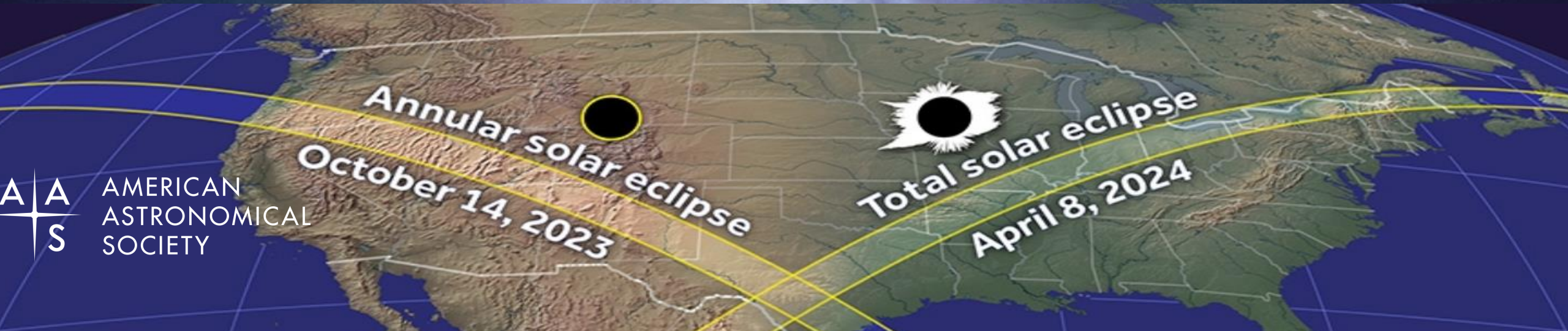


# WHAT TO EXPECT IN 2023 & 2024



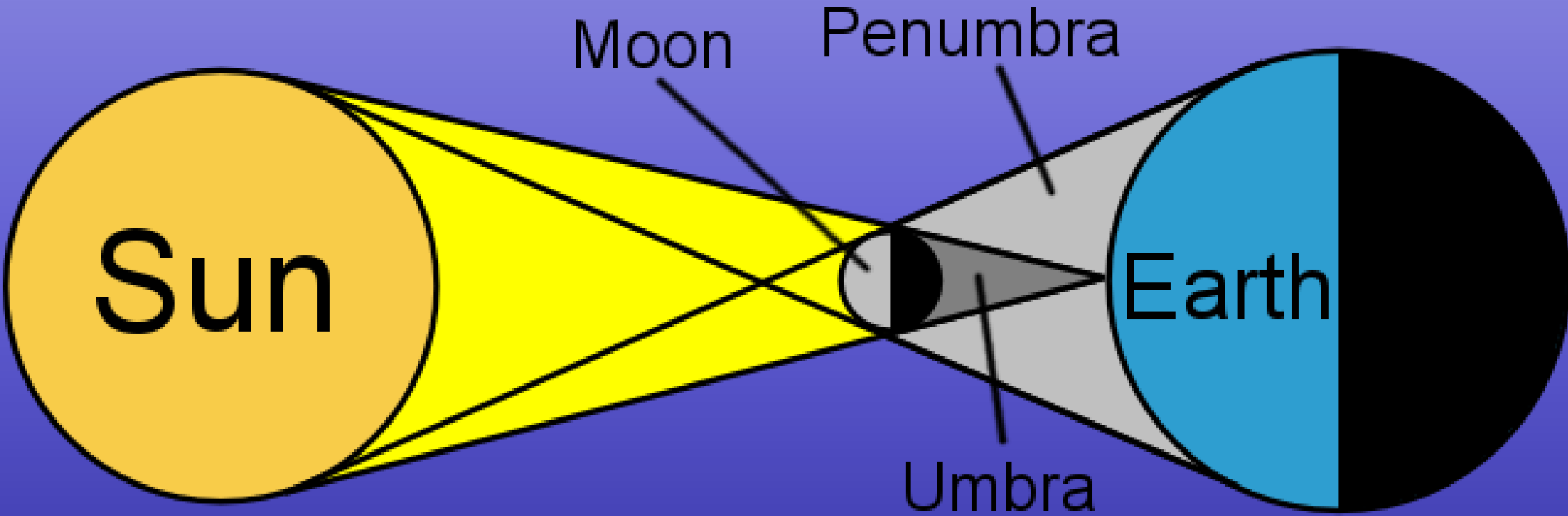




**ANNULAR SOLAR ECLIPSE**  
**OCTOBER 14, 2023**

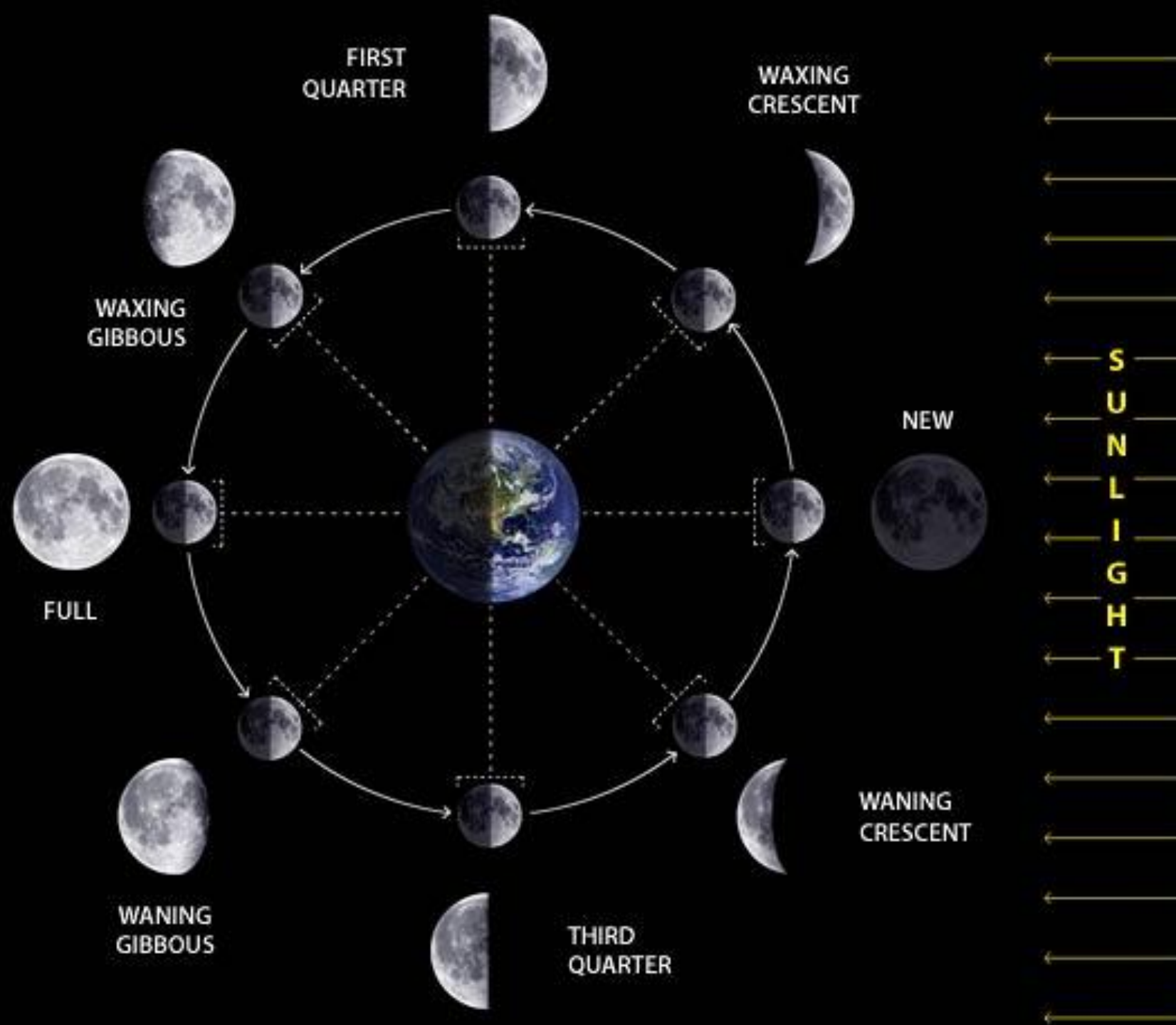
**APRIL 8, 2024**  
**TOTAL SOLAR ECLIPSE**

Solar eclipses occur when the Moon gets between the Sun and the Earth





# Lunar phases







The diagram shows the Moon's orbit around Earth. In this configuration, the Moon is positioned directly between the Sun and Earth, which is the alignment required for a solar eclipse.

