


Safe Eclipse Viewing

August 2nd, 2017

Host: Brooks Mitchell, STAR_Net Education Coordinator

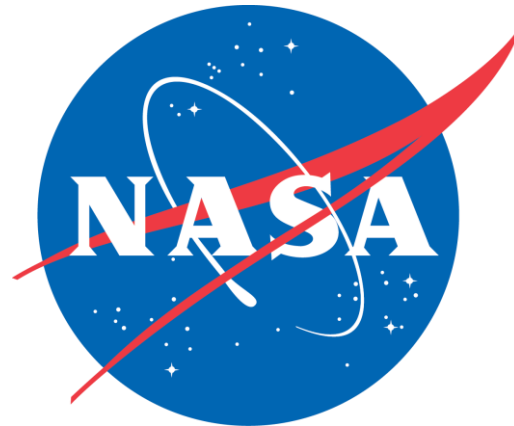
Presenter: Dr. Doug Duncan, Astronomer and Director of the Fiske Planetarium



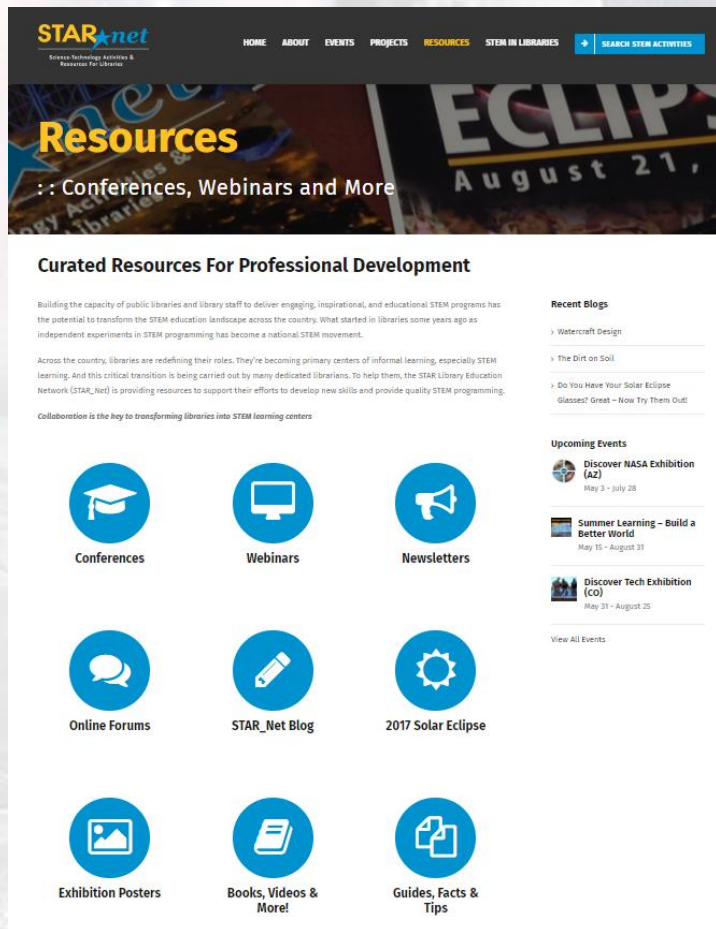
Audio problems? Click and highlight the  button at the top of your screen. You can also click “Meeting” > “Audio Setup Wizard”. You will not need microphone capabilities.



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STARnet
Science-Technology Activities &
Resources For Libraries

HOME ABOUT EVENTS PROJECTS RESOURCES STEM IN LIBRARIES + SEARCH STEM ACTIVITIES

Resources


:: Conferences, Webinars and More

Curated Resources For Professional Development


Building the capacity of public libraries and library staff to deliver engaging, inspirational, and educational STEM programs has the potential to transform the STEM education landscape across the country. What started in libraries some years ago as independent experiments in STEM programming has become a national STEM movement.

Across the country, libraries are redefining their roles. They're becoming primary centers of informal learning, especially STEM learning. And this critical transition is being carried out by many dedicated librarians. To help them, the STAR Library Education Network (STAR_Net) is providing resources to support their efforts to develop new skills and provide quality STEM programming.


Collaboration is the key to transforming libraries into STEM learning centers




Conferences




Webinars




Newsletters




Online Forums




STAR_Net Blog




2017 Solar Eclipse



Exhibition Posters



Books, Videos & More!



Guides, Facts & Tips

Recent Blogs

- Watercraft Design
- The Dirt on Soil
- Do You Have Your Solar Eclipse Glasses? Great - Now Try Them Out!

Upcoming Events

- Discover NASA Exhibition (AZ)
May 3 - July 28
- Summer Learning - Build a Better World
May 15 - August 31
- Discover Tech Exhibition (CO)
May 31 - August 25

[View All Events](#)

Professional development resources, including webinars, newsletters, blogs, forums, videos, and much more!

The STEM Activity Clearinghouse features activities designed specifically for a library setting

Reminders

- Follow us on Social Media!
 - **Facebook.com/STARLibraries**
 - **@STARNet_Project**
- “Out-of-This-World Activities”, **September 13th**
 - Join STAR_Net and the Lunar and Planetary Institute to learn tips and tricks from LPI’s Explore program for engaging children, tweens, and families in space science with games, activities, and events.
 - Registration will open in early August
- Certificate of Attendance via SurveyMonkey Link

