New Hampshire

TOTAL SOLAR ECLIPSE

APRIL 8, 2024

New Hampshire
TOTAL SOLAR ECLIPSE
APRIL 8, 2024

Moderator:

Pam Sullivan
President, Sullivan Creative
Executive Director, Women's Rural Entrepreneurial Network

Panelists:

Douglas Arion, PhD
Executive Director, Mountains of Stars
Professor Emeritus, Carthage College

Rick Fienberg, PhD
Senior Contributing Editor, *Sky & Telescope*
Project Manager, Solar Eclipse Task Force, American Astronomical Society

Amy Bassett
Deputy Director, Division of Travel & Tourism Development
Dept. of Business & Economic Affairs, State of New Hampshire

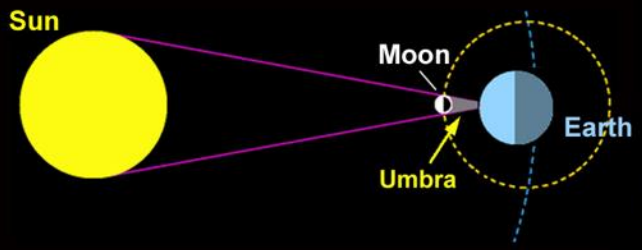
When the Sun Disappears in the Daytime: A Grand Opportunity for NH

Dr. Douglas Arion
Executive Director *Mountains of Stars*
Professor Emeritus *Carthage College*

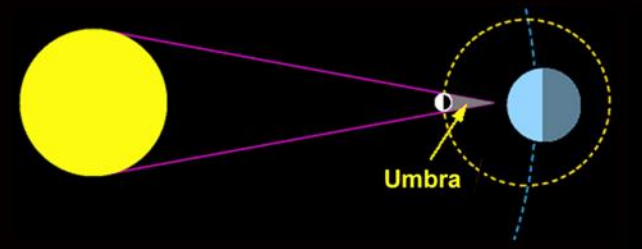
Mountains of Stars


Astrotourism
Star gazers, eclipse chasers, and the dark sky movement
Marlin

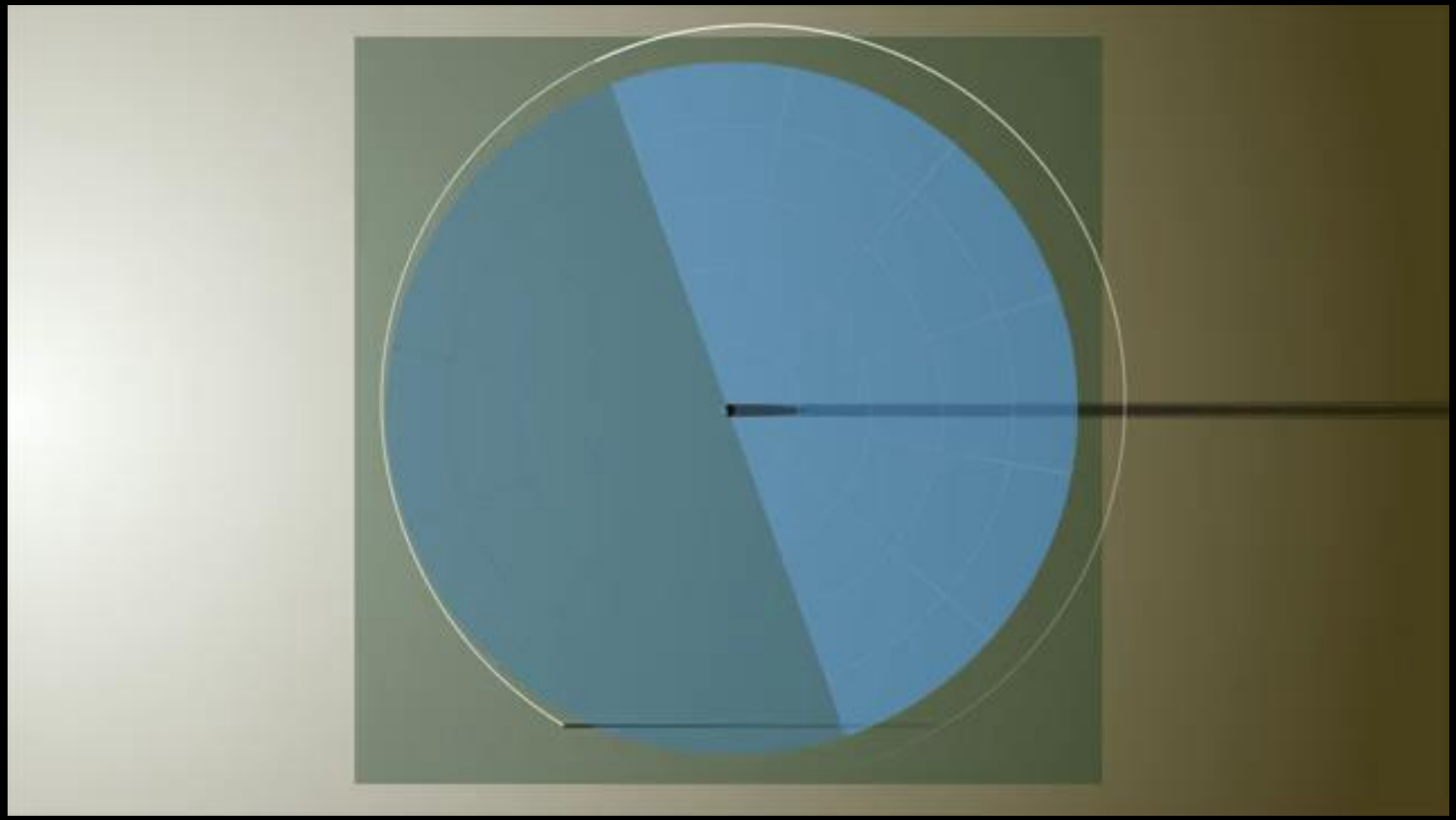
Total Solar Eclipse!