**No Solar Eclipse**

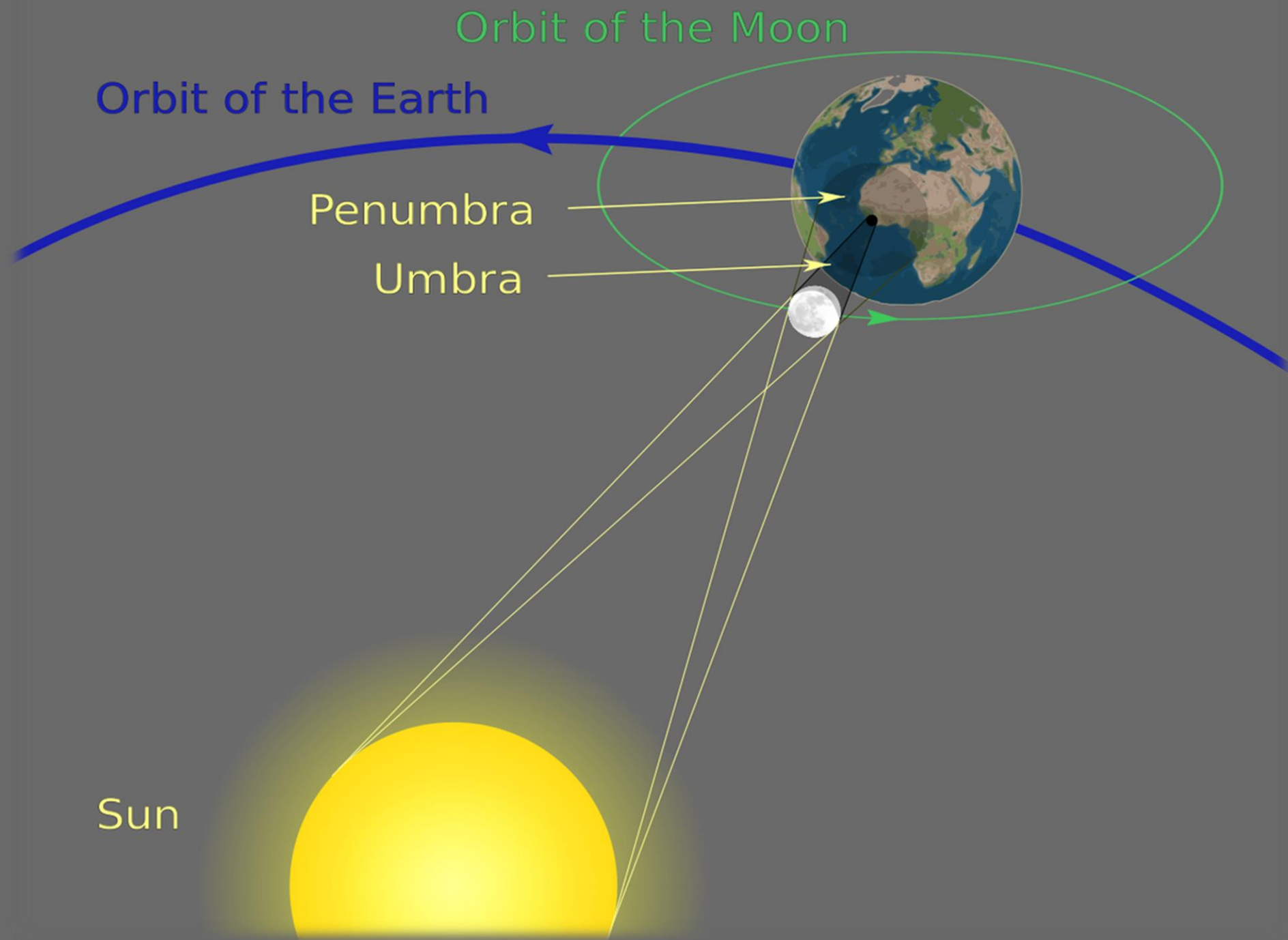


The diagram shows the Moon's orbit around Earth. In this configuration, the Earth is positioned directly between the Sun and the Moon, which is the alignment required for a lunar eclipse.

**No Lunar Eclipse**

**Solar Eclipse**

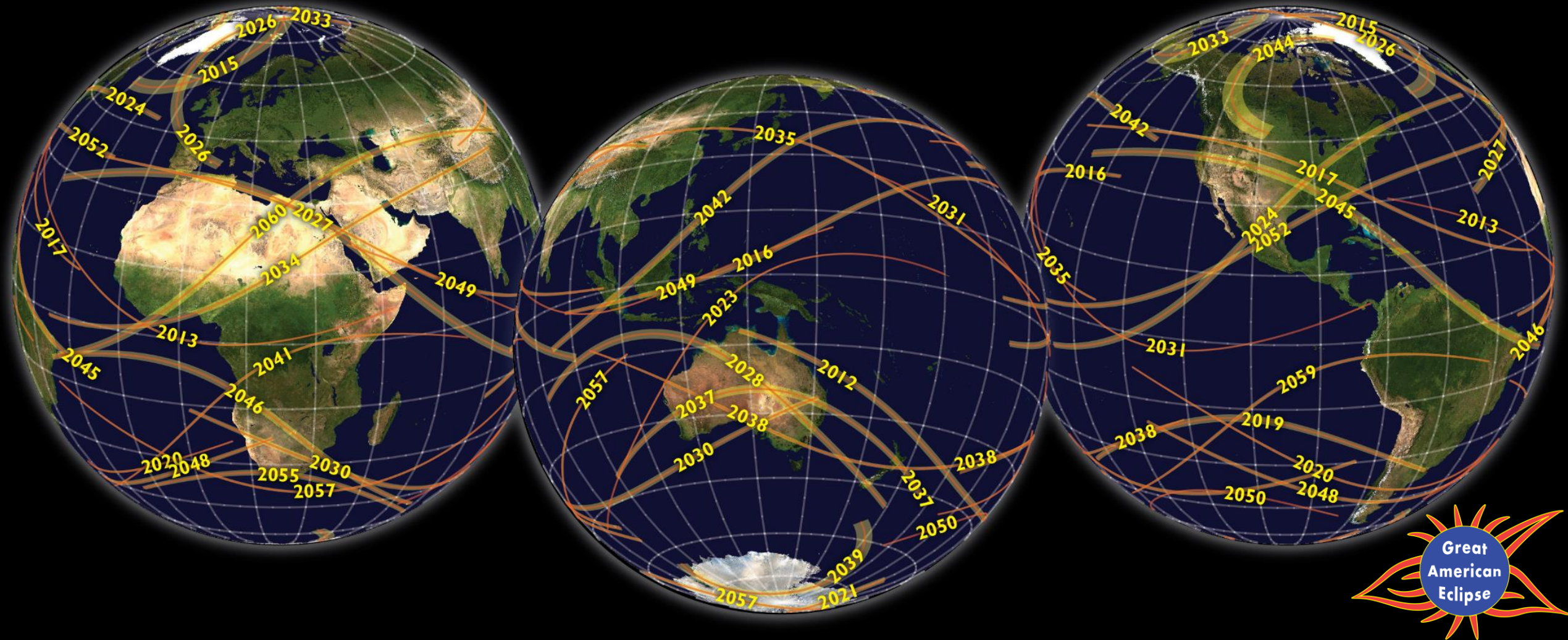
**Lunar Eclipse**





# Every total eclipse on the planet in 50 years (2010-2060)

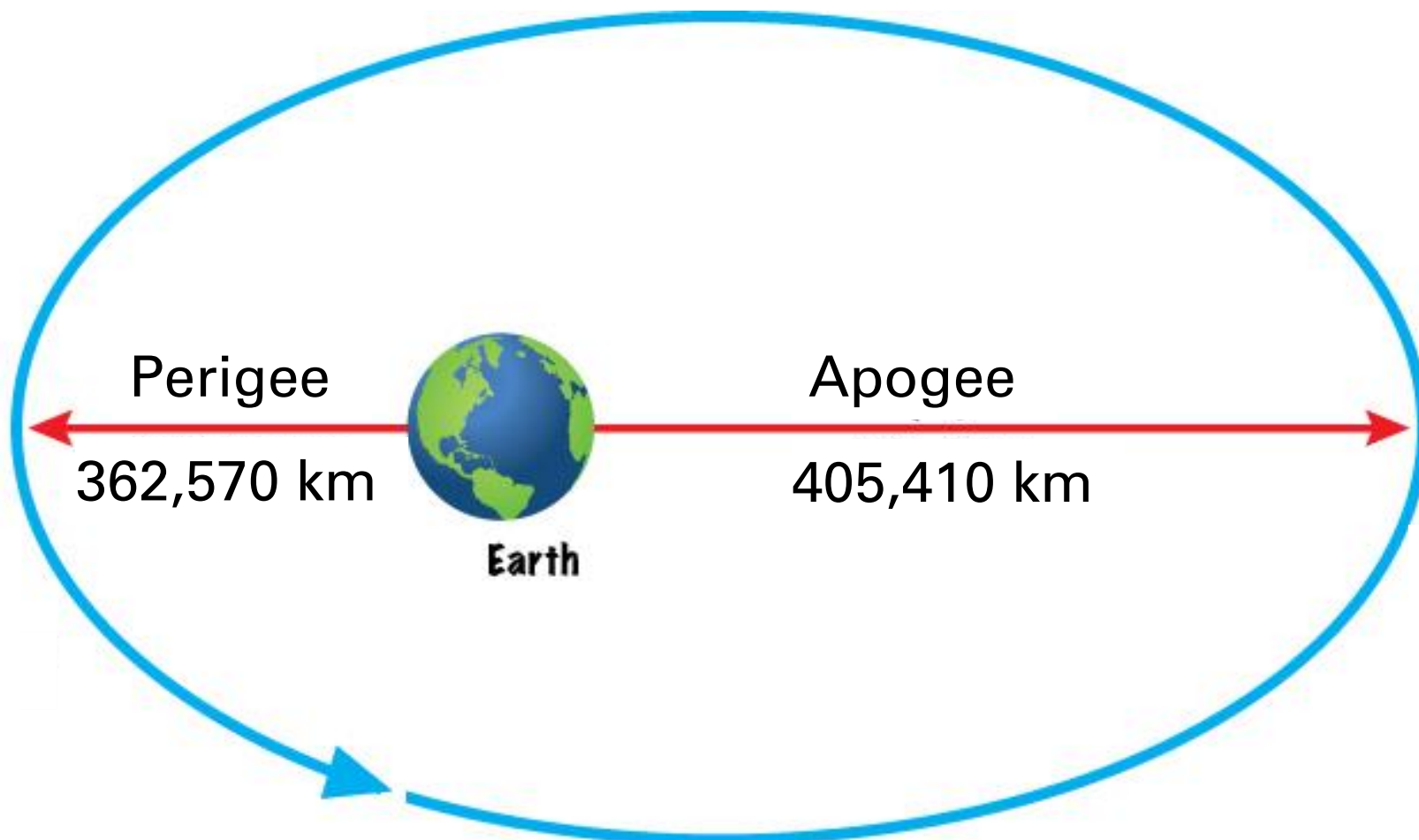
Each total eclipse is seen by one thousandth of the Earth's surface. Most of the planet does not see a total eclipse in 50 years.