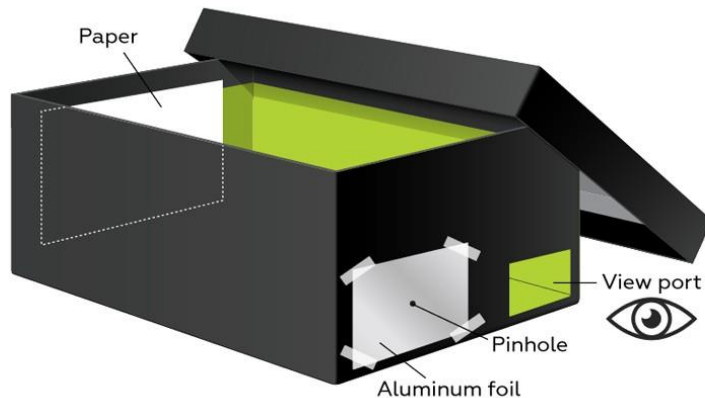
A Note about Eclipse Glasses

- In response to reports of potentially unsafe eclipse viewers flooding the market, American Astronomical Society recently (Aug. 1) updated their advice for safely viewing the solar eclipse:
 - It is no longer sufficient to look for the logo of the [International Organization for Standardization \(ISO\)](#) and a label indicating that the product meets the ISO 12312-2 international safety standard for filters for direct viewing of the Sun's bright face.
 - The only way you can be sure your solar viewer is safe is to verify that it comes from a reputable manufacturer or one of their authorized dealers.
 - AAS Solar Eclipse Task Force has compiled a list of vendors at eclipse.aas.org/resources/solar-filters (link in chat)

Pinhole Projectors



Pinhole Projectors



Easy to make

Common materials = low cost

Safe way to view an Eclipse

Great pre-Eclipse activity

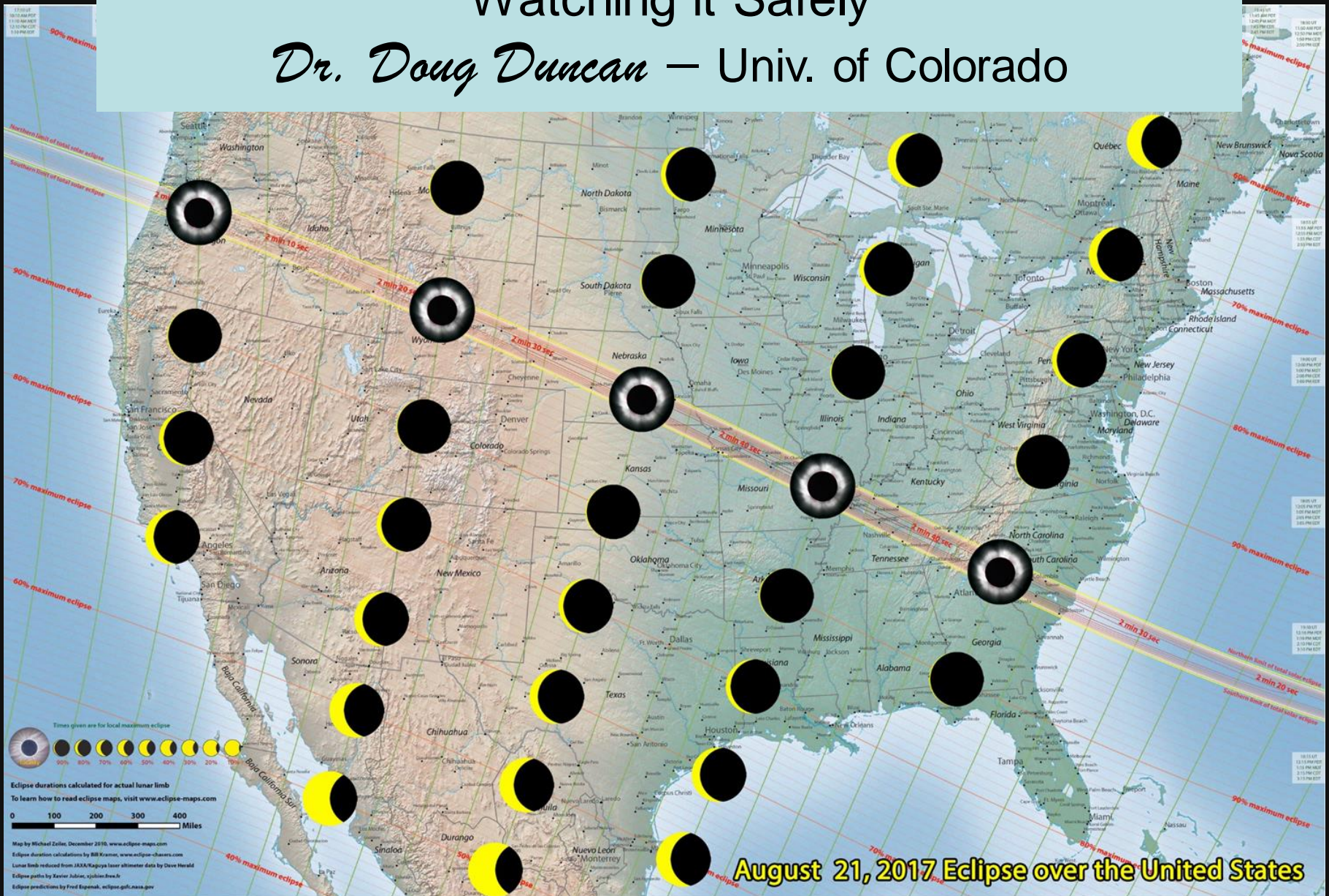
Dr. Doug Duncan



- Astronomer at the University of Colorado, where he directs Fiske Planetarium, the most advanced planetarium in the US
- Part of the project that first found sunspot cycles on other stars
- Part of the Hubble Space Telescope Staff
- Currently serves on the NASA Advisory Committee Science Committee
- Recipient of the 2011 Richard Emmons award presented to the “Outstanding University Astronomy Teacher in the US”

The Great American Total Eclipse Watching it Safely

Dr. Doug Duncan — Univ. of Colorado





March 7, 1970 Eclipse Expedition
w/ Craig Halverson, Art Johnson

I've been chasing
eclipses for a long
time, and I'm still
excited!



Plan for today:

Why is this event so rare?

What will it look like?

How to watch safely— how to help others.

