

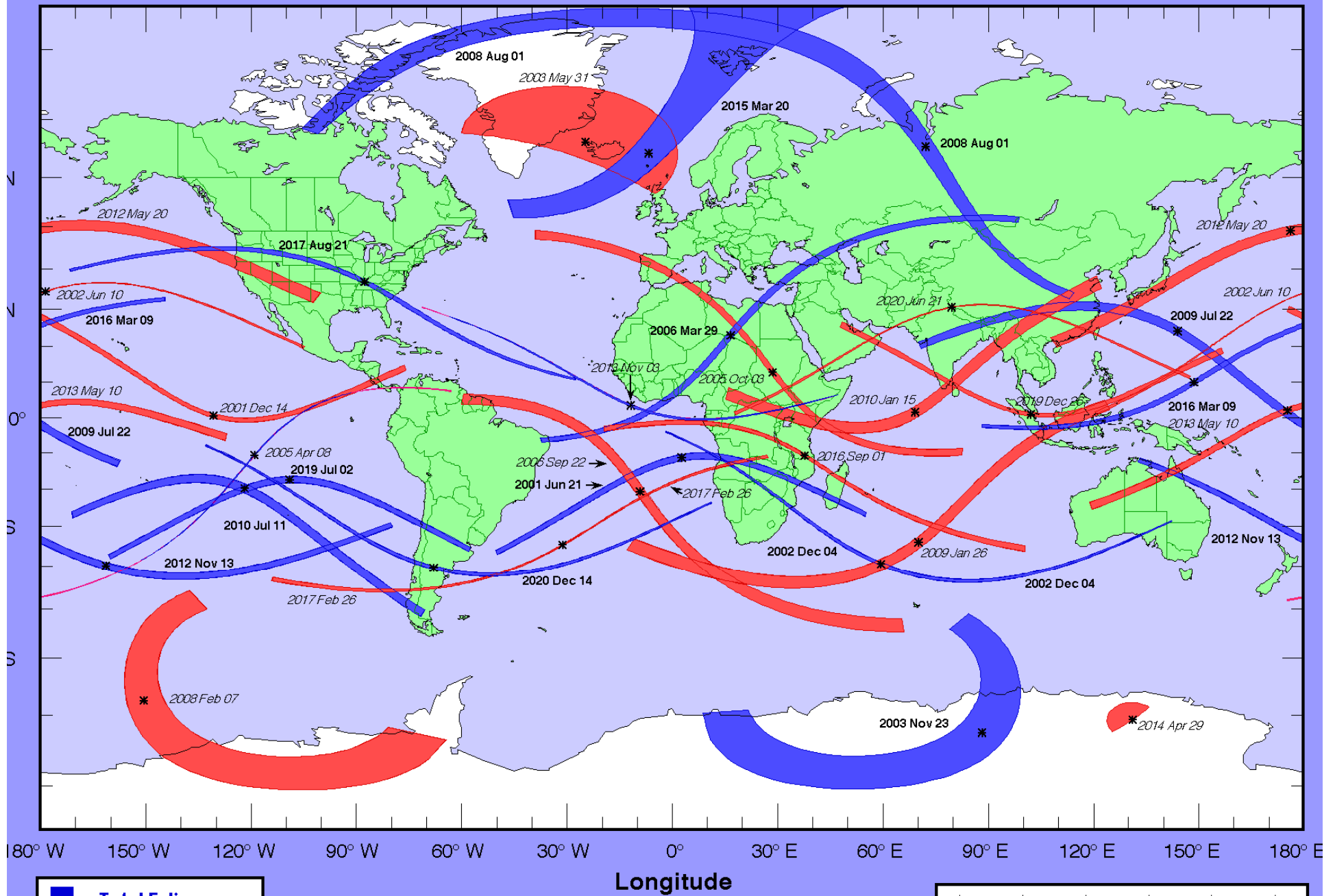


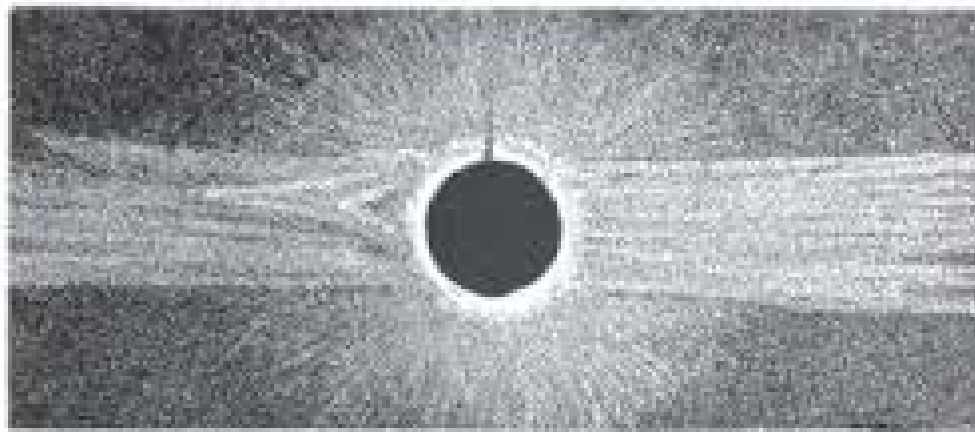
How many of you have seen a  
TOTAL solar eclipse?

It has been almost 40 years  
since a ***TOTAL*** eclipse came to  
the US...