# Annular eclipses





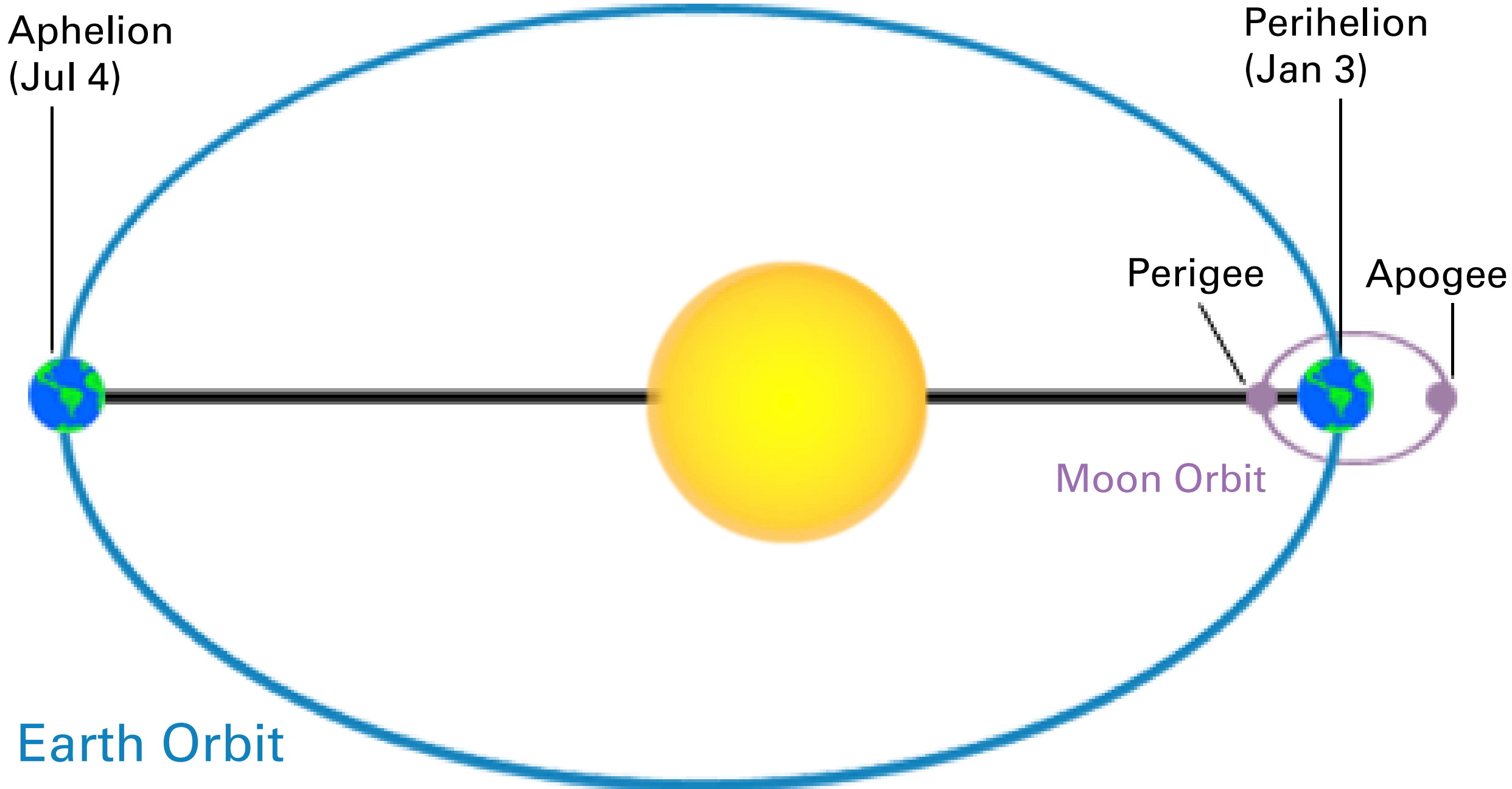


At perigee, the Moon is closer to the Earth and looks slightly larger



At apogee, the Moon is farther from the Earth and looks slightly smaller

Moon's Orbit is elliptical (greatly exaggerated here)



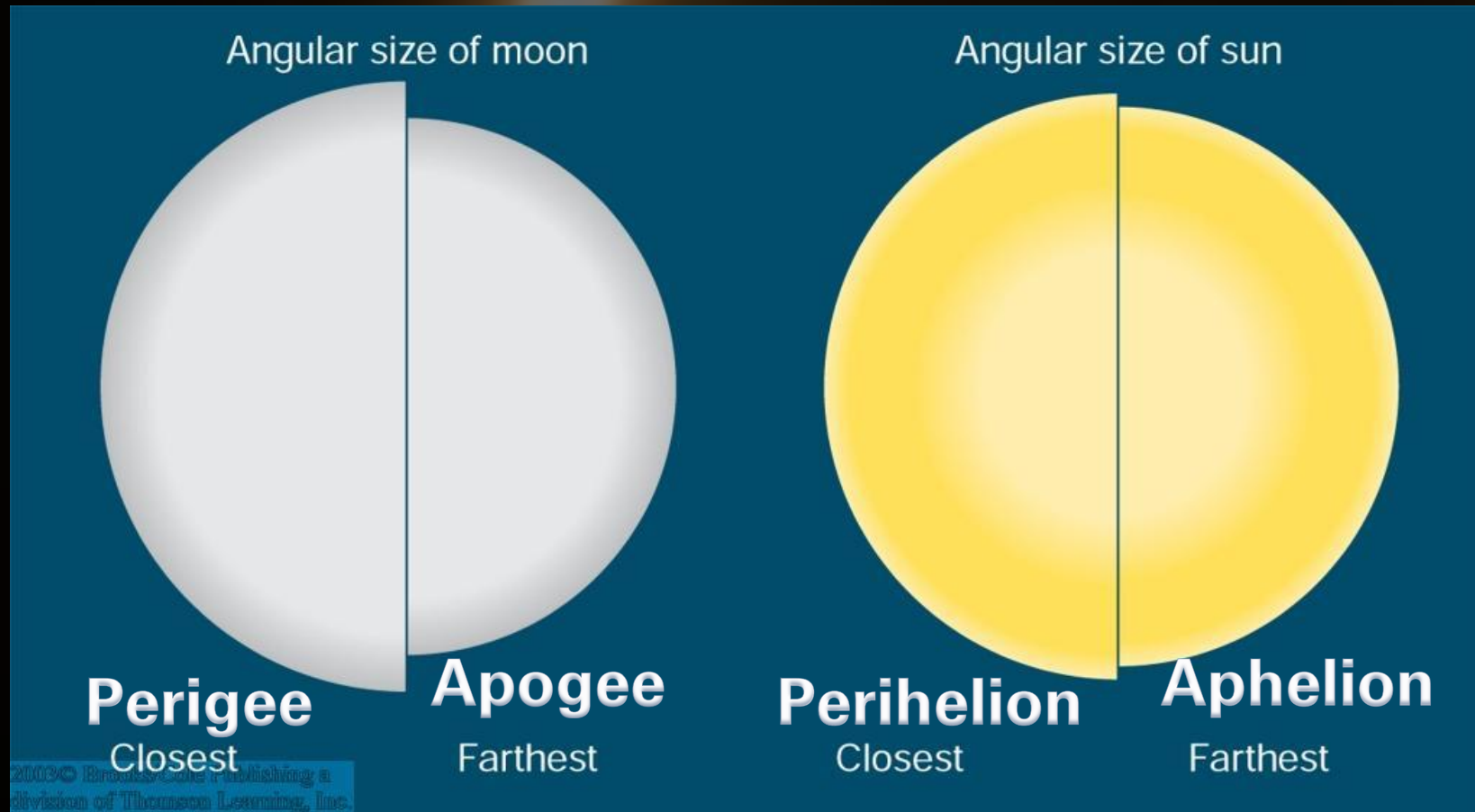


# Annular Solar Eclipses

When Earth is near perihelion, and the moon is near apogee, we see an annular solar eclipse.



The angular sizes of the moon and the sun vary, depending on their distance from Earth.

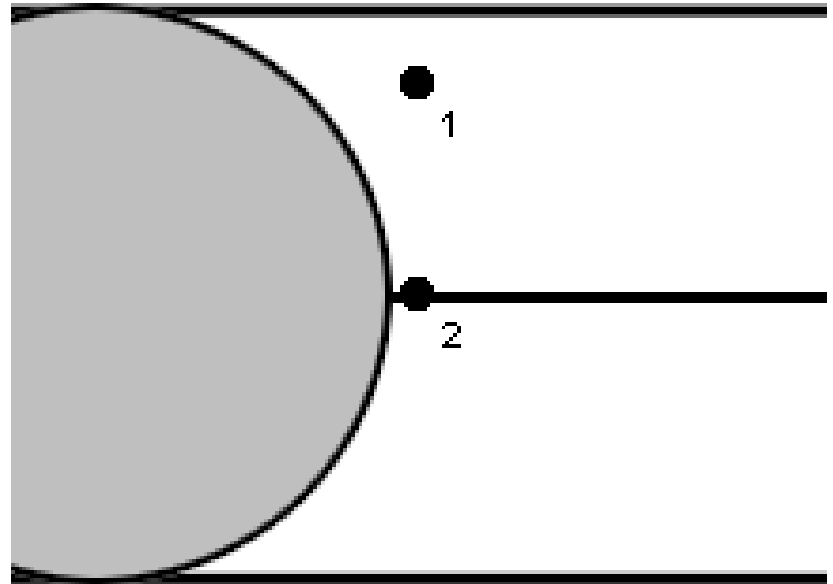
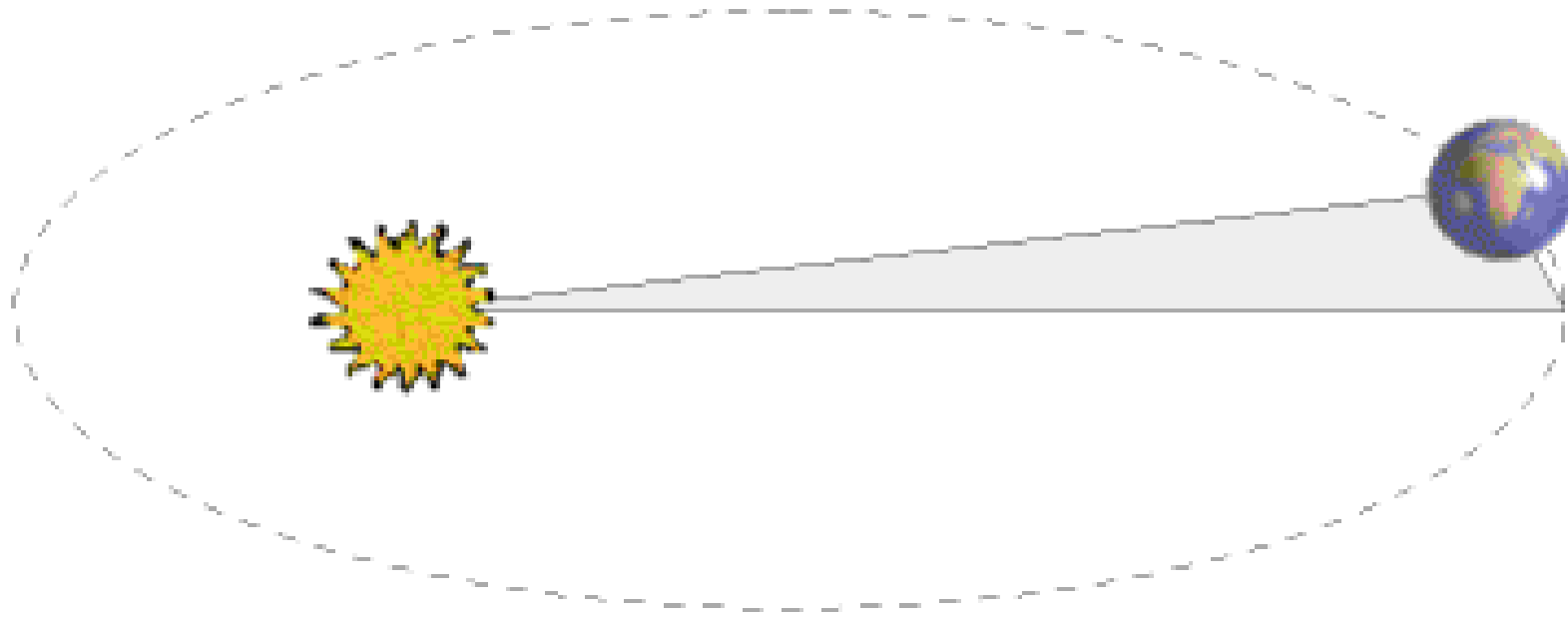