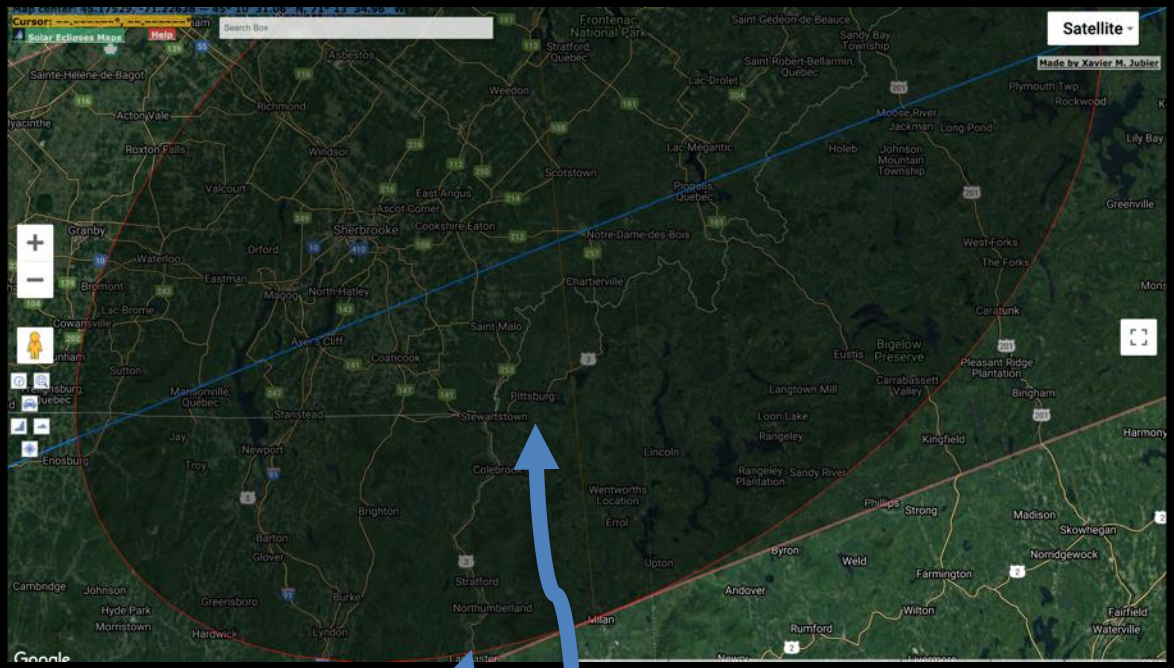
Total eclipse



Annular eclipse

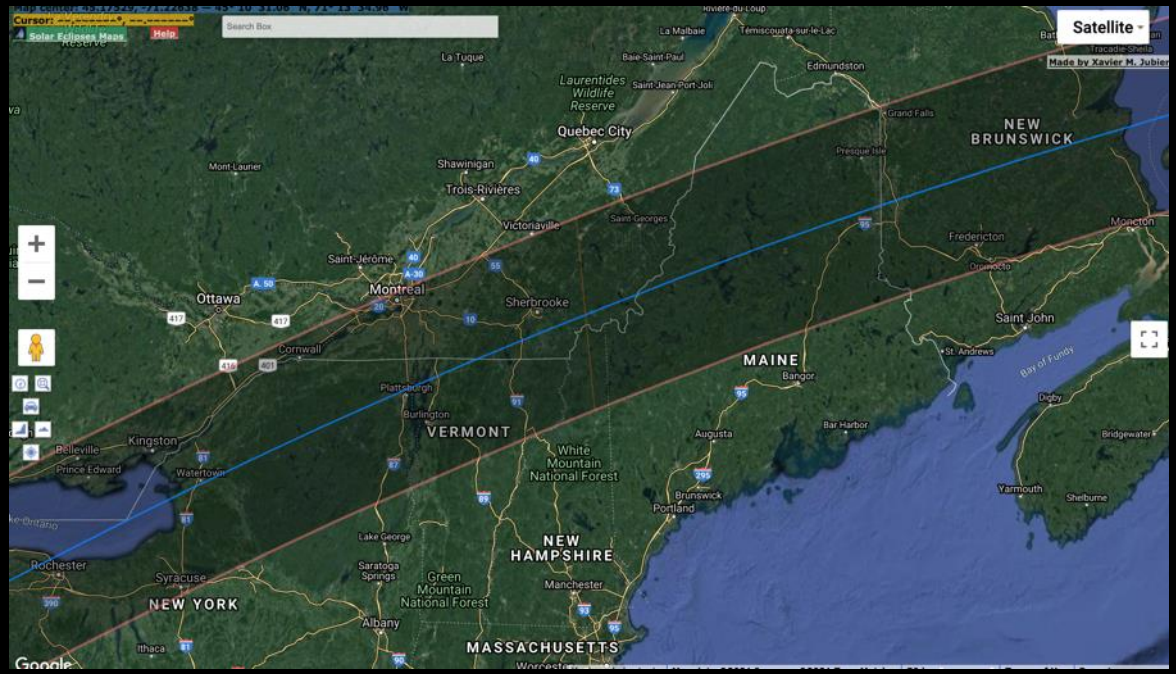


Two Upcoming Solar Eclipses: 2023 and 2024



Duration: 46 sec

Duration: 3 min 15 sec



Maps by Xavier Jubier

A Rare Opportunity:
Total Solar Eclipses in the United States

------1979 ------- 2017 -------2024 ------ 2045 ------

The wait in any One Location:
300-400 Years!

Opportunities/Challenges

- Lodging, Restaurants, Vendors
  - Tourist influx during ‘mud season’
  - Sales of goods/memorabilia
- Issues:
  - Traffic (Especially after!)
  - Emergency services
  - Opening businesses
  - Marketing/Promotion
  - Getting ahead of the ‘power curve’


NEW HAMPSHIRE'S 48
4000 FOOTERS
I MISS


I BLACKED OUT
8.21.2017 IN
STANLEY
IDAHO
IDAHO, USA
Total Eclipse
of the Sun
August 21, 2017


Glasses, Maps, Atlases and More
MY SCIENCE SHOP
Magazines Globes & Maps Books & DVDs STEM Toys Gifts Posters Sale