# Total and Annular Solar Eclipse Paths: 2001 – 2020





THE CORONAL STREAMERS OF 1878 (LANGLEY)

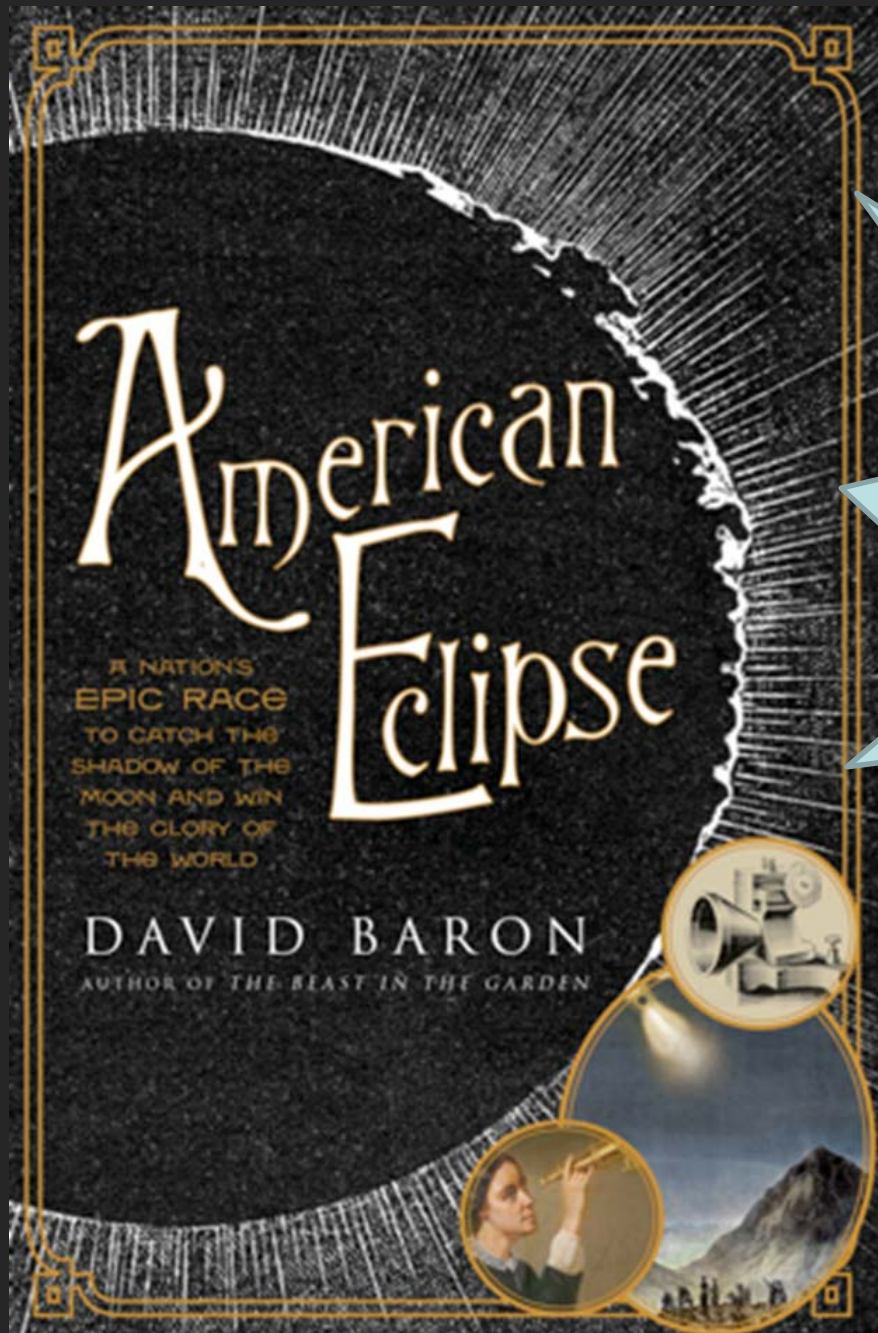


Maria Mitchell Association

Young Tom  
Edison...