If time – science at eclipses / chasing them

It has been nearly 40 years
since a TOTAL eclipse came
to the continental US... why
so rare?



The moon is 120
moon diameters
from Earth!

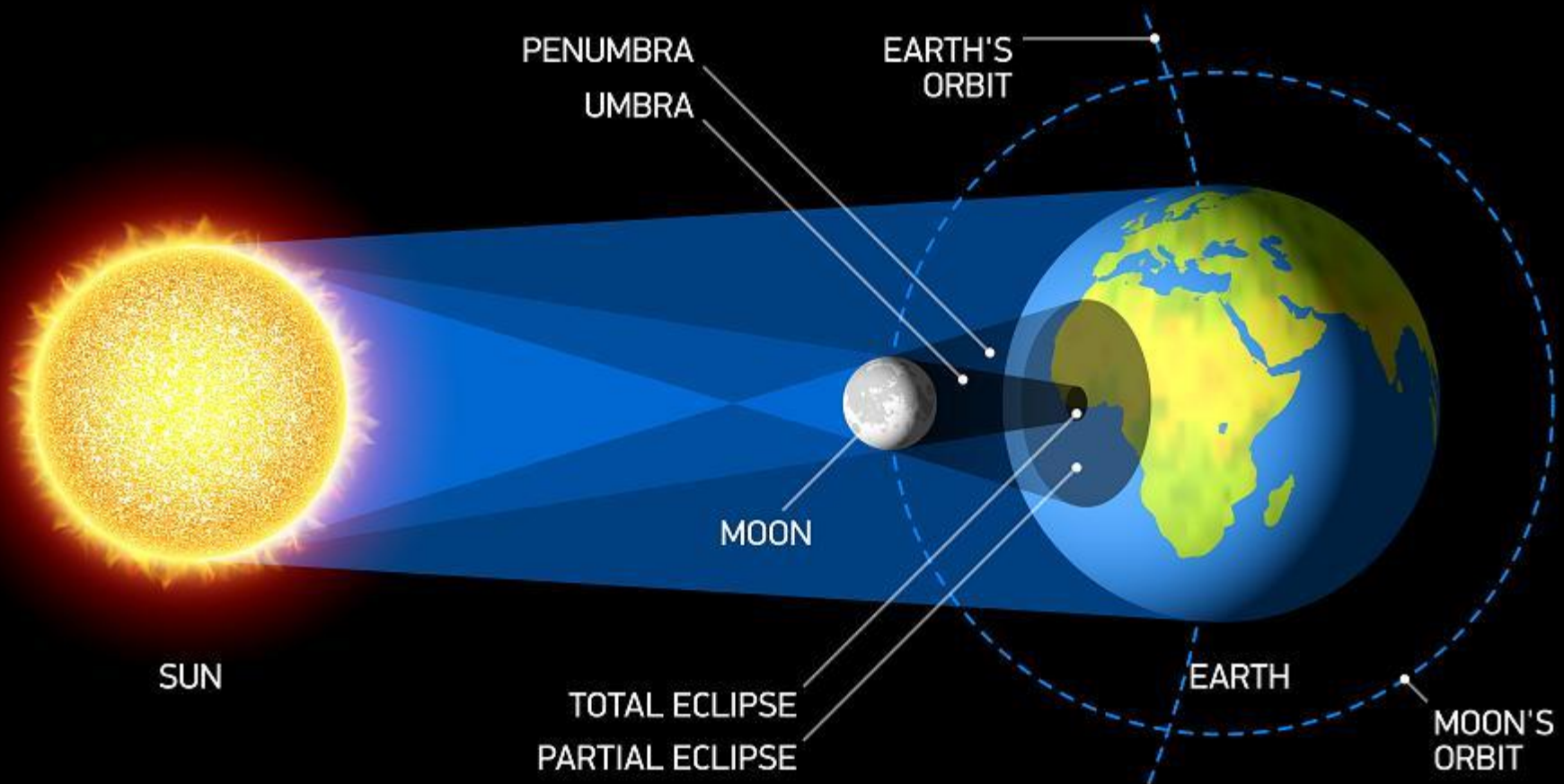
(this is to scale)

It has been nearly 40 years since a TOTAL eclipse came to the continental US... why so rare?