LIMITED QUANTITIES!
PREPARE FOR
THE NEXT ECLIPSE!
Prepare for upcoming solar eclipses with our selection of products curated by the editors of Astronomy and Discover magazines. Shop for eclipse glasses, maps, atlases and more!
SHOP ALL

Processes in Place Now

- NH Eclipse Day Declaration
- Joint Agreement Coos County NH/Coos, OR
- Hosting AAS Eclipse Workshop – Fall 2023
  - AMC Highland Center
  - 150+ people from US, Canada, Mexico planning for eclipse
- New Hampshire Coordination Group Preparing for Eclipse
  - NH Grand/WREN
  - CEDC
  - NH Travel and Tourism
  - American Astronomical Society

Facebook: *mountainsofstars*

www.mountainsofstars.org

Douglas Arion

darion@carthage.edu
director@mountainsofstars.org

Solar Eclipse Resources from the American Astronomical Society

Rick Fienberg

AMERICAN ASTRONOMICAL SOCIETY

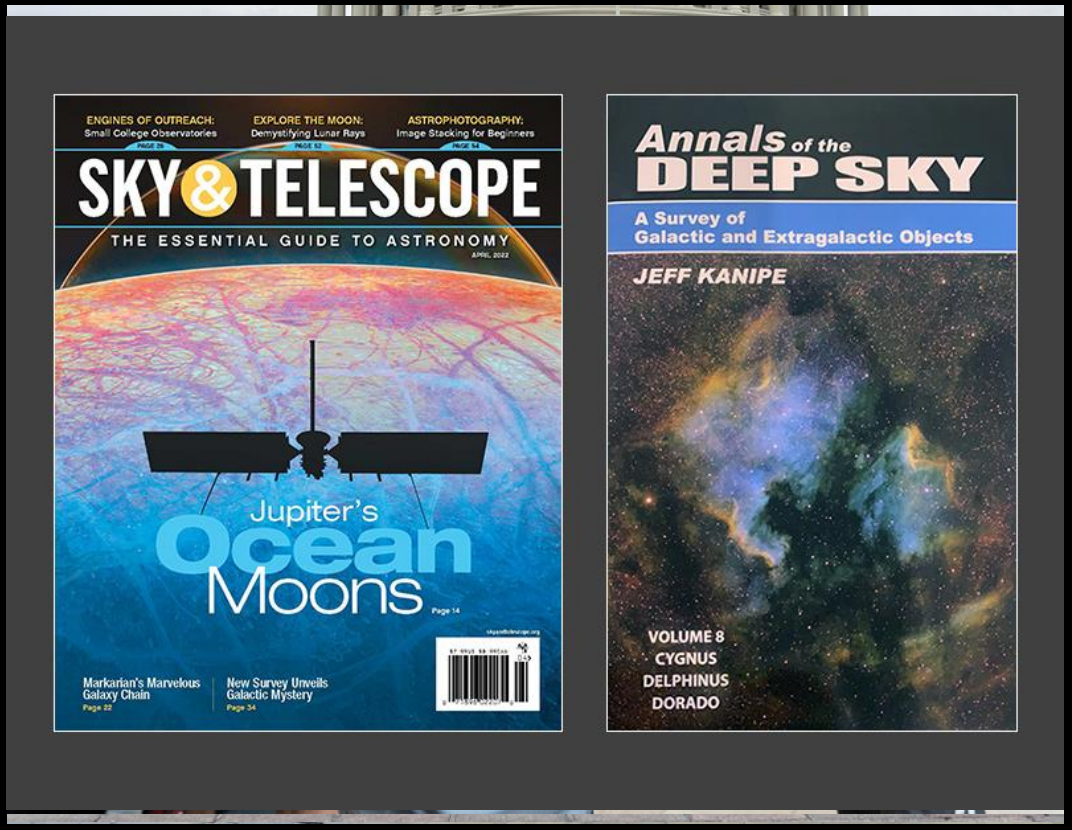
SKY & TELESCOPE
THE ESSENTIAL GUIDE TO ASTRONOMY