Maria Mitchell Association



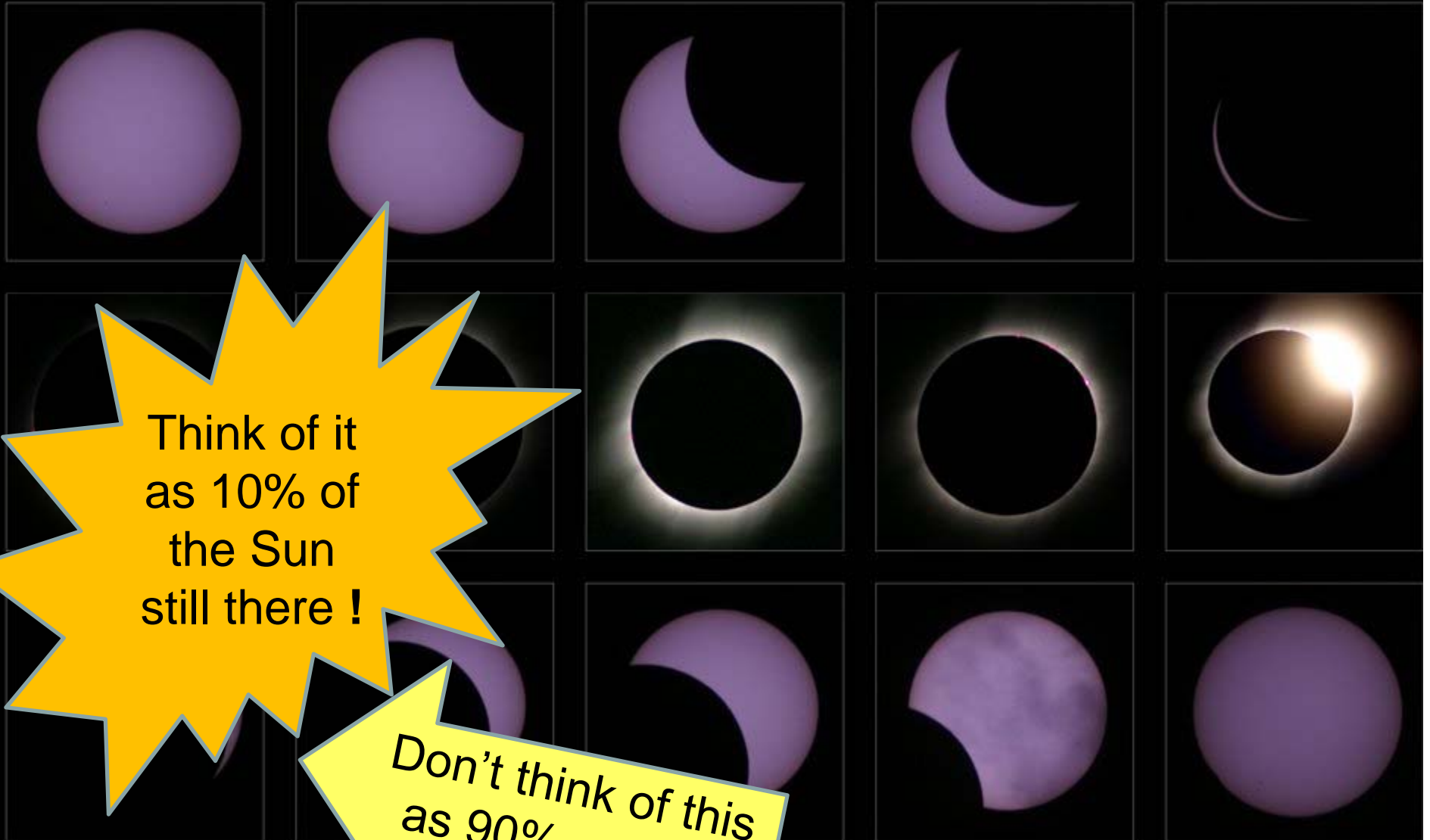
May 7, at  
Fiske  
Planetarium,  
CU

What you will see...

Outside of totality

In the total eclipse band

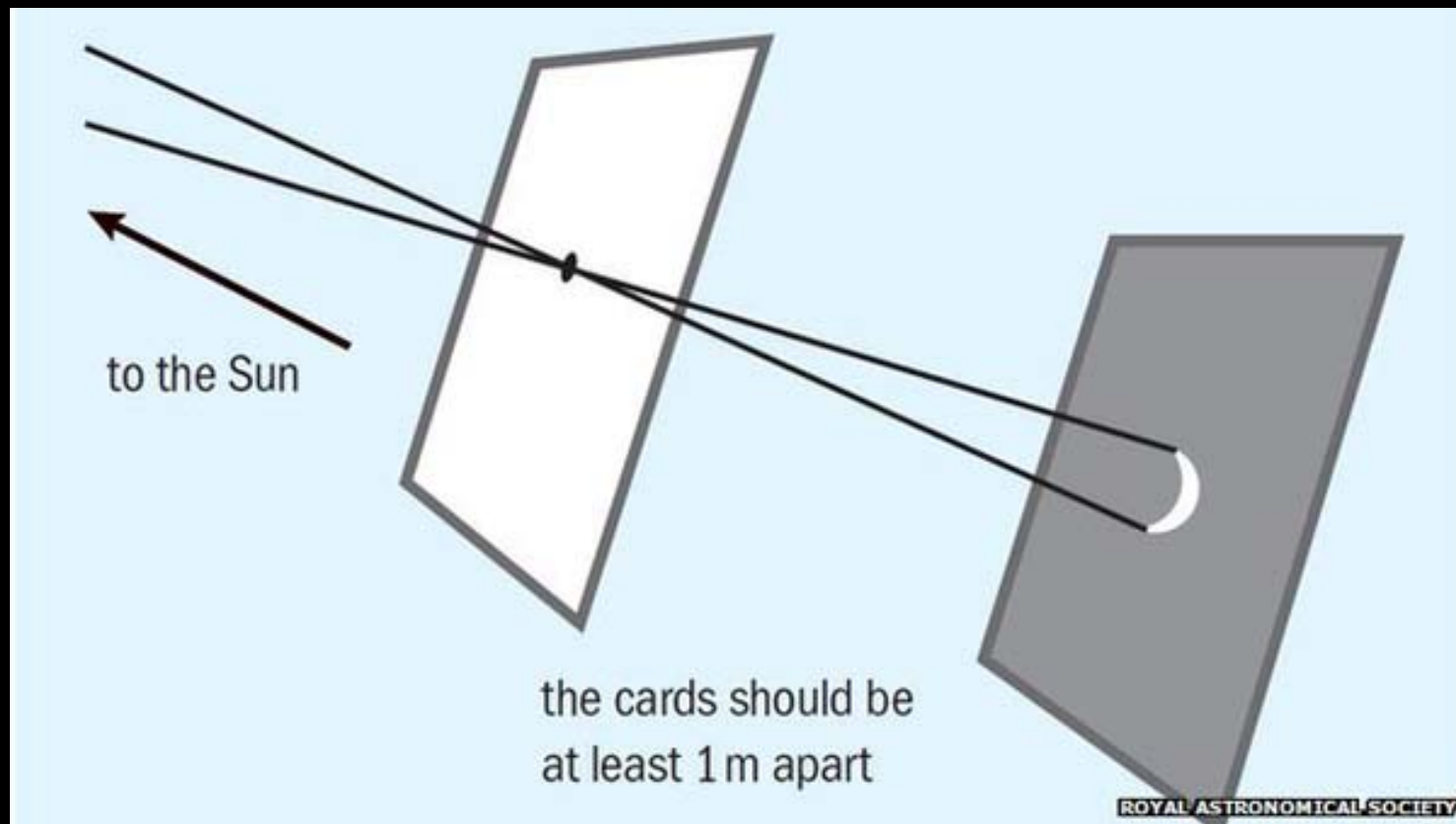
Güneş Tutulması, 29 Mart 2006, Çolaklı/Side, Türkiye



Think of it  
as 10% of  
the Sun  
still there !

Don't think of this  
as 90% eclipse

# Make a “pinhole camera”



# Leaves making “pinhole cameras”



If there are mountains in the distance...