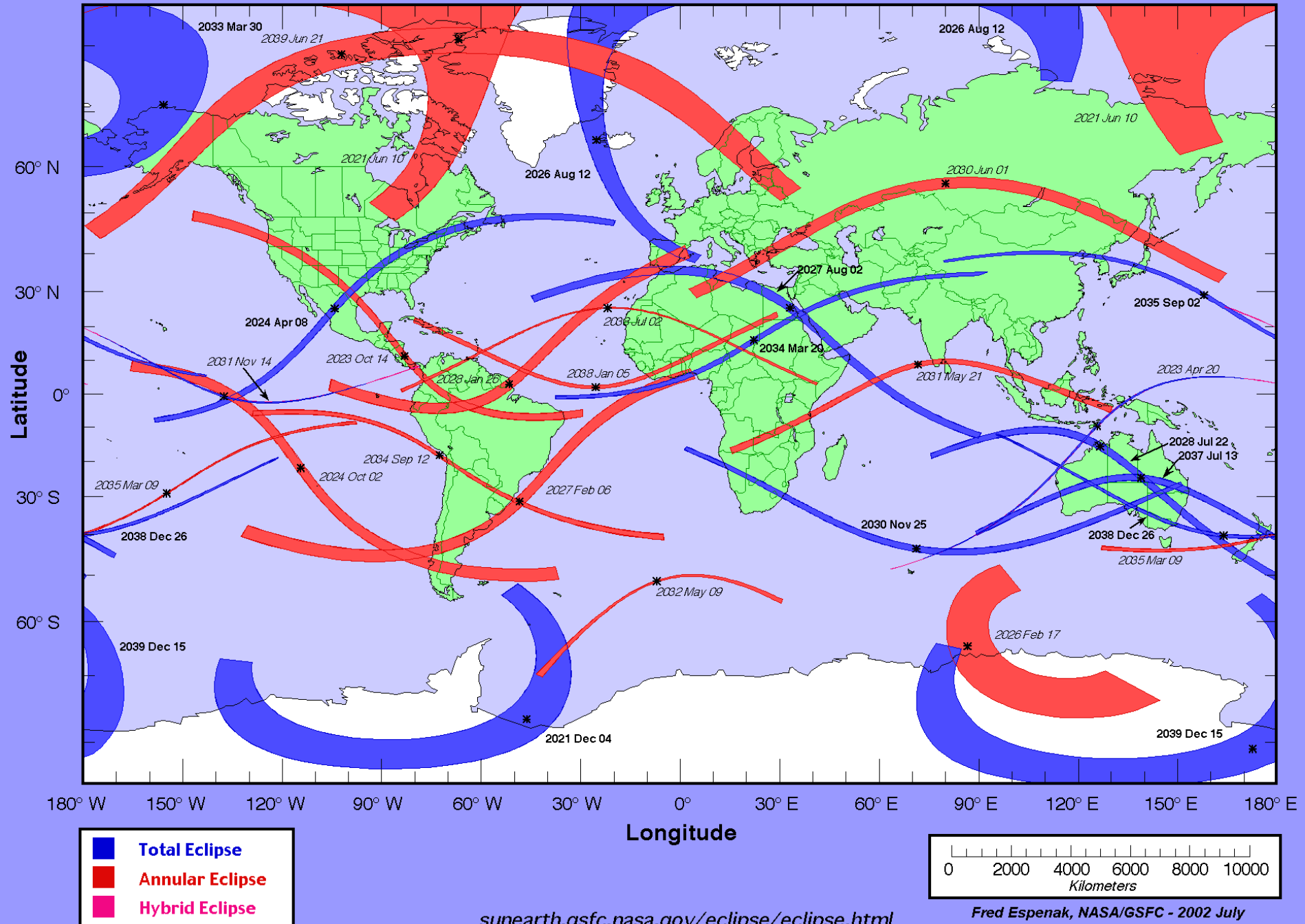


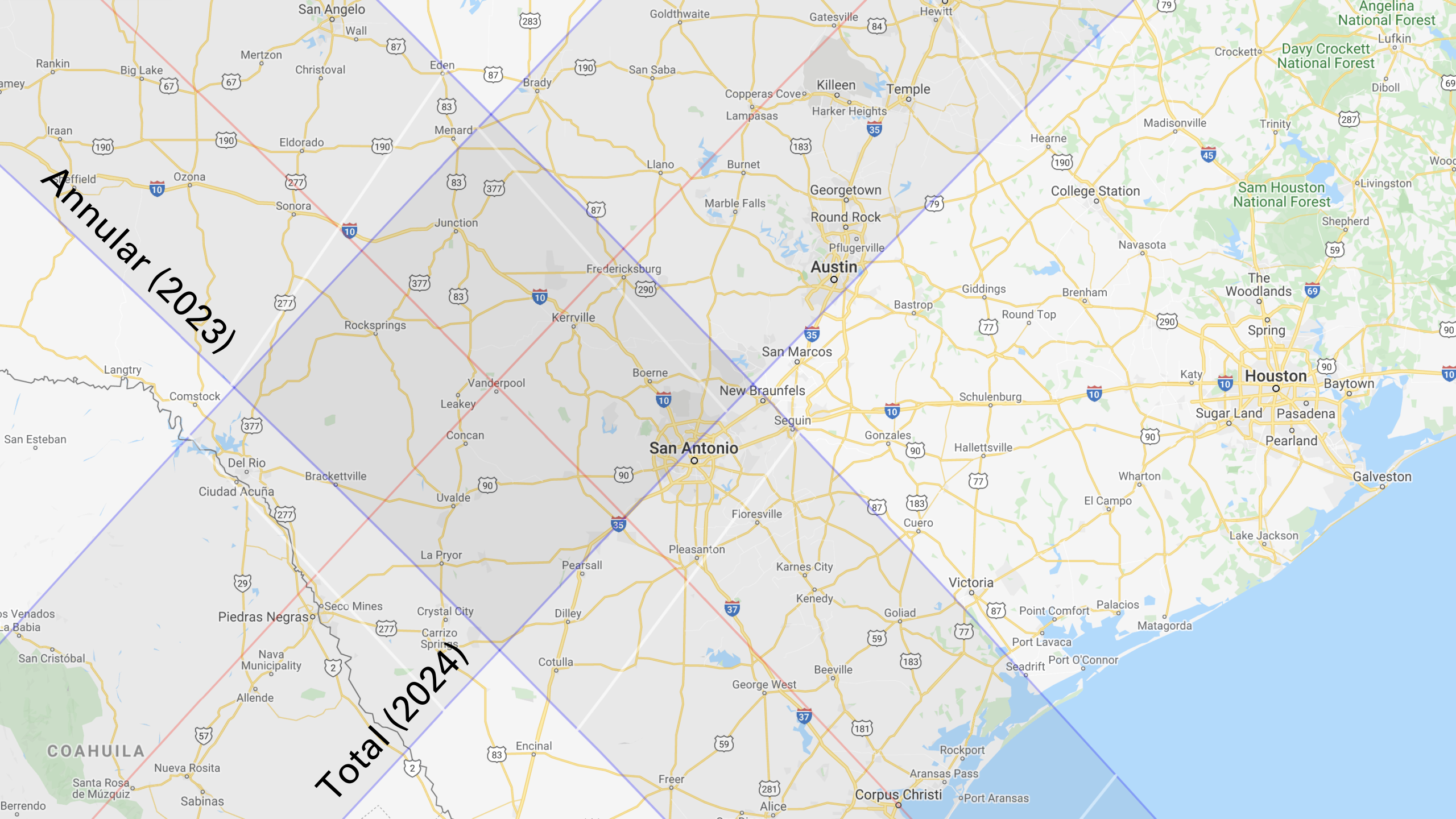


# How long do eclipses last?



# Total and Annular Solar Eclipse Paths: 2021 –2040







October  
14<sup>th</sup> 2023



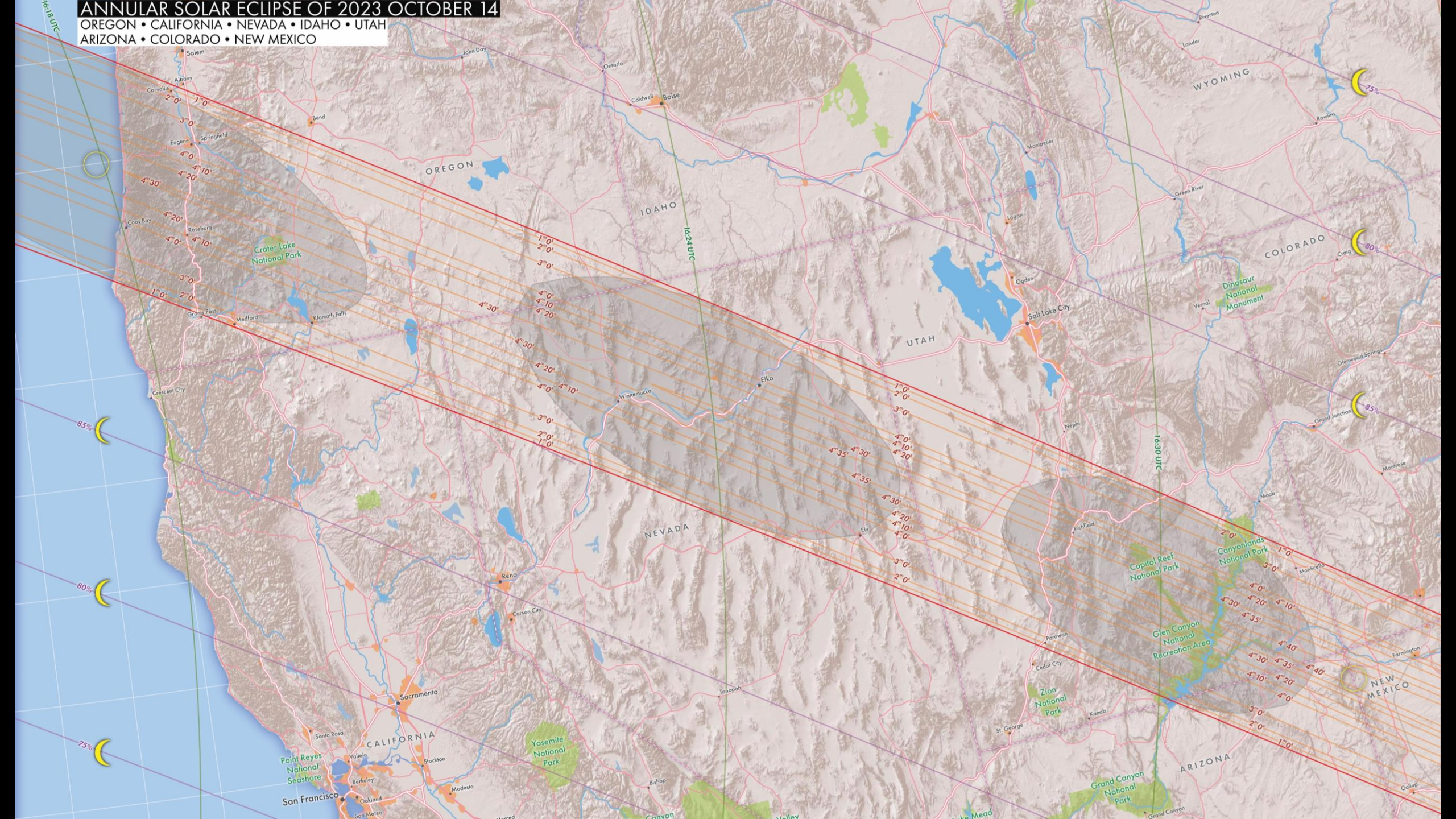






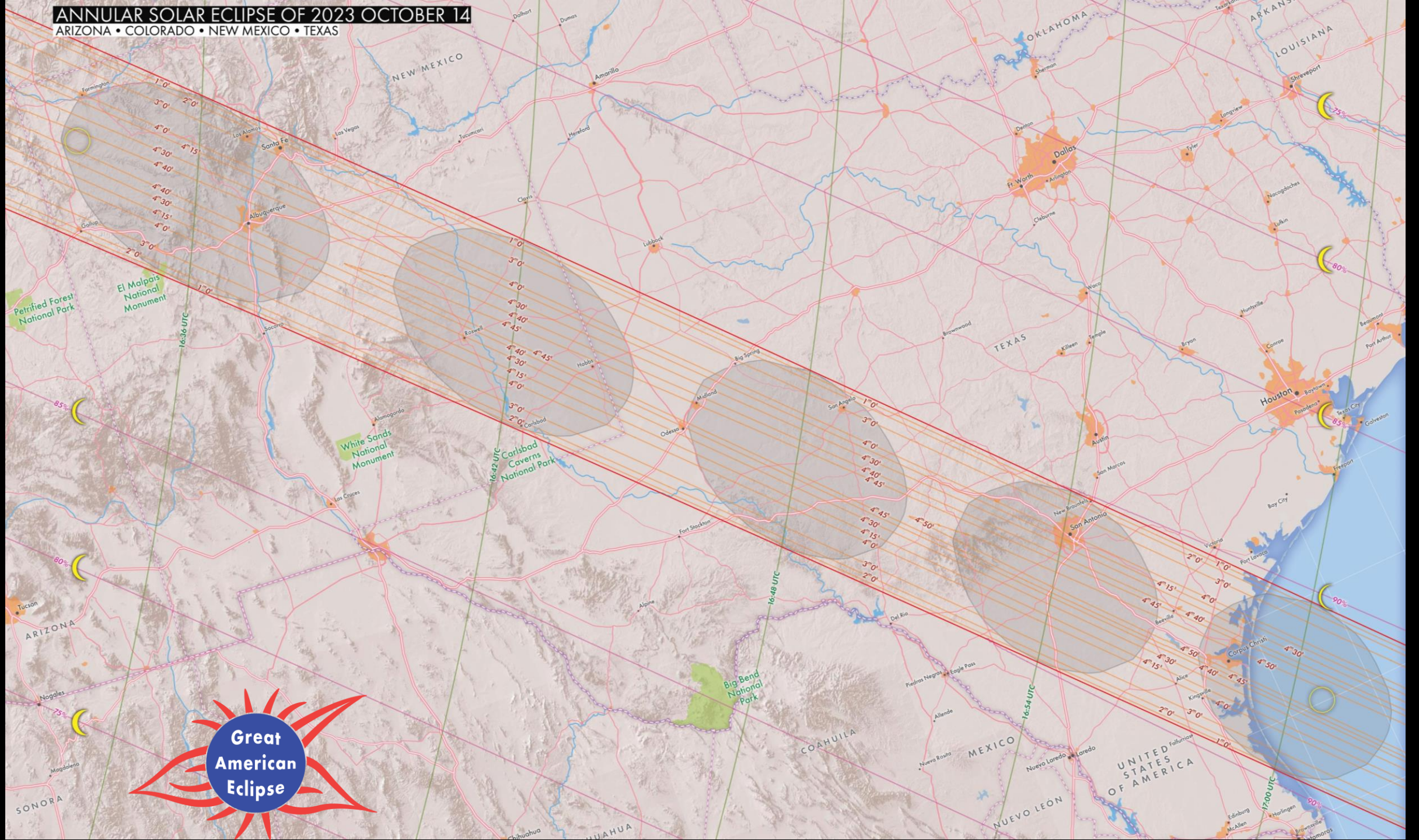
# ANNULAR SOLAR ECLIPSE OF 2023 OCTOBER 14