AMERICAN ASTRONOMICAL SOCIETY

The mission of the AAS is to enhance and share humanity's scientific understanding of the universe as a diverse and inclusive astronomical community.

Major activities:

- Meetings
- Public Policy
- Media Relations
- Awards & Prizes
- Educ. & Outreach
- Prof. Development
- Publishing



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AAS Solar Eclipse Task Force

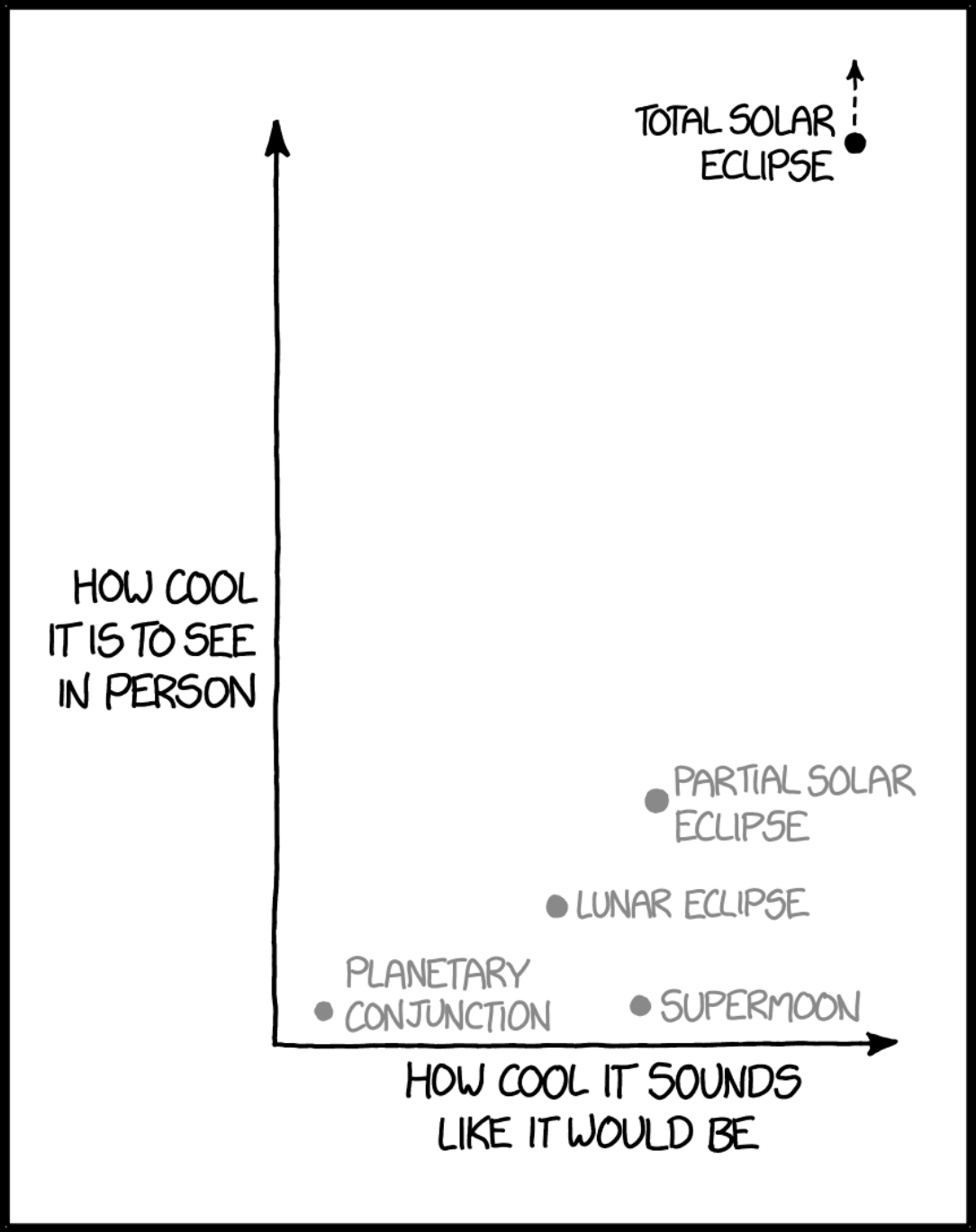
Purpose: To function as a think tank, coordinating body, and communication gateway/hub.