# Baily's beads

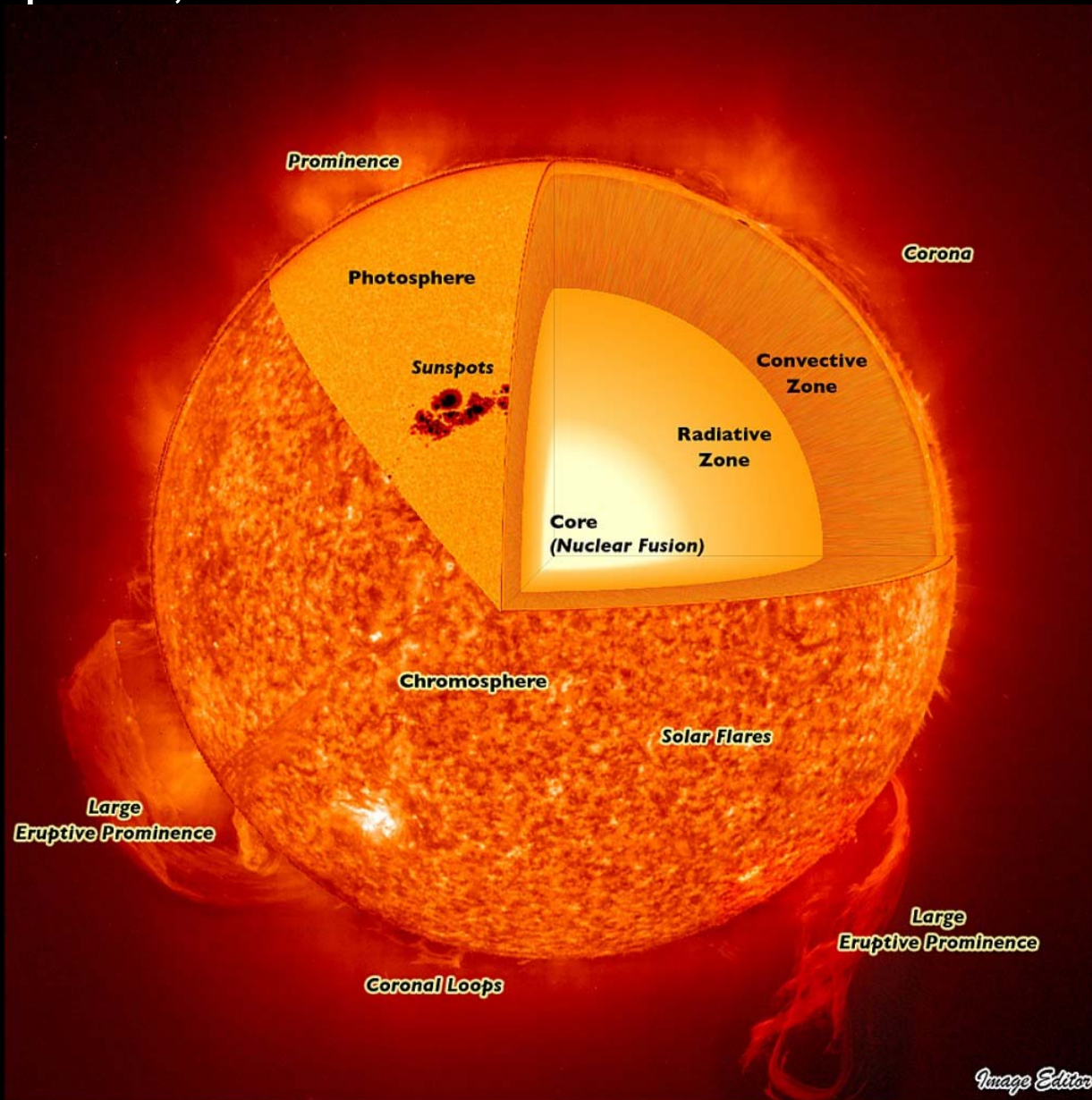


# Prominences...

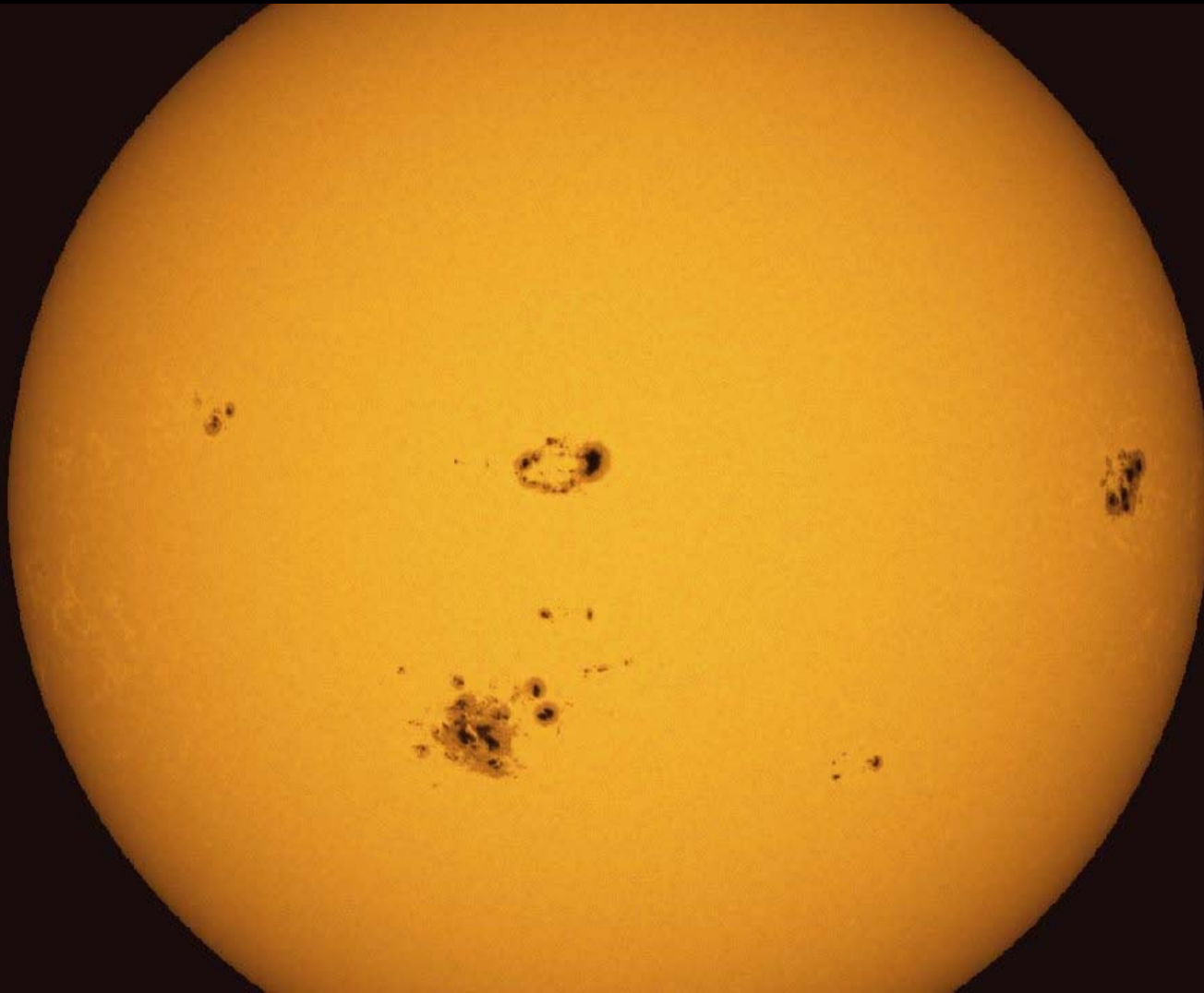




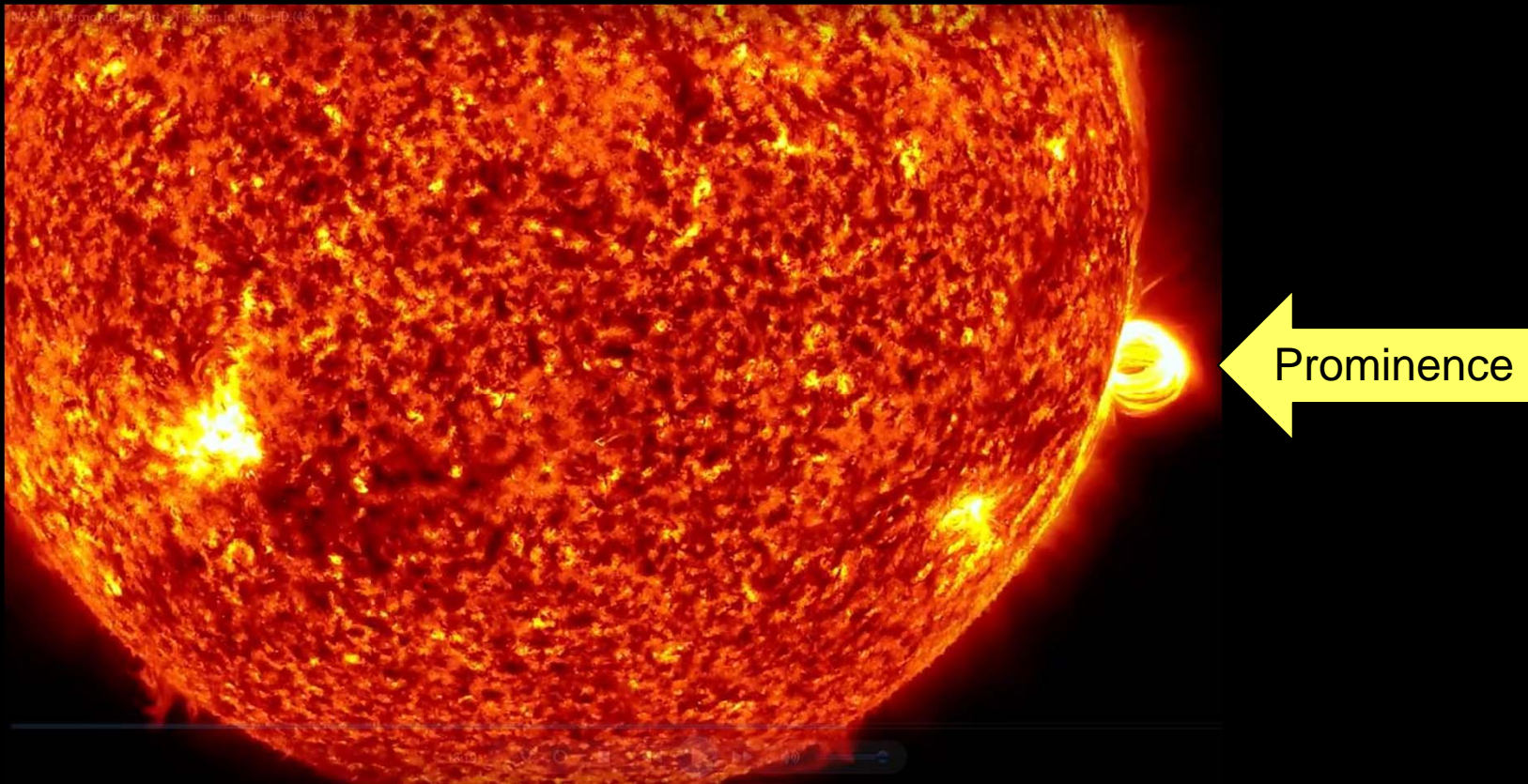
The outer layers of the sun are the photosphere, the chromosphere, and the corona...



Normally, you see the photosphere...



Above the photosphere is the *chromosphere*, which astronomers study using satellites that have ultraviolet sensitive cameras...



And above the chromosphere is the *corona*, that can be seen by X-ray sensitive cameras...



Watch what animals do! Birds. Cows. Buffalo?!