OREGON • CALIFORNIA • NEVADA • IDAHO • UTAH  
ARIZONA • COLORADO • NEW MEXICO



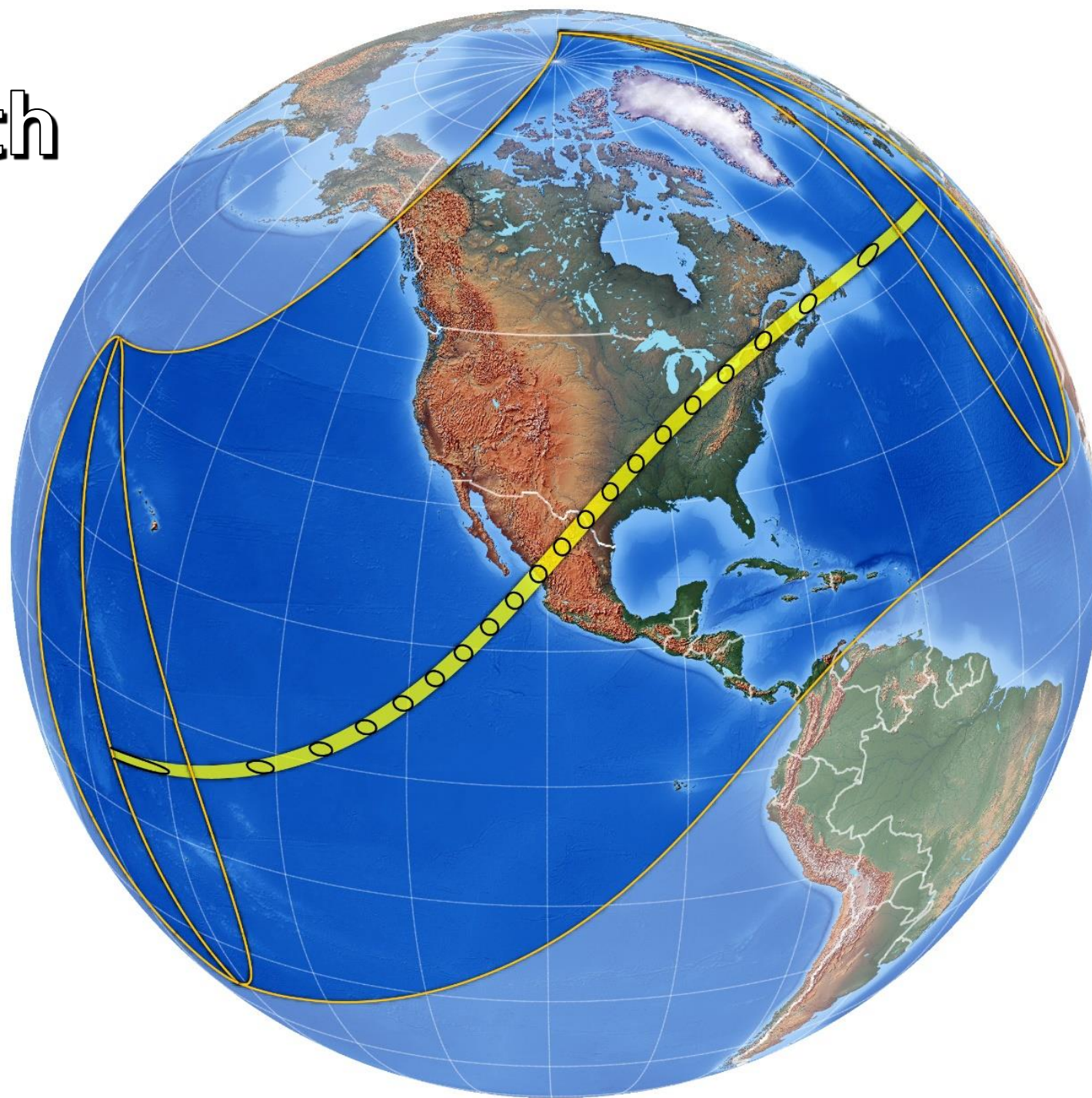


ANNULAR SOLAR ECLIPSE OF 2023 OCTOBER 14  
ARIZONA • COLORADO • NEW MEXICO • TEXAS

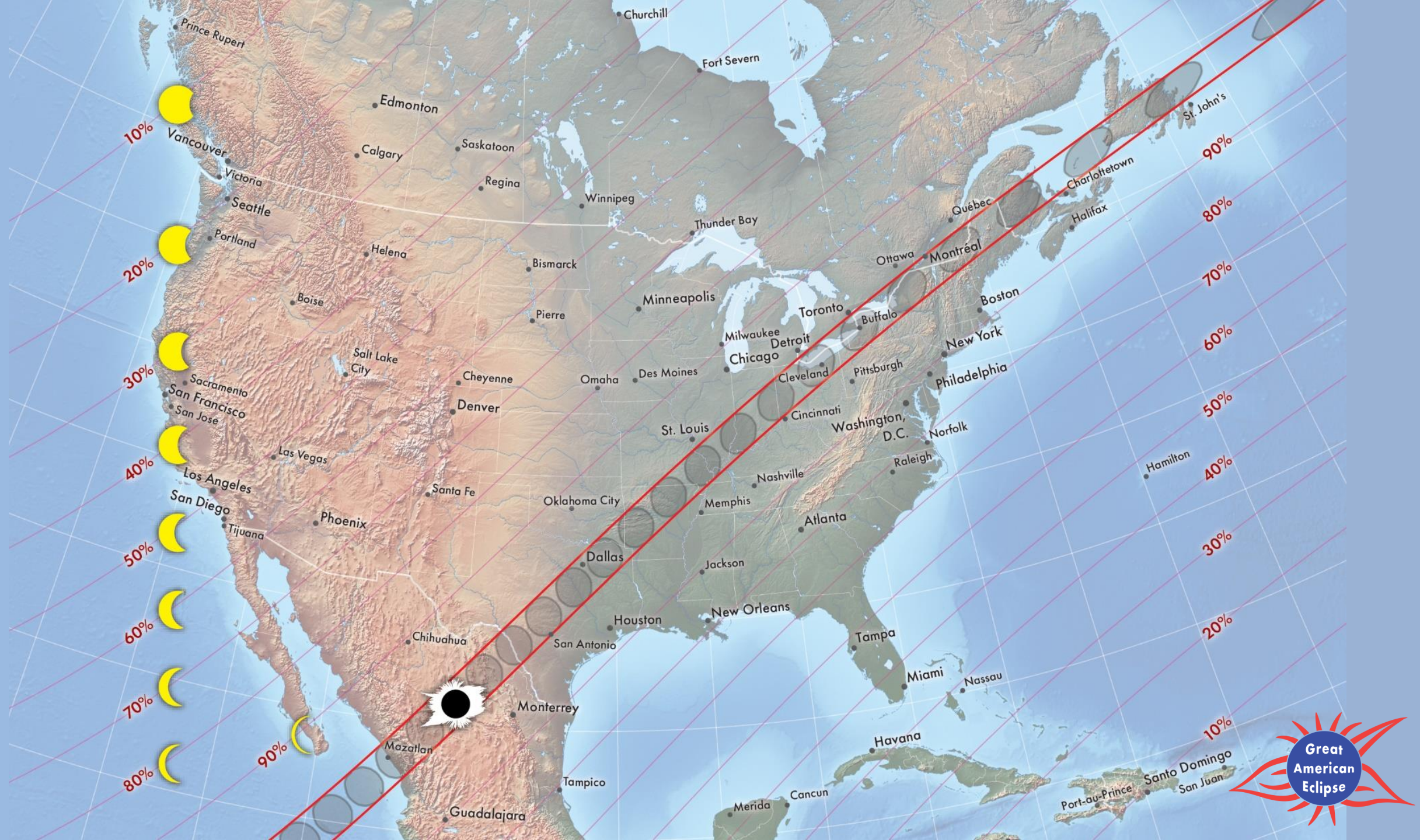




April 8<sup>th</sup>  
2024