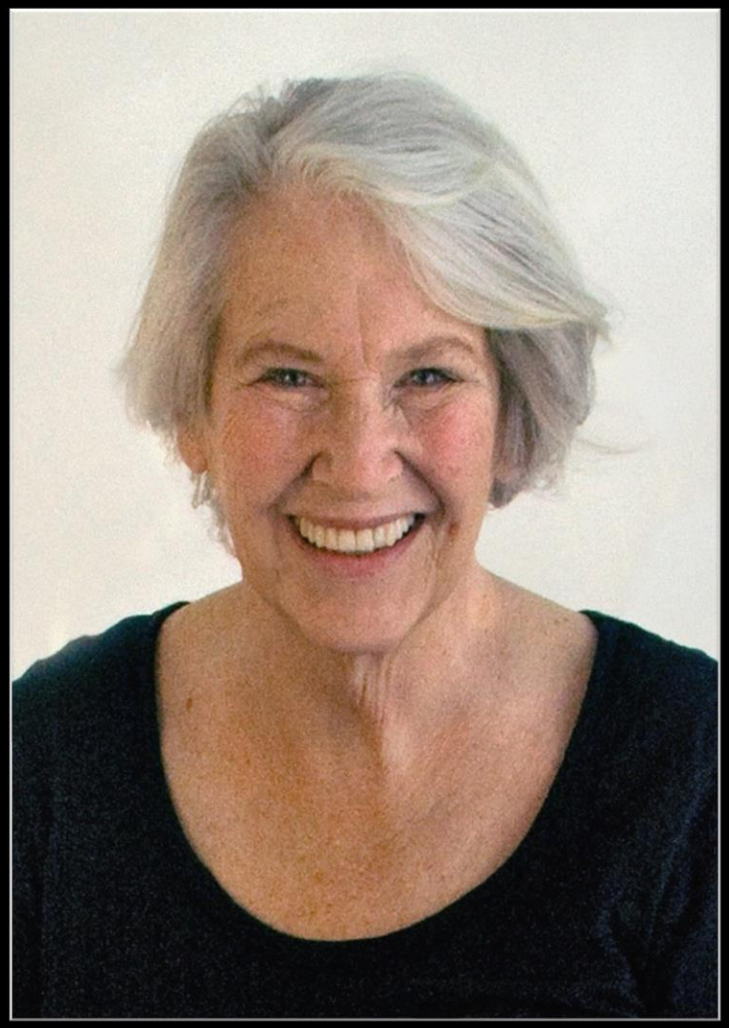
Principal activities:

- Website: eclipse.aas.org
- Working groups
- Planning workshops
- Encourage people to get into path of totality
- Promote eye safety

Americans and the 2017 Eclipse, Jon Miller (U. Michigan):

- 154 million people watched the eclipse directly.
- 62 million more watched it on TV or online.
- The response was overwhelmingly positive.


TOTAL SOLAR ECLIPSE
HOW COOL IT IS TO SEE IN PERSON
PARTIAL SOLAR ECLIPSE
LUNAR ECLIPSE
PLANETARY CONJUNCTION
SUPERMOON
HOW COOL IT SOUNDS LIKE IT WOULD BE



Seeing a partial eclipse bears the same relation to seeing a total eclipse as kissing a man does to marrying him.

— *Annie Dillard*

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SOLAR ECLIPSE ACROSS AMERICA

Monday, April 8, 2024: Sun…Moon…*You!*

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ECLIPSE AMERICA | EYE SAFETY | IMAGING & VIDEO | RESOURCES | SOLAR ECLIPSE TASK FORCE | PLANNING WORKSHOPS

- OCTOBER 2023 SOLAR ECLIPSE
- APRIL 2024 SOLAR ECLIPSE
- HOW & WHY ECLIPSES HAPPEN
- THE SOLAR ECLIPSE EXPERIENCE
- A SOLAR ECLIPSE GLOSSARY

565

Days to the Next U.S. Solar Eclipse

Two major solar eclipses are coming to North America! On Saturday, October 14, 2023, an annular ("ring of fire") eclipse sweeps from Oregon to Texas in a 125-mile-wide path that continues to the Yucatán peninsula and northern South America. Six months later, on Monday, April 8, 2024, a total solar eclipse darkens a 115-mile-wide swath from Mexico to the Canadian maritimes, traversing the U.S. from Texas to Maine in the process. In both cases all of North America will have at least a partial solar eclipse.