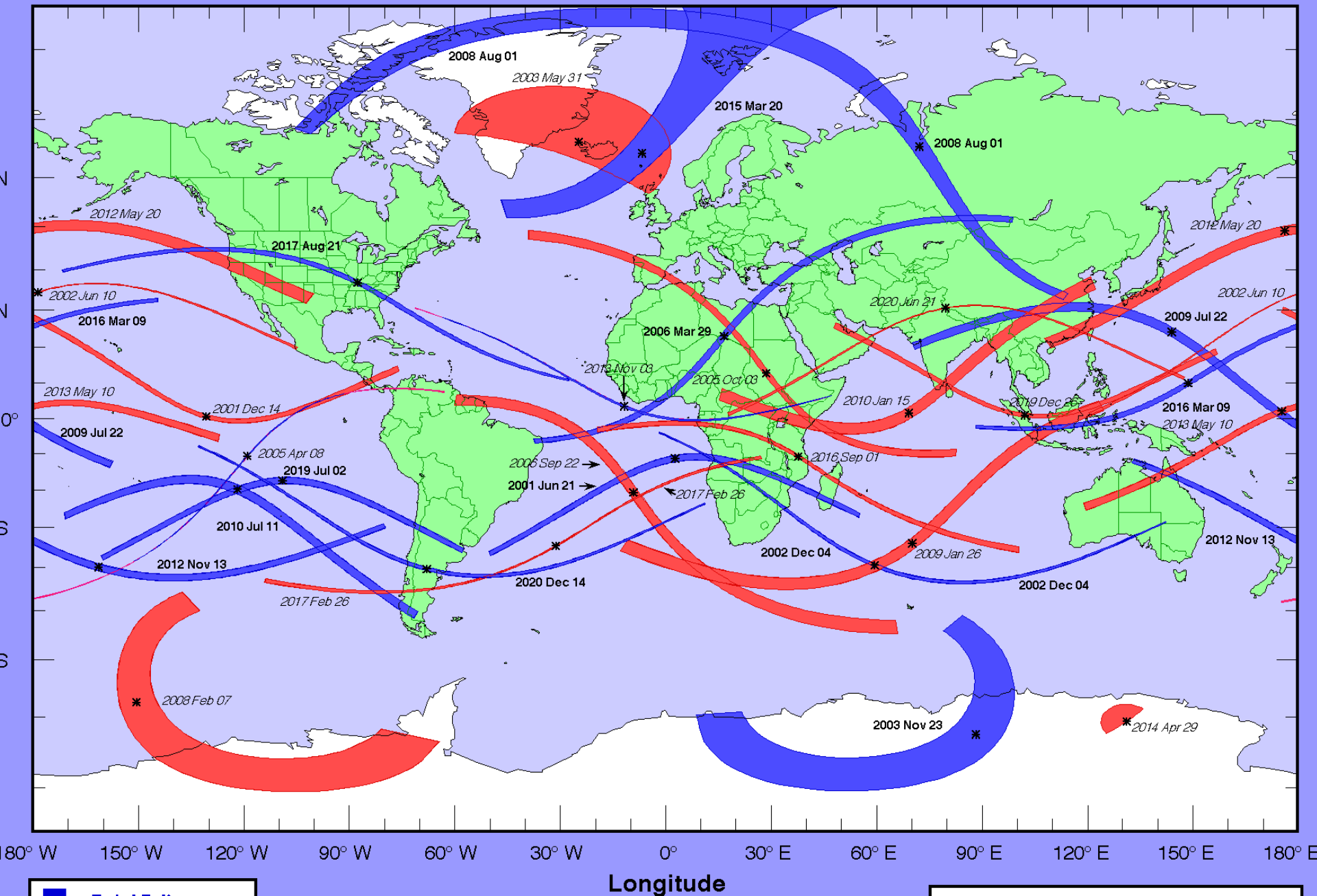


It's shadow must hit the earth to make an eclipse

(not to scale)



Total and Annular Solar Eclipse Paths: 2001 – 2020



Plan for today:

Why is this event so rare?

What will it look like?

How to watch safely— how to help others.

At partial eclipse locations, **slowly**,
over more than 2 hours...



Eugène Atget (1857–1927 Paris): L'Eclipse (1911)





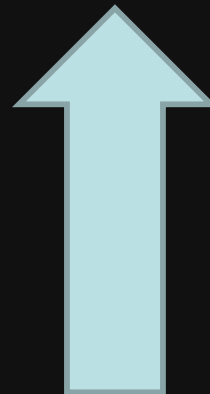
At even a 90% eclipse it will NOT get dark!



March 2015

T. Robitaille, Heidelberg, Germany

Still very light out!



1



2



3



4



5



1



2



4



8



16



Energy



It is a 5% sun-visible eclipse!

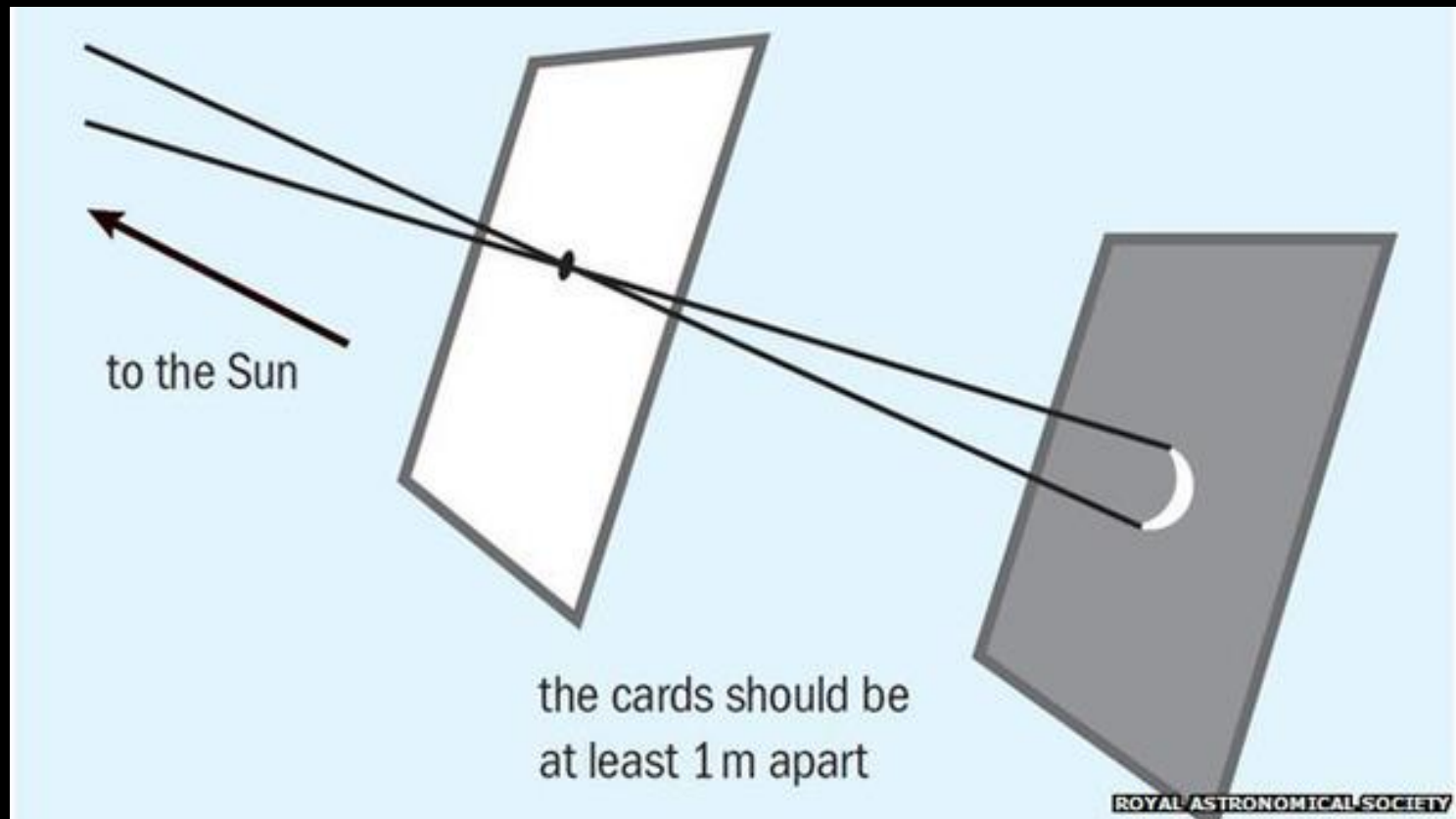
Today's important message: Do NOT think of this as a 95% eclipse!