# Cities inside the path of the Total Solar Eclipse of April 8, 2024



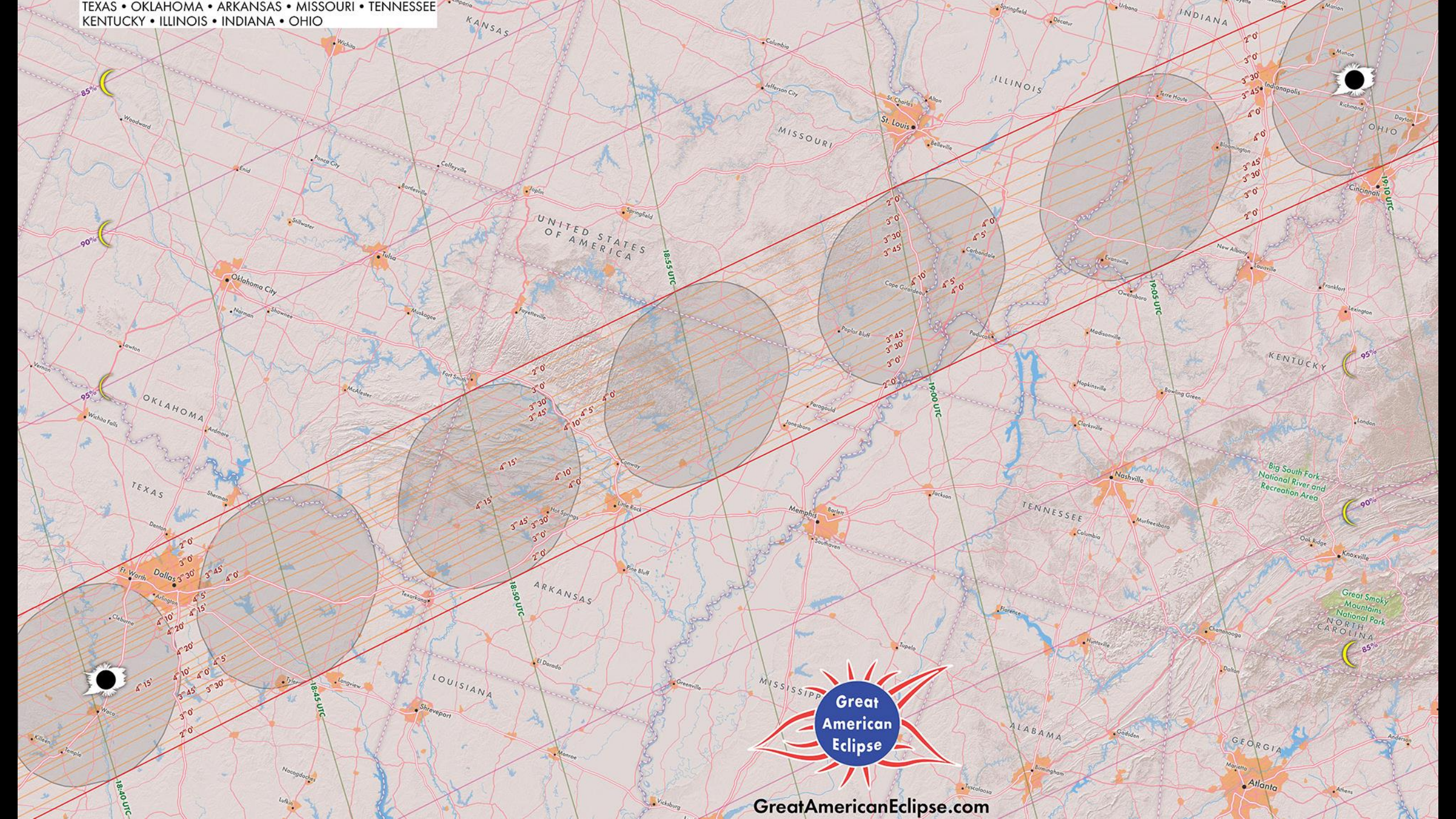
[GreatAmericanEclipse.com](http://GreatAmericanEclipse.com)







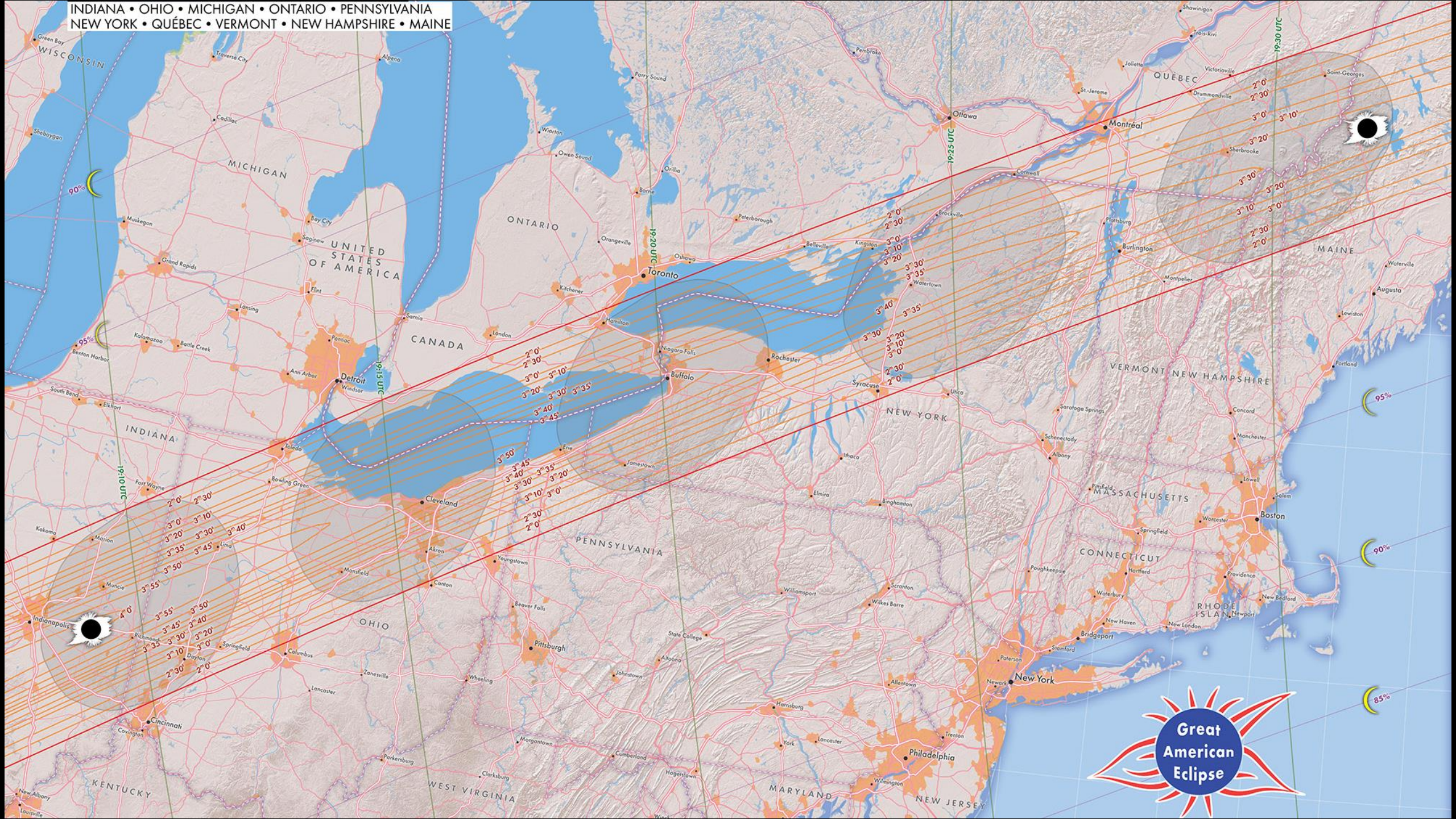
TEXAS • OKLAHOMA • ARKANSAS • MISSOURI • TENNESSEE  
KENTUCKY • ILLINOIS • INDIANA • OHIO