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- EYEWEAR & HANDHELD VIEWERS
- ARE MY SOLAR VIEWERS SAFE?
- REPUTABLE VENDORS OF SOLAR VIEWERS
- PROJECTION: PINHOLE & OPTICAL
- SOLAR FILTERS FOR OPTICS

565

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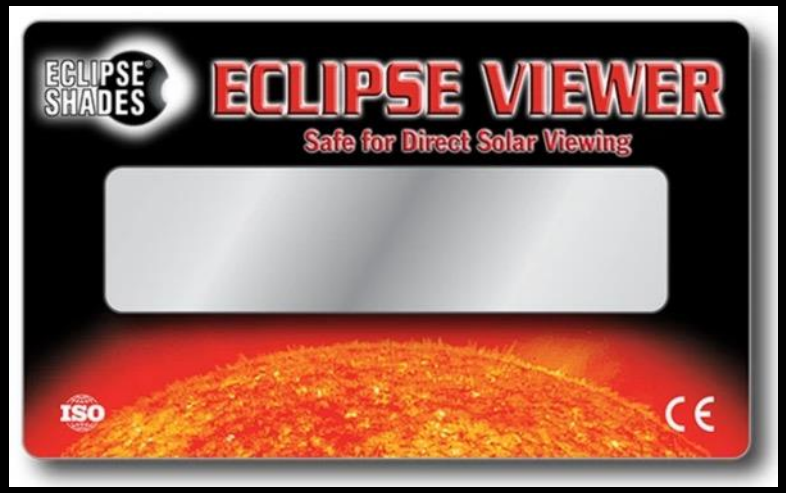
Get your eclipse glasses/viewers *early!*



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Reputable Vendors of Solar Filters & Viewers

Here you'll find lists of reputable manufacturers of solar filters and viewers; these include companies with which members of the AAS Solar Eclipse Task Force have had prior (and positive!) experience as well as companies whose products have been certified safe by authorities we recognize and whose certification we have confirmed to be genuine. *Your eyes are precious!* You don't need astronomers to tell you that, but you *do* need astronomers to tell you where to get safe solar filters: from the companies listed on this page. To do otherwise is to take unnecessary risks. If a supplier isn't listed here, that doesn't mean its products are unsafe — only that we have no knowledge of them or that we haven't confirmed that their products meet the transmission requirements of the ISO 12312-2 international safety standard. For more information see our Eye Safety pages.

"Eclipse Glasses" & Handheld Viewers

The following telescope and solar-filter companies manufacture and/or sell eclipse glasses (sometimes called eclipse shades) and/or handheld solar viewers that have been verified by an accredited testing laboratory to meet the ISO 12312-2 international safety standard for such products. They are listed in alphabetical order; those with an asterisk (*) are based outside the United States.

- American Paper Optics (Eclipser) / EclipseGlasses.com / 3dglassesonline.com
- American Paperwear (Solar Eclipse Glasses)
- APM Telescopes (Sunfilter Glasses)*
- Baader Planetarium (AstroSolar Silver/Gold Film)* [see note 1]

Top U.S. suppliers:

- American Paper Optics
- Rainbow Symphony

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- APPS & SOFTWARE
- BOOKS & ARTICLES
- DOWNLOADS
- EDUCATIONAL MATERIALS & VIDEOS
- IMAGES & VIDEOS (ROYALTY-FREE)
- MAPS & CALCULATORS
- PODCASTS, WEBCASTS & WEBINARS
- SOLAR FILTERS & VIEWERS
- TELESCOPES & BINOCULARS
- WEBSITES

