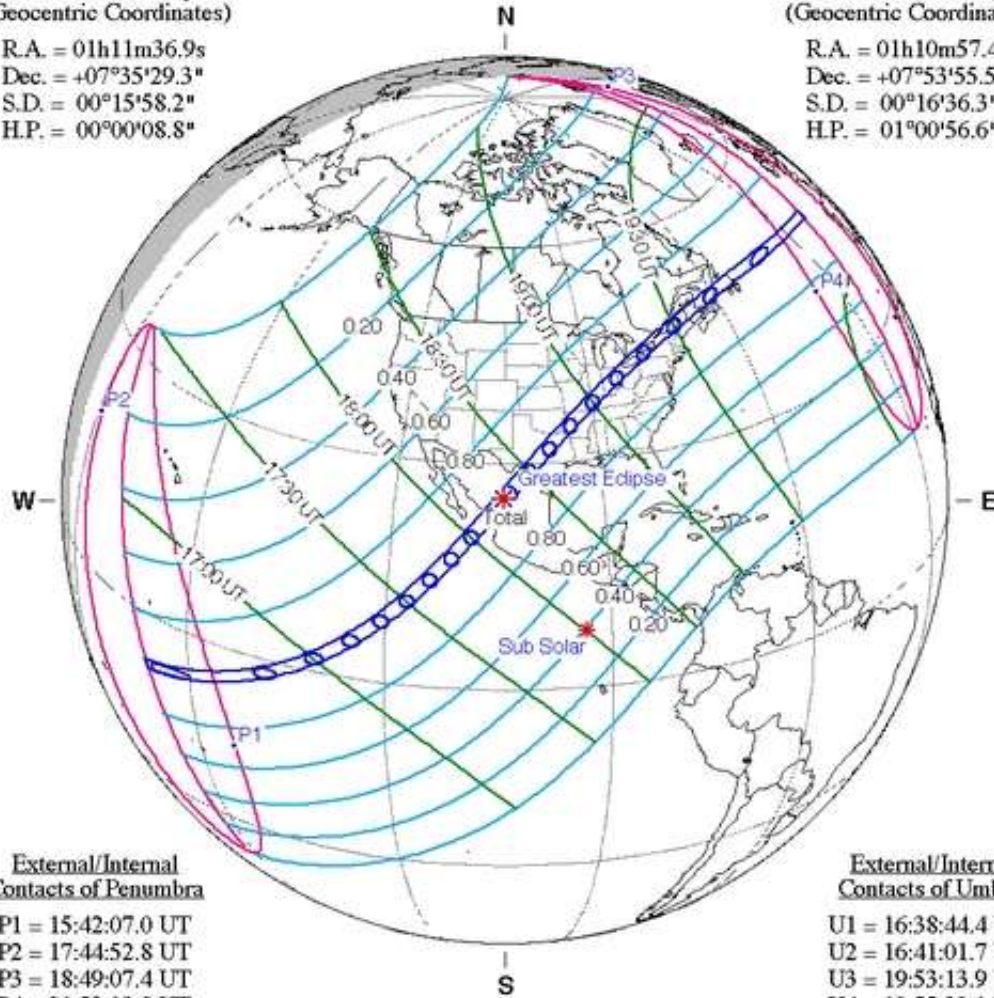
Geocentric Conjunction = 18:36:02.5 UT    J.D. = 2460409.275029  
 Greatest Eclipse = 18:17:13.1 UT    J.D. = 2460409.261957  
 Eclipse Magnitude = 1.0565    Gamma = 0.3432  
 Saros Series = 139    Member = 30 of 71

## Sun at Greatest Eclipse (Geocentric Coordinates)

R.A. = 01h11m36.9s  
 Dec. = +07°35'29.3"  
 S.D. = 00°15'58.2"  
 H.P. = 00°00'08.8"

## Moon at Greatest Eclipse (Geocentric Coordinates)

R.A. = 01h10m57.4s  
 Dec. = +07°53'55.5"  
 S.D. = 00°16'36.3"  
 H.P. = 01°00'56.6"