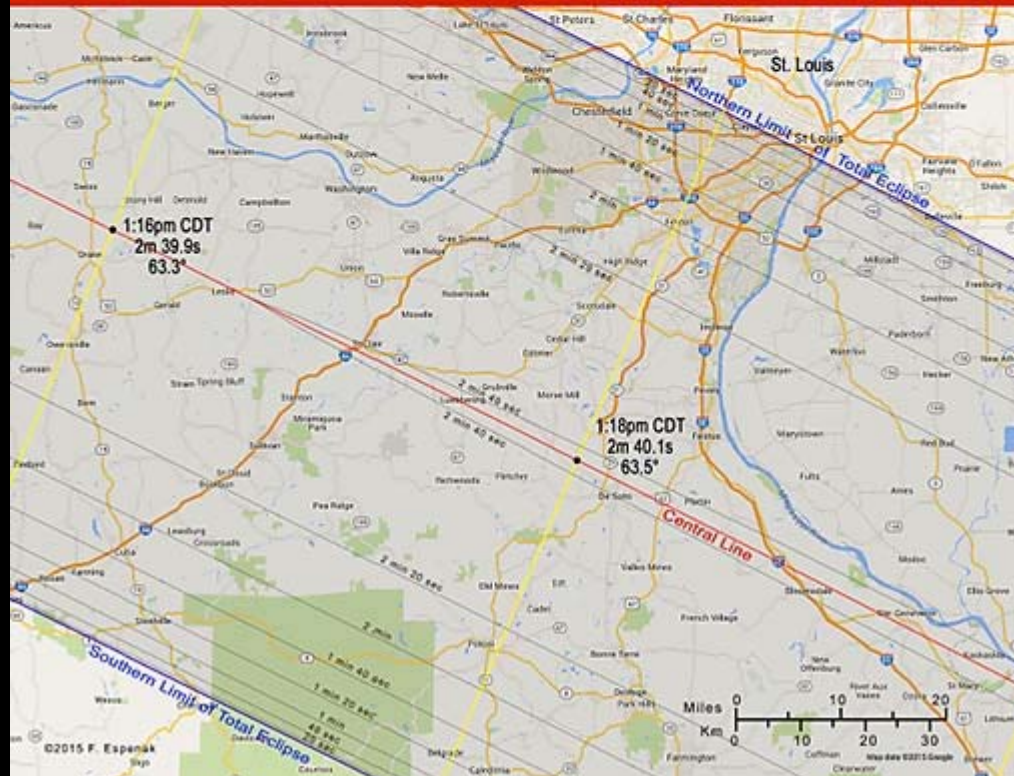
[..\eclipsevideo+still\Animals at Total Eclipse.mp4](#)