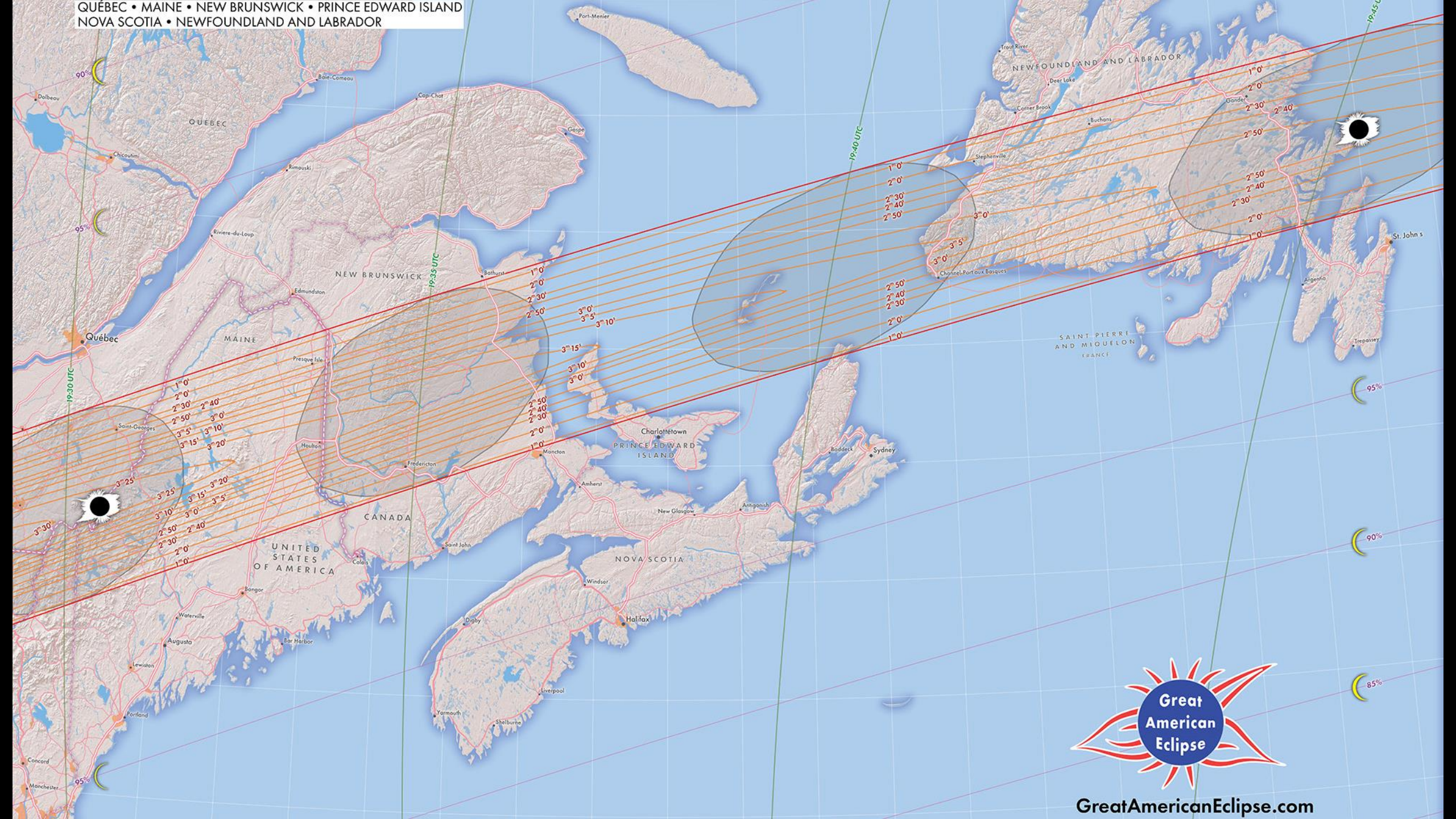
GreatAmericanEclipse.com



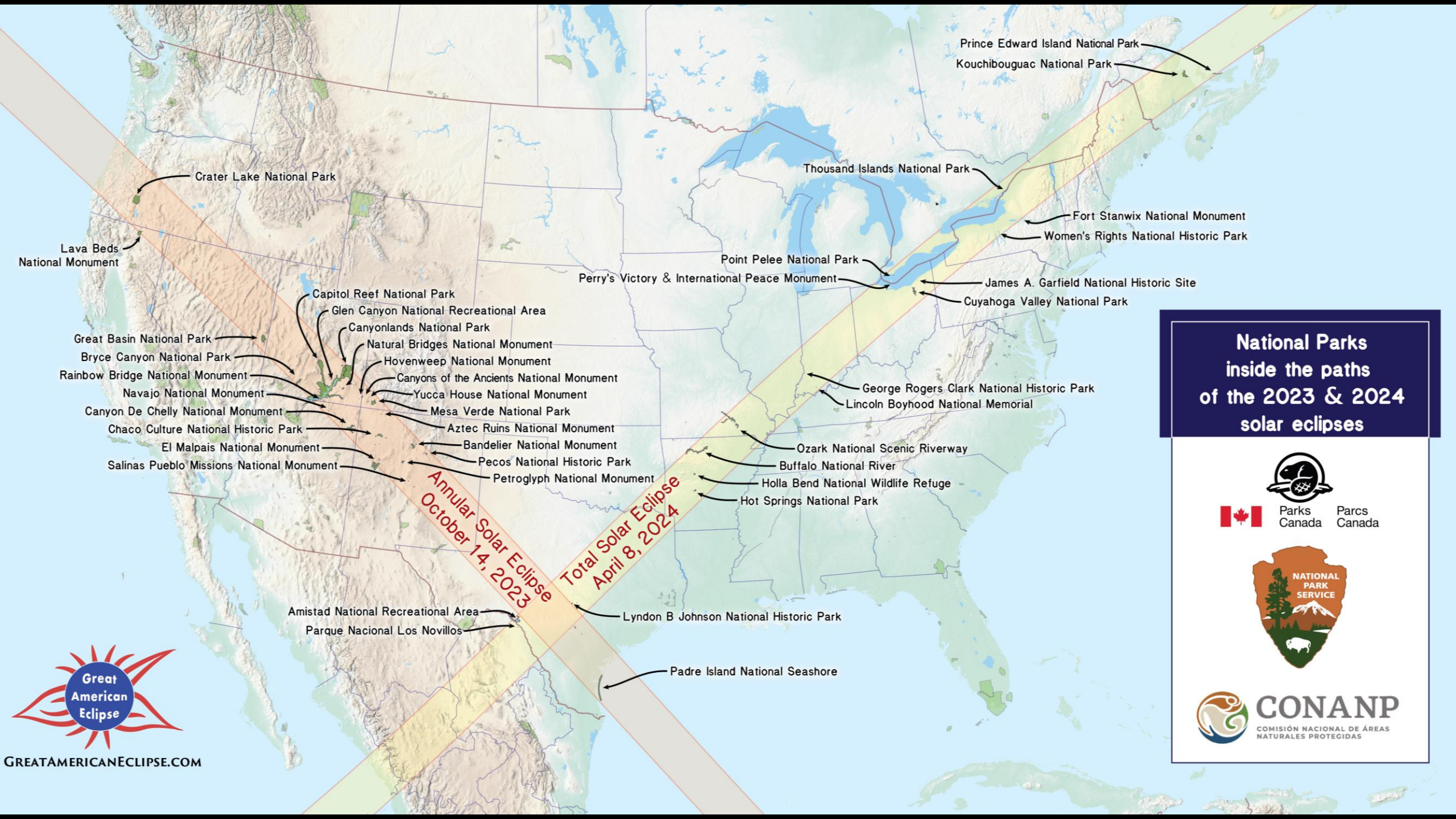
INDIANA • OHIO • MICHIGAN • ONTARIO • PENNSYLVANIA  
NEW YORK • QUÉBEC • VERMONT • NEW HAMPSHIRE • MAINE