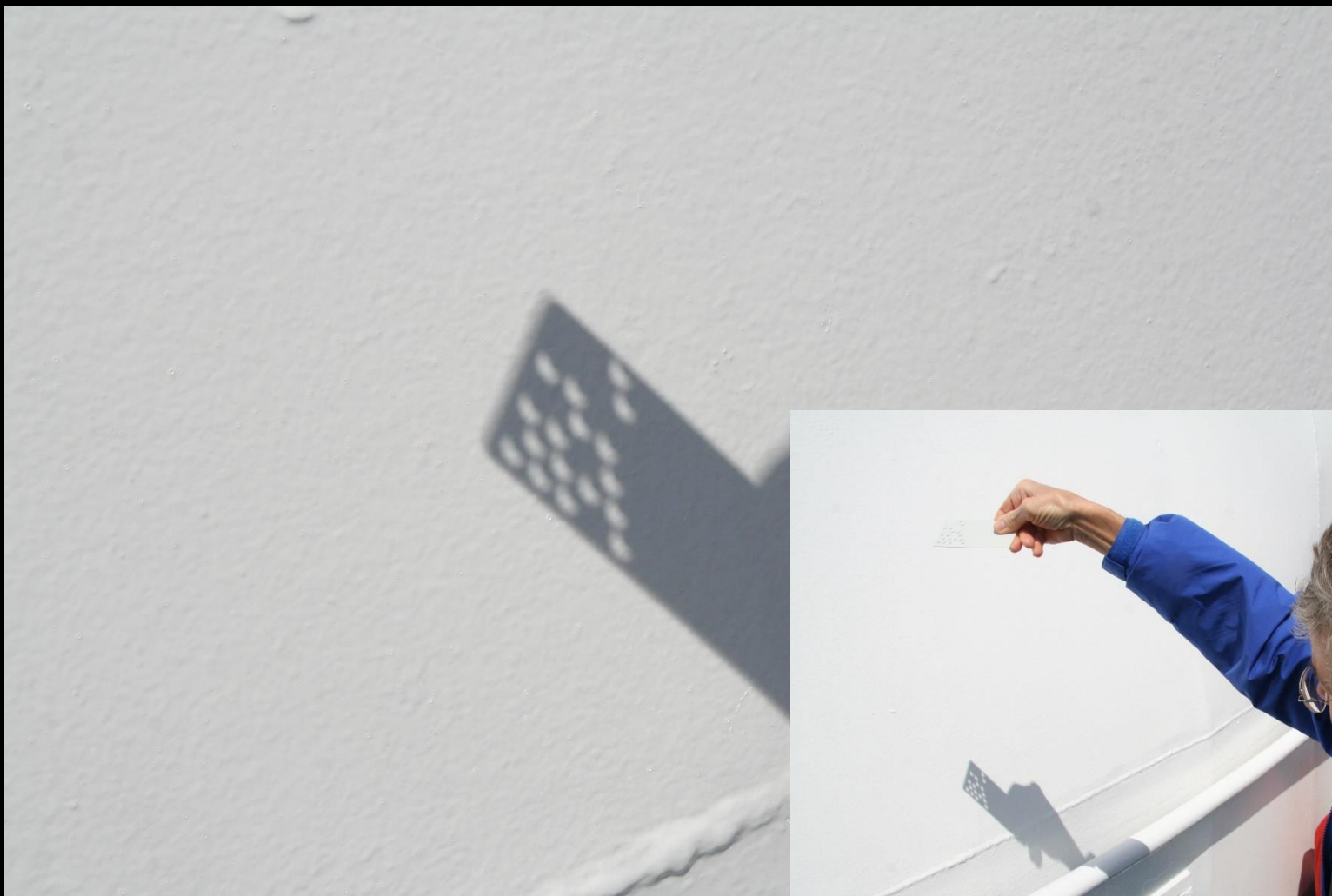
The sun is 400,000 times brighter than the full moon.

5 % of the sun is 20,000 times brighter than the full moon.