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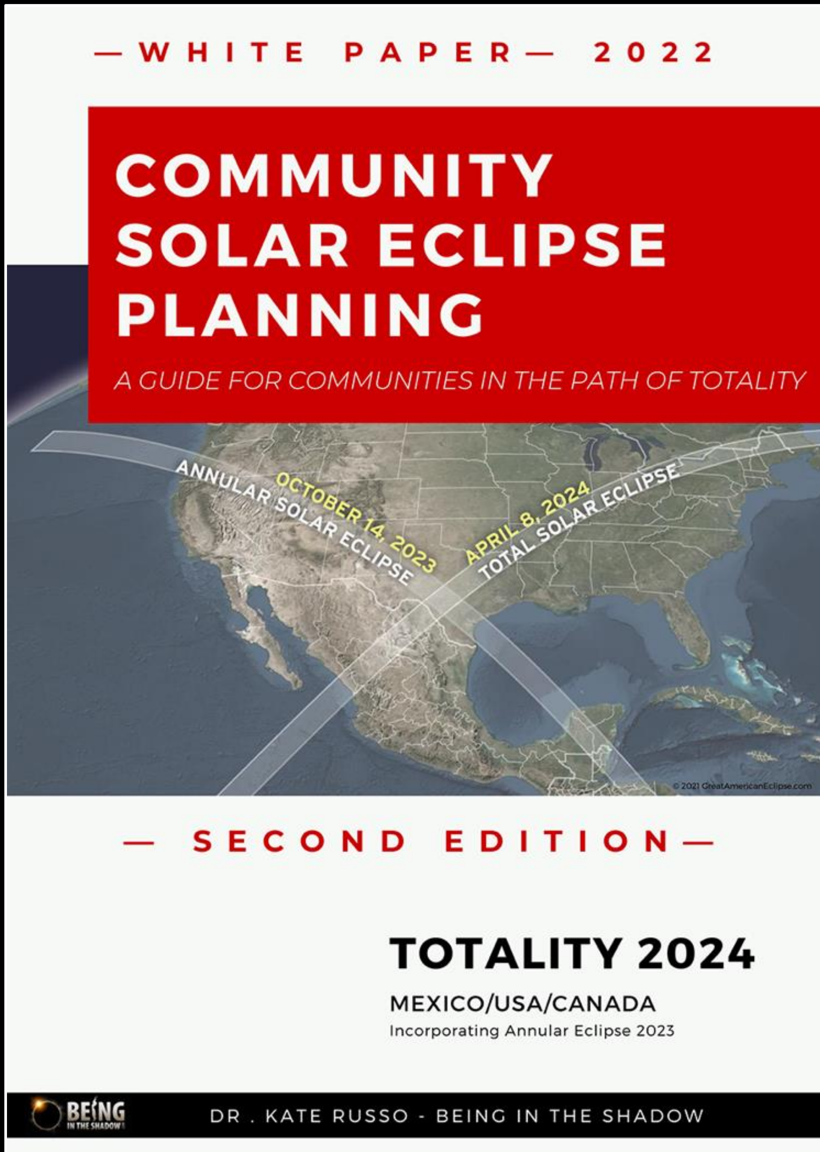
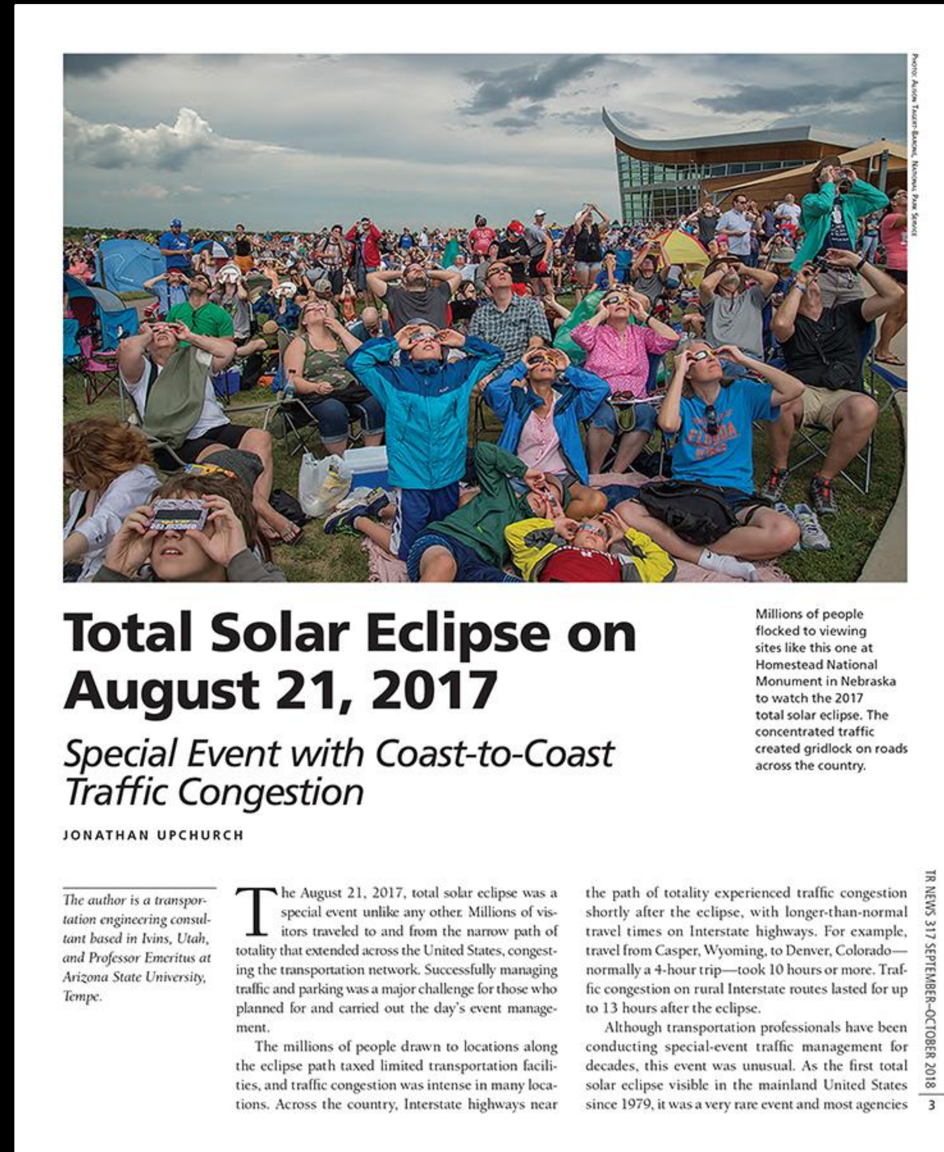


Fail to plan = Plan to fail!