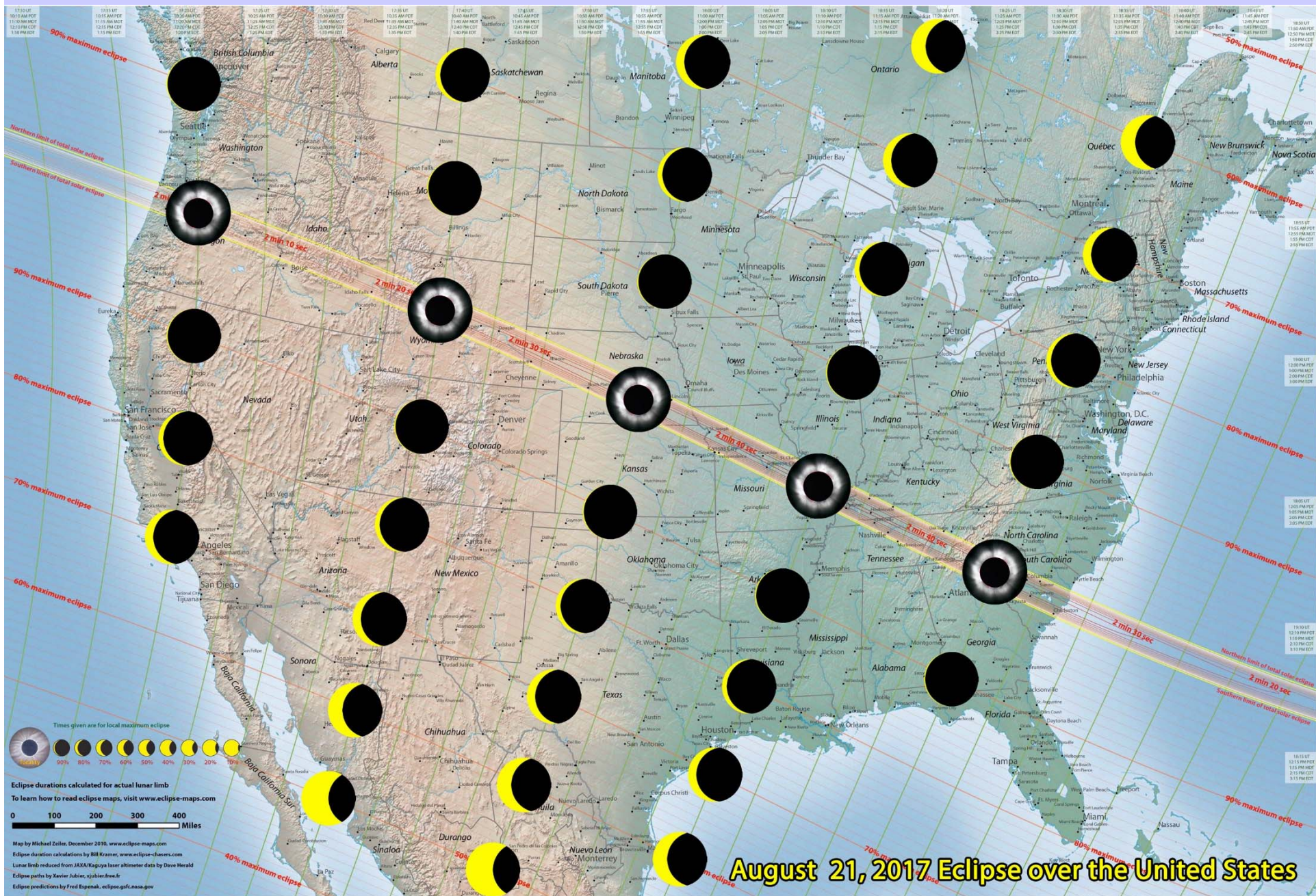


The *unedited* video  
30s in

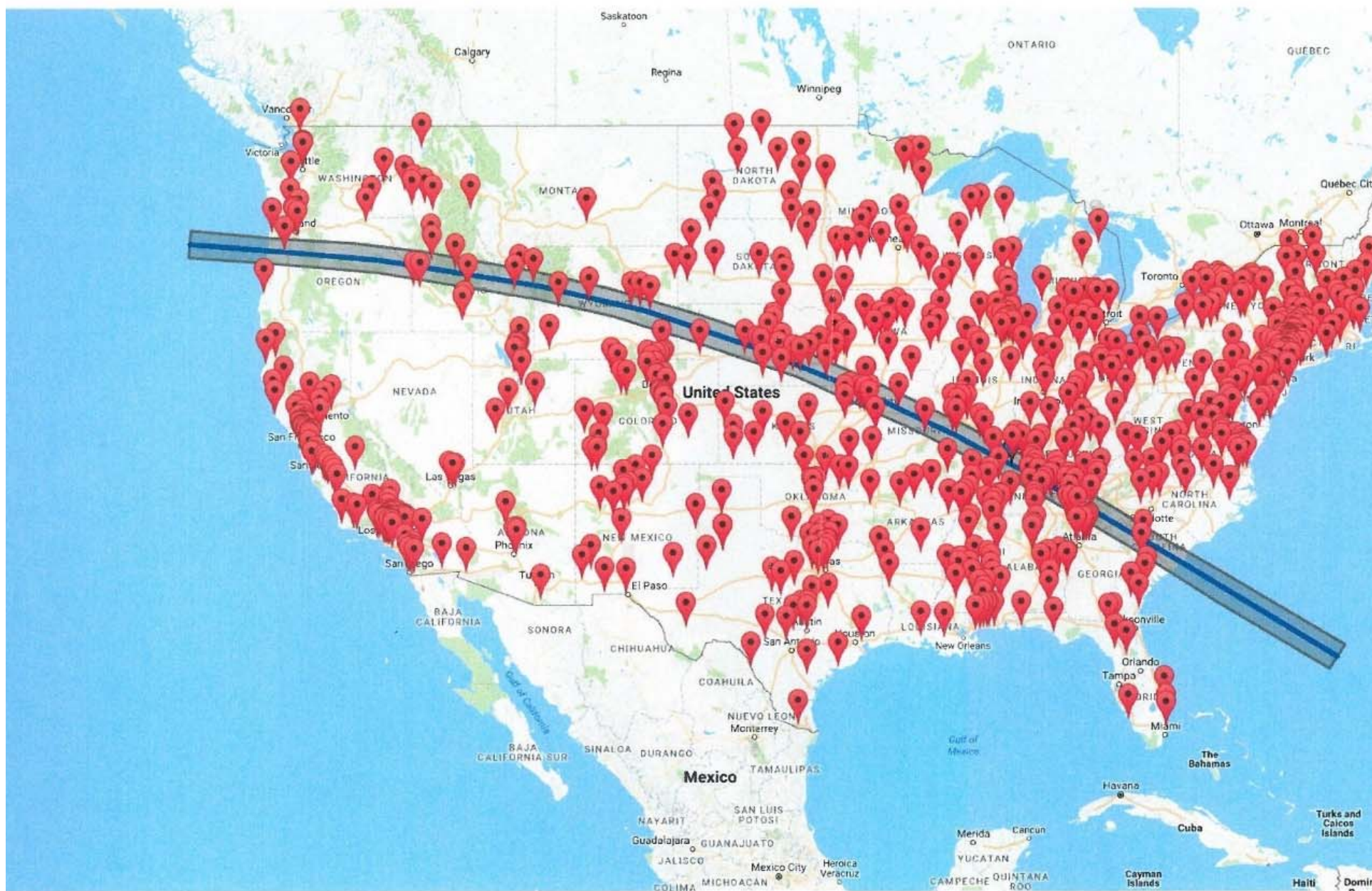


# Road Atlas for the Total Solar Eclipse