August 21, 2017 Eclipse over the United States

Make a “pinhole camera”

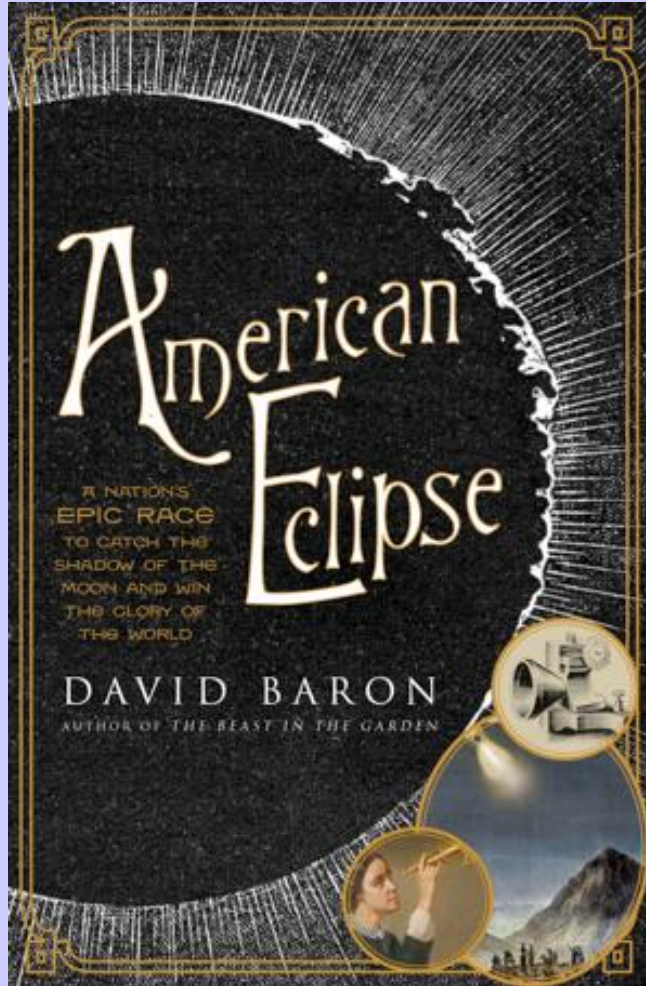




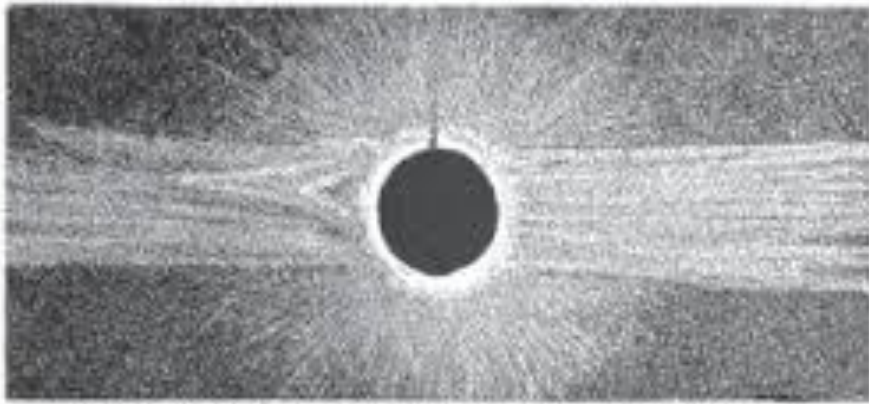
Leaves making “pinhole cameras”



David Baron, “I thought I knew what to expect”[I was so wrong!]



Get this book



THE CORONAL STREAMERS OF 1878 (LANGLEY)

Maria Mitchell organizes her own expedition...



Maria Mitchell Association

27 year old Thomas Edison observes the IR...