## External/Internal Contacts of Penumbra

P1 = 15:42:07.0 UT  
 P2 = 17:44:52.8 UT  
 P3 = 18:49:07.4 UT  
 P4 = 20:52:13.8 UT

## Ephemeris & Constants

Eph. = Newcomb/ILE  
 $\Delta T = 81.2$  s  
 $k1 = 0.2724880$   
 $k2 = 0.2722810$   
 $\Delta b = 0.0''$      $\Delta l = 0.0''$

## Local Circumstances at Greatest Eclipse

Lat. = 25°17.5'N    Sun Alt. = 69.8°  
 Long. = 104°07.2'W    Sun Azm. = 149.4°  
 Path Width = 197.5 km    Duration = 04m28.1s

## External/Internal Contacts of Umbra

U1 = 16:38:44.4 UT  
 U2 = 16:41:01.7 UT  
 U3 = 19:53:13.9 UT  
 U4 = 19:55:29.1 UT

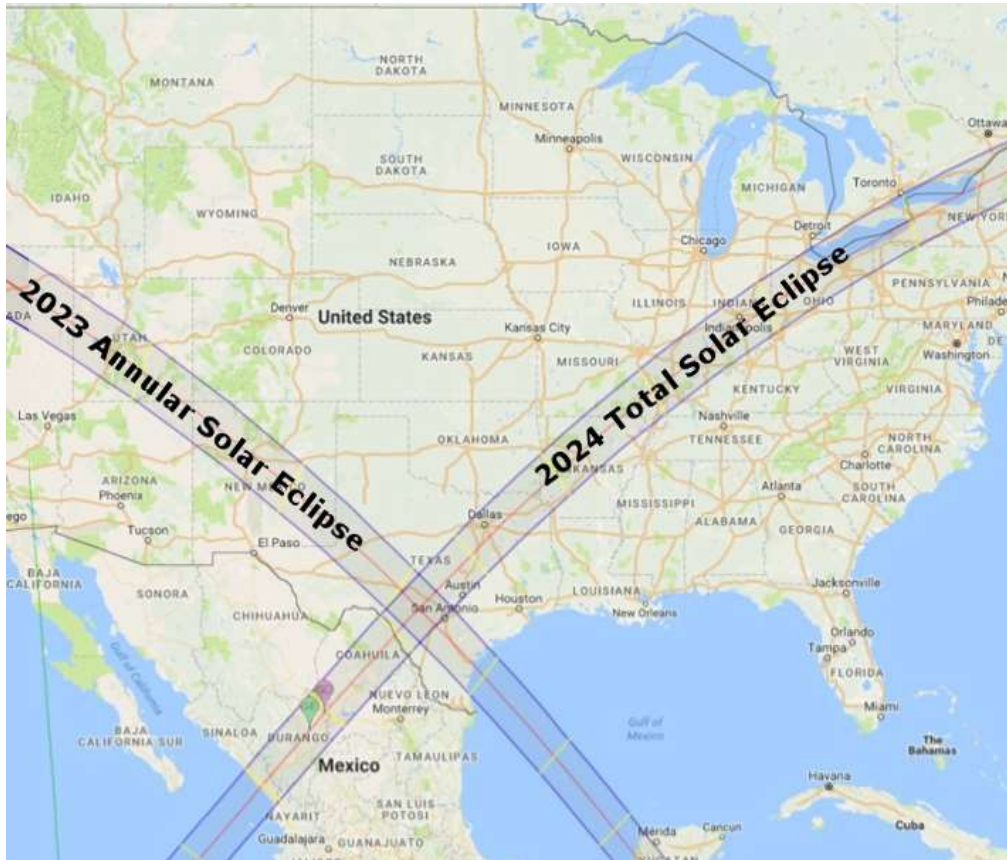
## Geocentric Libration (Optical + Physical)

$l = 2.00''$   
 $b = -0.46''$   
 $c = -20.75''$

Brown Lun. No. = 1253



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[sunearth.gsfc.nasa.gov/eclipse/eclipse.html](http://sunearth.gsfc.nasa.gov/eclipse/eclipse.html)



**Overplot of the Oct. 14, 2023 annular eclipse (upper left to lower right) with the total solar eclipse of Apr. 8, 2024 (lower left to upper right)**