of 2017 Fred Espenak





August 21, 2017 Eclipse over the United States

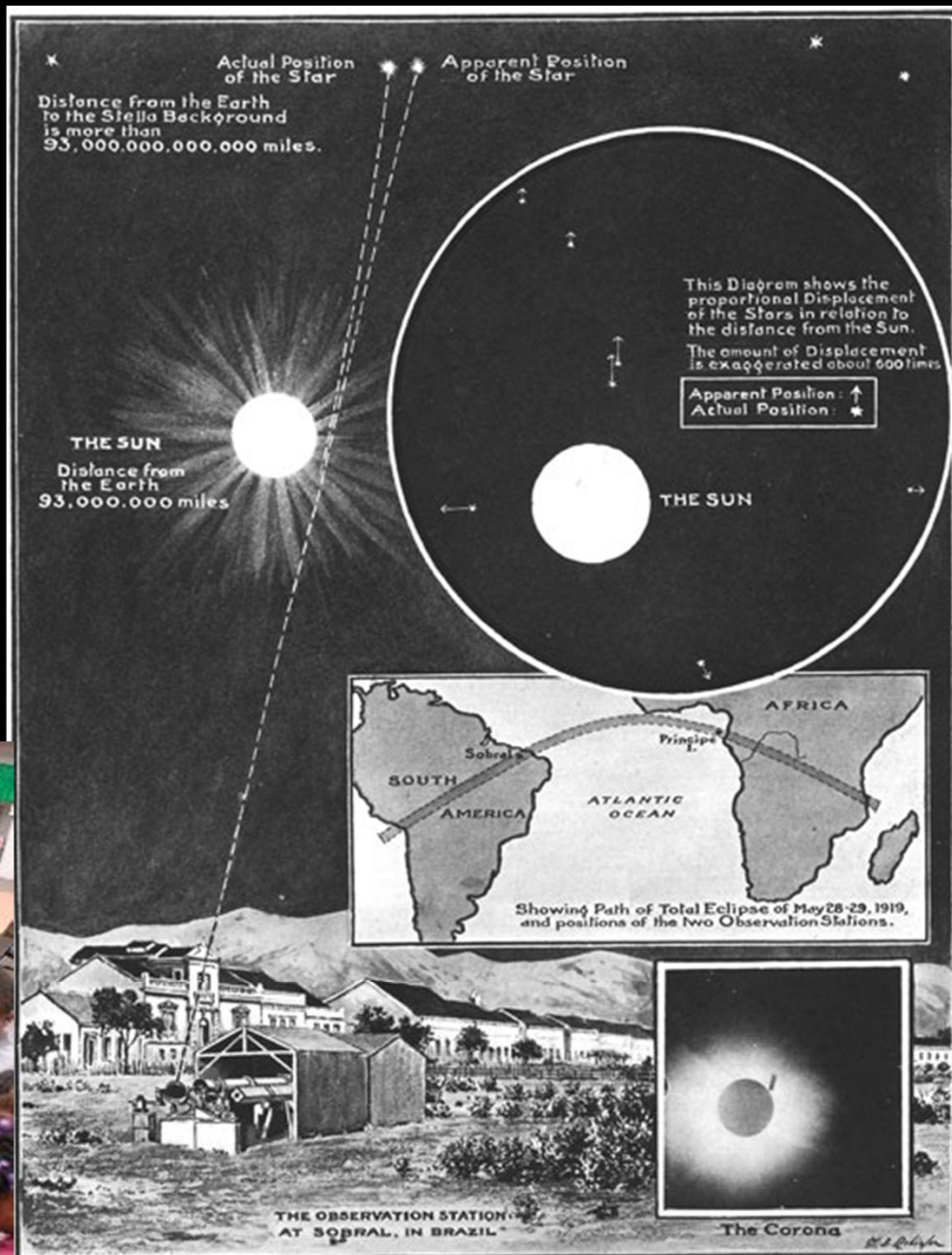
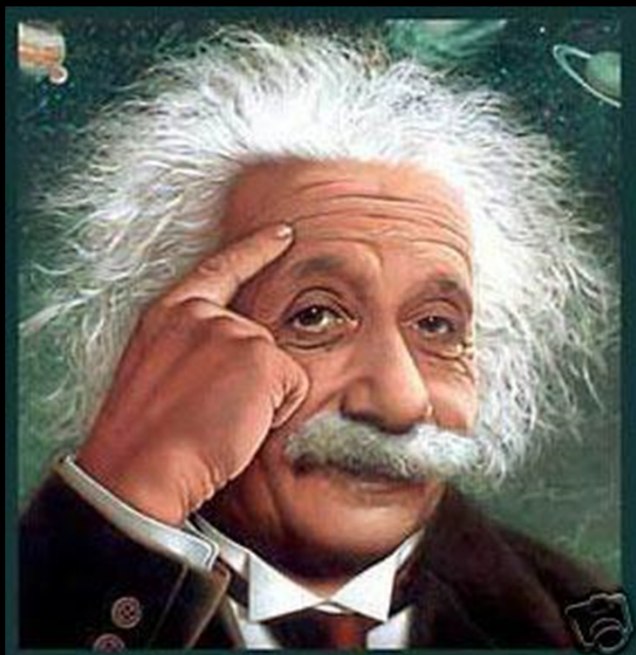