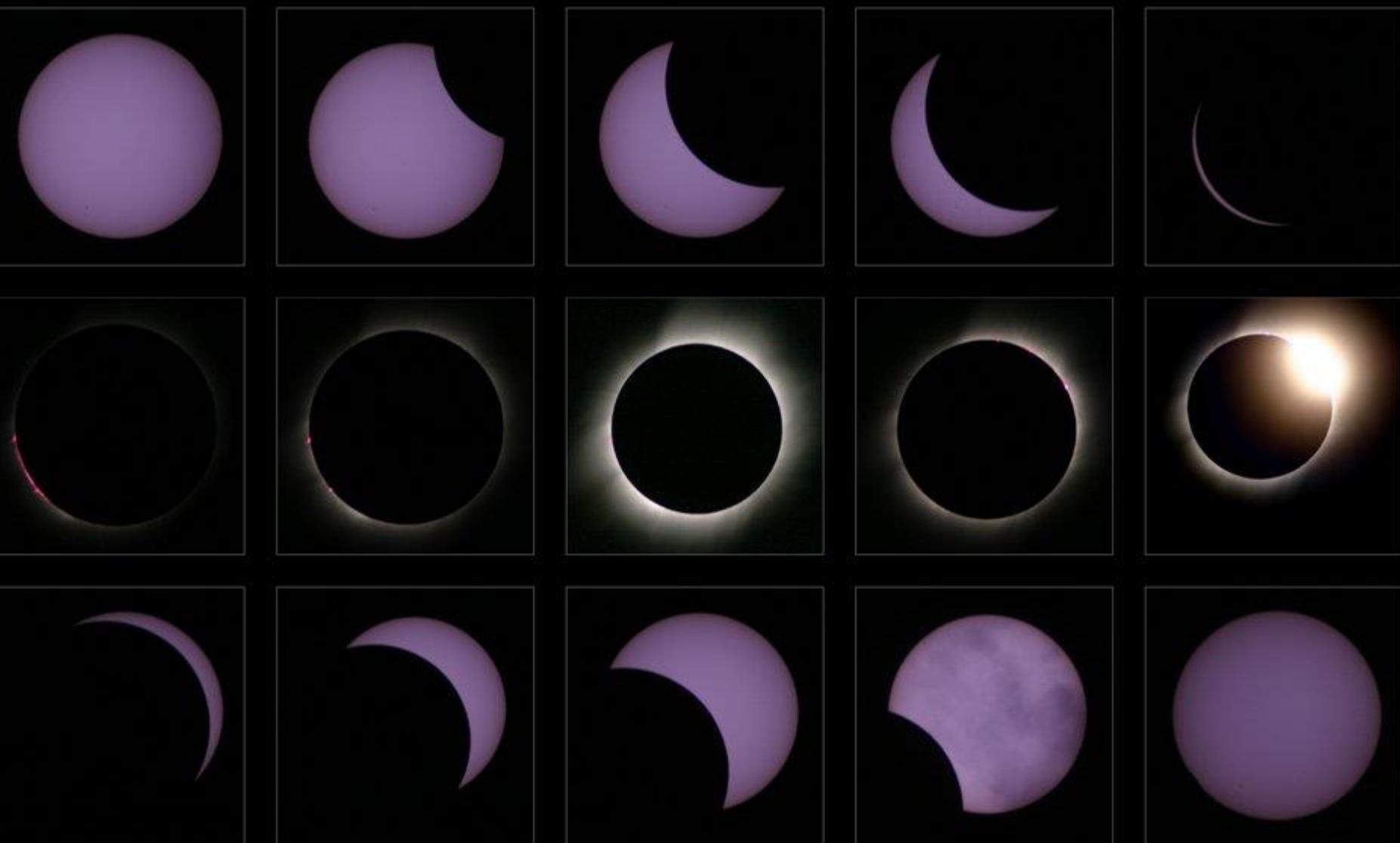


Maria Mitchell Association

Is this the Grand Canyon?



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



If there are mountains in the distance...



Shadow bands...



Baily's beads



Prominences...





Totality Tips!

Record a “countdown”

- Start it when totality starts

Use a pair of binoculars for perhaps
half of totality.

Note the “circular sunrise,” Venus,
bright stars...