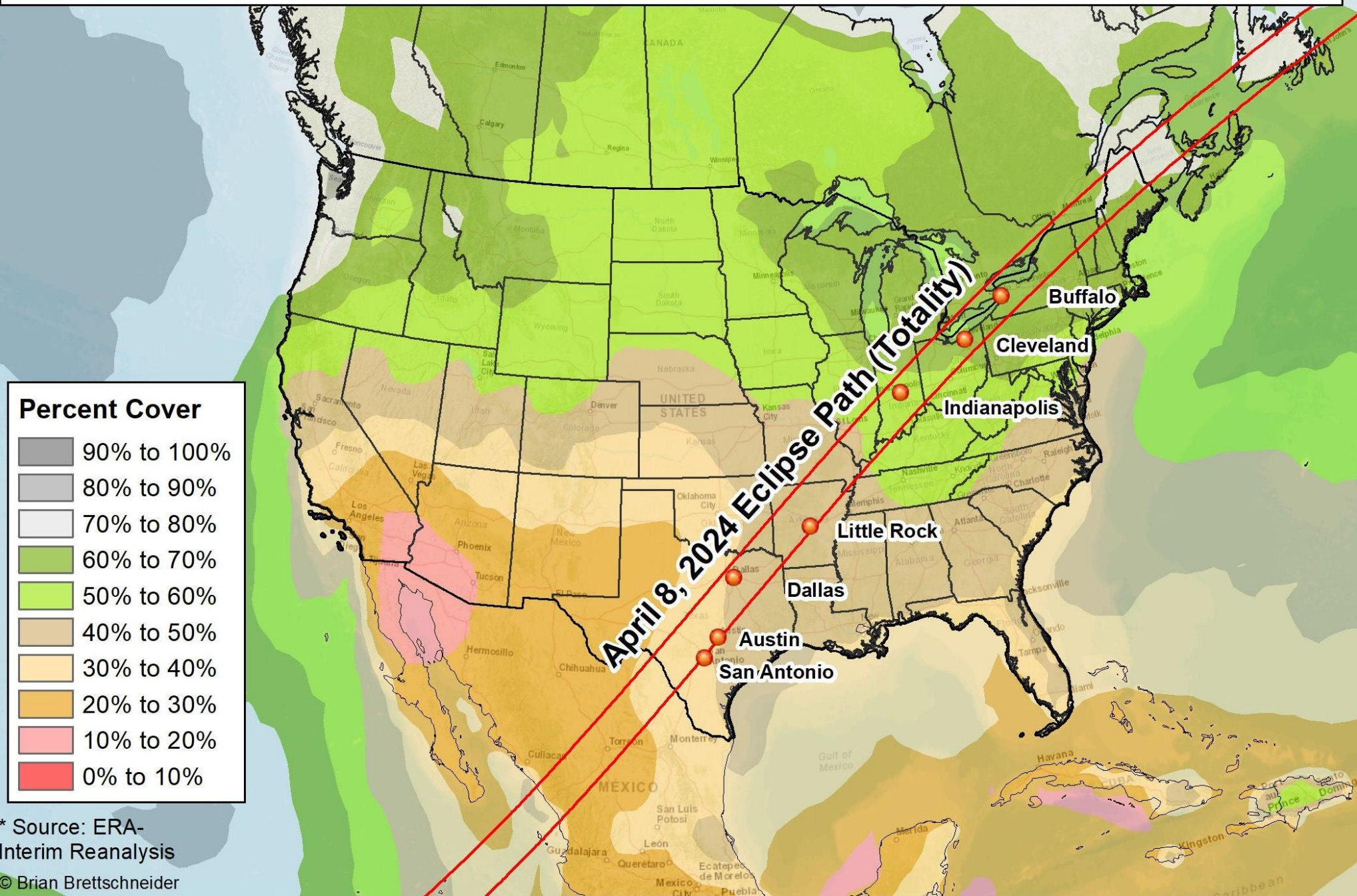


## National Parks inside the paths of the 2023 & 2024 solar eclipses





# Cloud Coverage Climatology at 18 UTC Between April 3 and Apr 13 (1979-2016)\*



\* Source: ERA-Interim Reanalysis

© Brian Brettschneider



# Total Solar Eclipse as seen from Madras, OR, August 21<sup>st</sup> 2017.

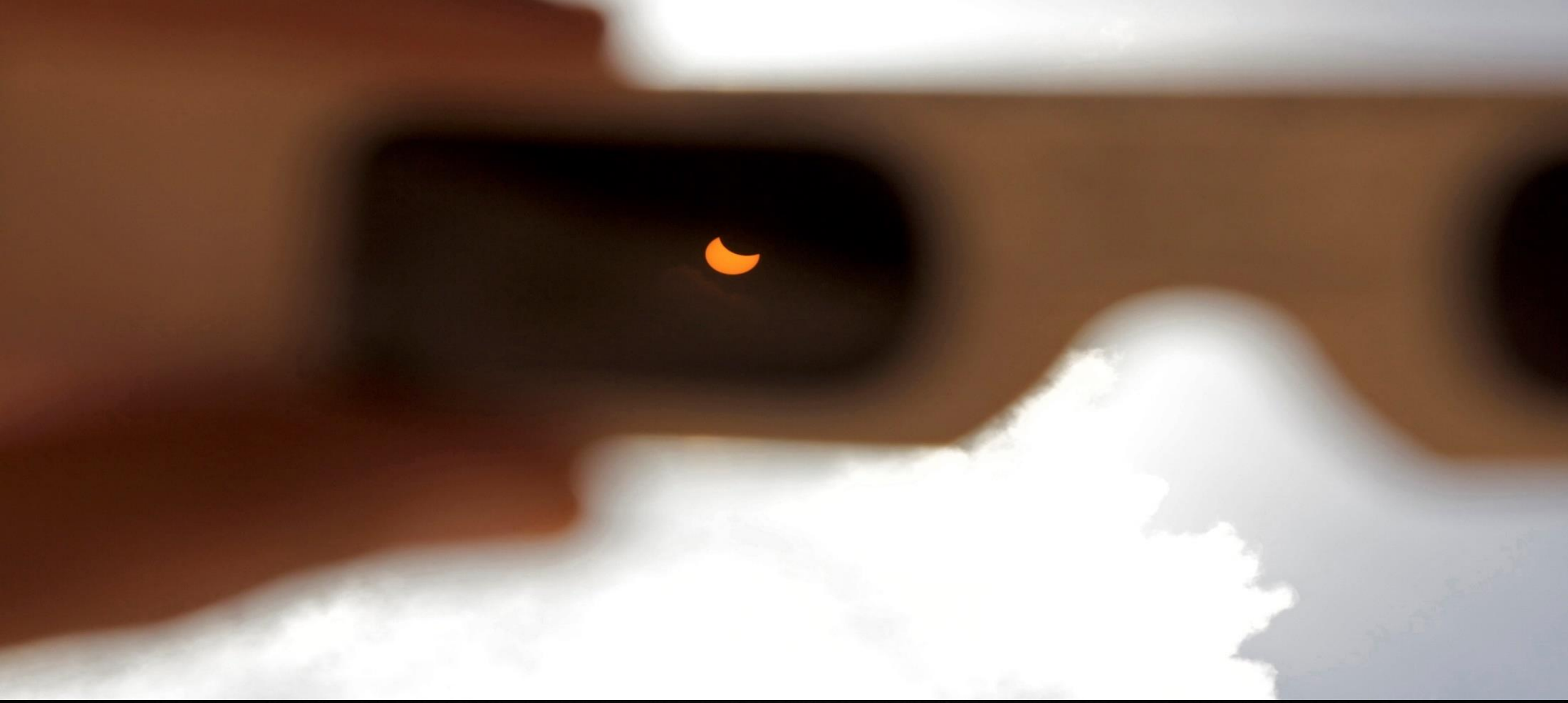


CREDIT: Rick Fienberg  
(former AAS Press Officer)





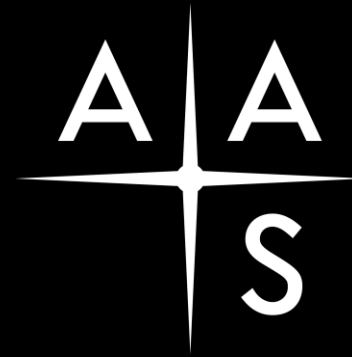
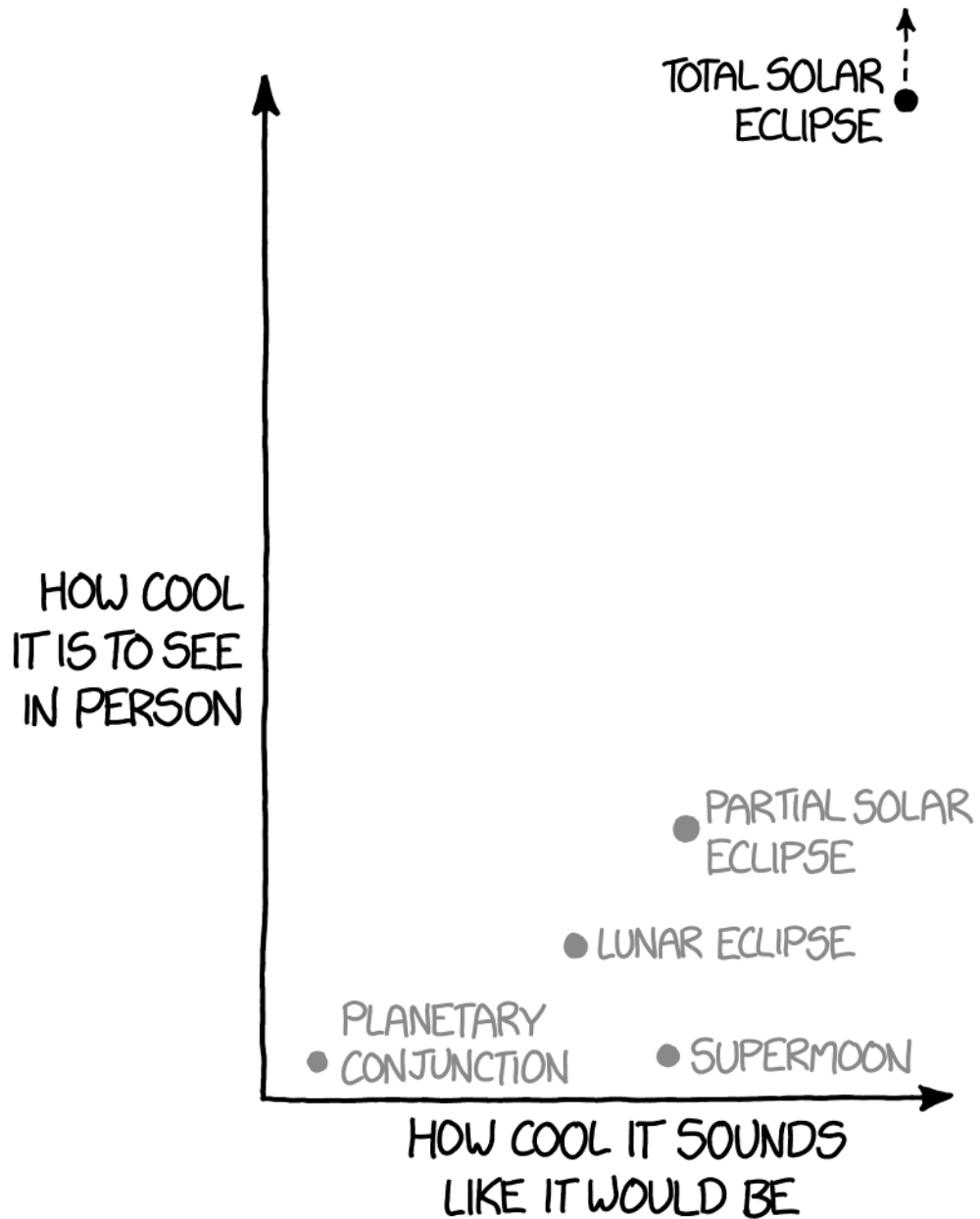












AMERICAN  
ASTRONOMICAL  
SOCIETY

<https://eclipse.aas.org/>





Annular Eclipse: 554 days

Total Eclipse: 731 days (2 years!)

# AMERICAN SOLAR ECLIPSES

TOTAL SOLAR ECLIPSE OF  
2017 AUGUST 21

ANNULAR SOLAR ECLIPSE OF  
2021 JUNE 10

ANNULAR SOLAR ECLIPSE OF  
2023 OCTOBER 14

TOTAL SOLAR ECLIPSE OF  
2024 APRIL 8