Help people view  
and make \$5,000  
for your school or  
yourself...!

-[McGuckin](#)

# Science at eclipses



# Testing General Relativity

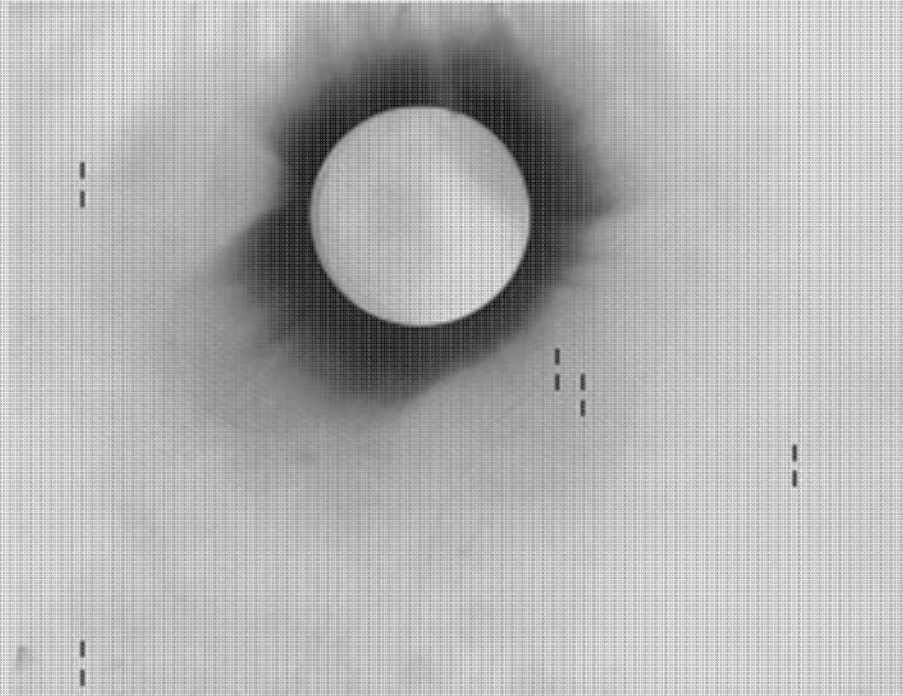
New York Times,  
November 10, 1919

## LIGHTS ALL ASKEW IN THE HEAVENS

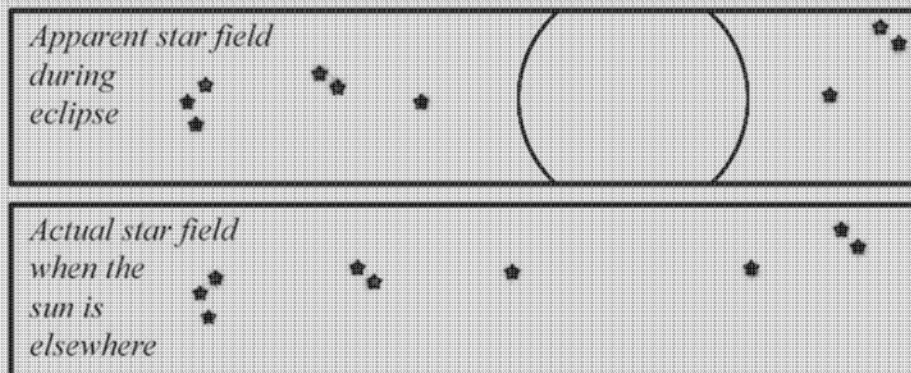
Men of Science More or Less  
Agog Over Results of Eclipse  
Observations.

### EINSTEIN THEORY TRIUMPHS

Stars Not Where They Seemed  
or Were Calculated to be,  
but Nobody Need Worry.



1919 solar eclipse



[www.coursera.org](http://www.coursera.org)

[www.Colorado.edu/eclipse](http://www.Colorado.edu/eclipse)

[www.eclipse-watch.com](http://www.eclipse-watch.com)

[dduncan@Colorado.edu](mailto:dduncan@Colorado.edu)

<http://casa.Colorado.edu/~dduncan>