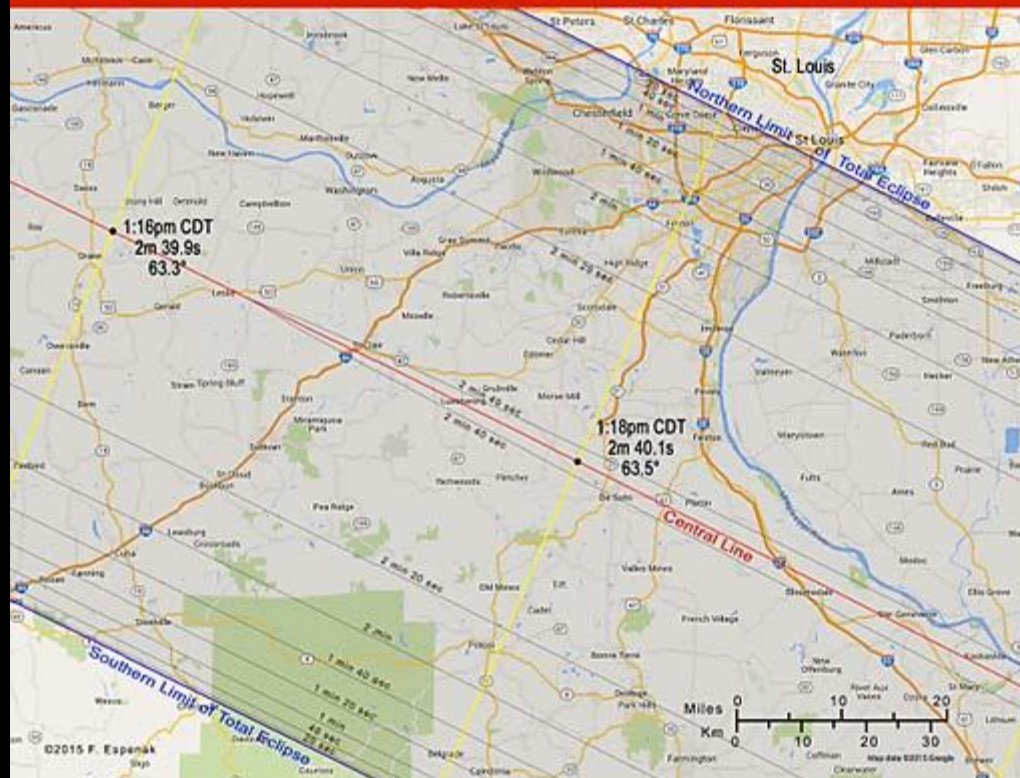
The *unedited* video



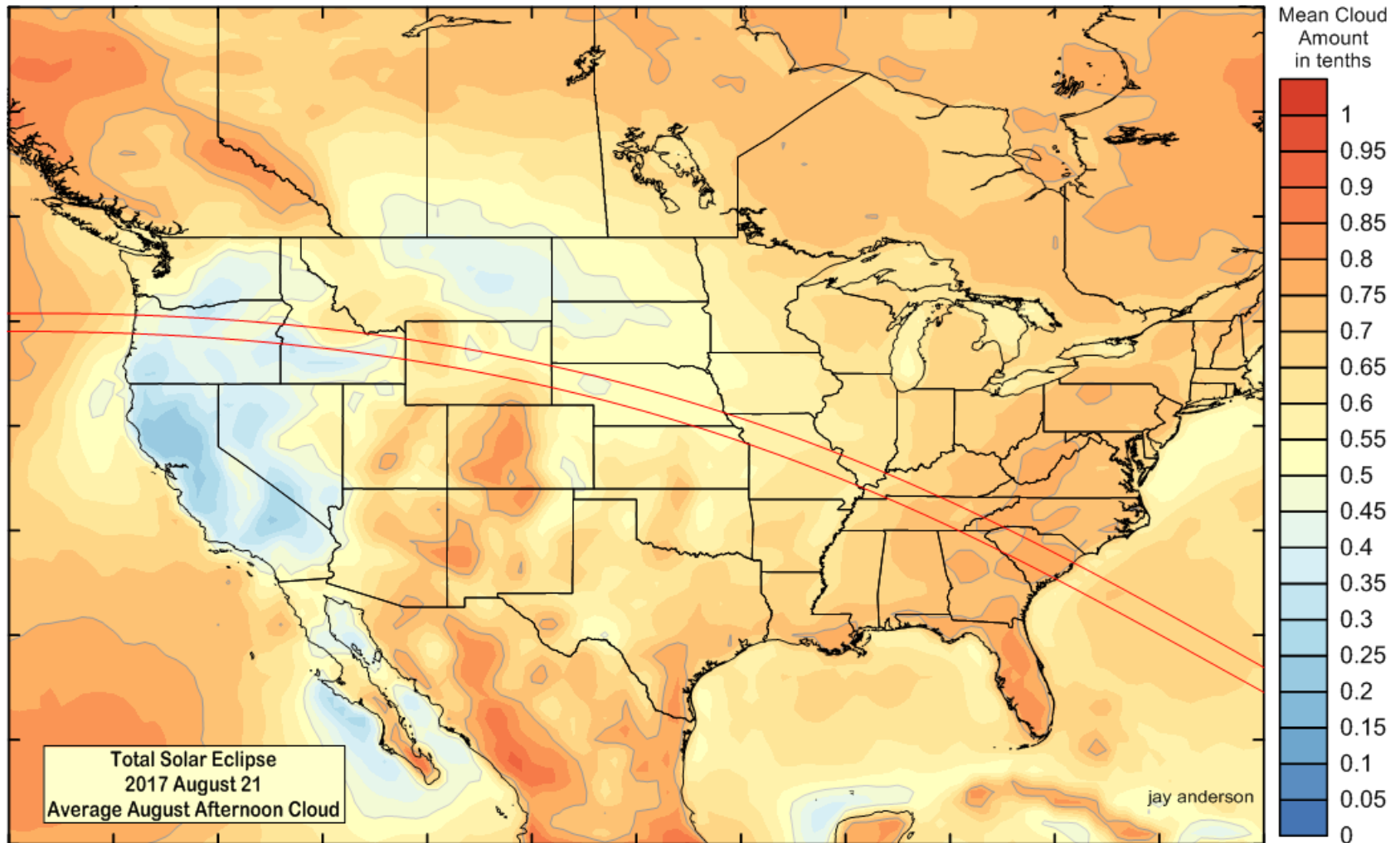
Animals do strange things...



Road Atlas for the Total Solar Eclipse of 2017 Fred Espenak



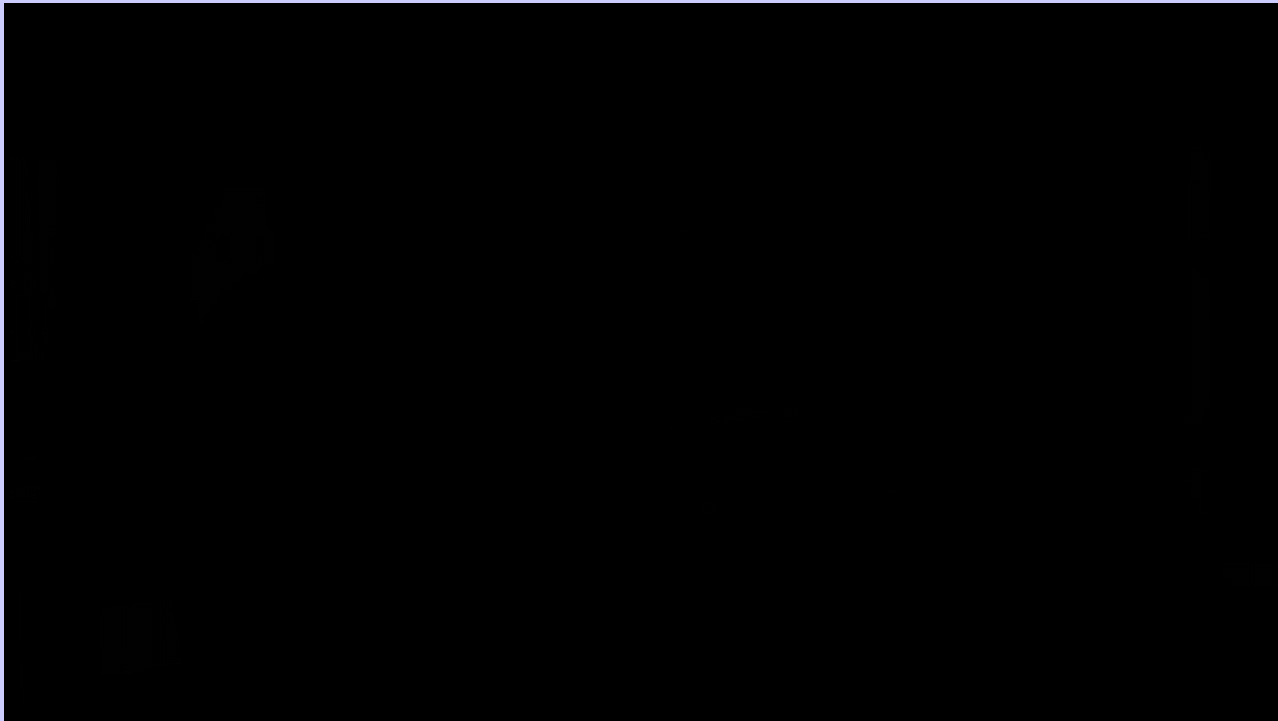
Jay Anderson 2017 eclipse



Extra glasses. Fundraiser?

McGuckin (55 s in)

To show a group the partial phases,
use binocular projection, if you won't
get distracted (helper?)



www.colorado.edu/eclipse

www.coursera.org/learn/eclipse

www.starnetlibraries.org/2017eclipse

www.daystarfilters.com

Reminders

- You will be redirected to a SurveyMonkey link after the webinar ends. Complete the survey and you will be given the link for a Certificate of Attendance
- September 13th – “Out of This World Activities”
 - Registration opens early August
- All webinars are recorded and archived on <http://www.starnetlibraries.org/resources/webinars/>
- Join **starnetlibraries.org** and like us on Facebook and Twitter!
 - **Facebook.com/STARLibraries**
 - **Twitter: @STARNET_Project**

Thank You!