Total Solar Eclipse on August 21, 2017

Special Event with Coast-to-Coast Traffic Congestion

Millions of people flocked to viewing sites like this one at Homestead National Monument in Nebraska to watch the 2017 total solar eclipse. The concentrated traffic created gridlock on roads across the country.

JONATHAN UPCHURCH

The author is a transportation engineering consultant based in Ivins, Utah, and Professor Emeritus at Arizona State University, Tempe.

The August 21, 2017, total solar eclipse was a special event unlike any other. Millions of visitors traveled to and from the narrow path of totality that extended across the United States, congesting the transportation network. Successfully managing traffic and parking was a major challenge for those who planned for and carried out the day's event management.

The millions of people drawn to locations along the eclipse path taxed limited transportation facilities, and traffic congestion was intense in many locations. Across the country, Interstate highways near the path of totality experienced traffic congestion shortly after the eclipse, with longer-than-normal travel times on Interstate highways. For example, travel from Casper, Wyoming, to Denver, Colorado—normally a 4-hour trip—took 10 hours or more. Traffic congestion on rural Interstate routes lasted for up to 13 hours after the eclipse.

Although transportation professionals have been conducting special-event traffic management for decades, this event was unusual. As the first total solar eclipse visible in the mainland United States since 1979, it was a very rare event and most agencies

Arrive early, leave late!

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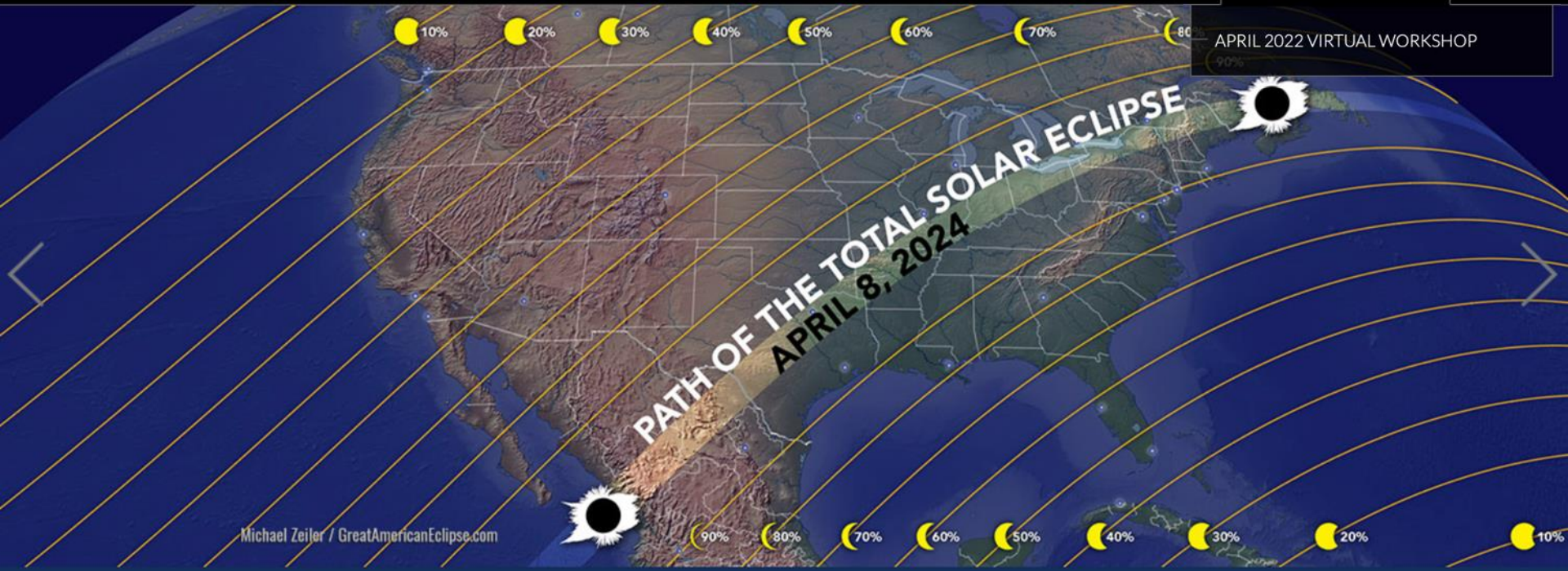
APRIL 2022 VIRTUAL WORKSHOP



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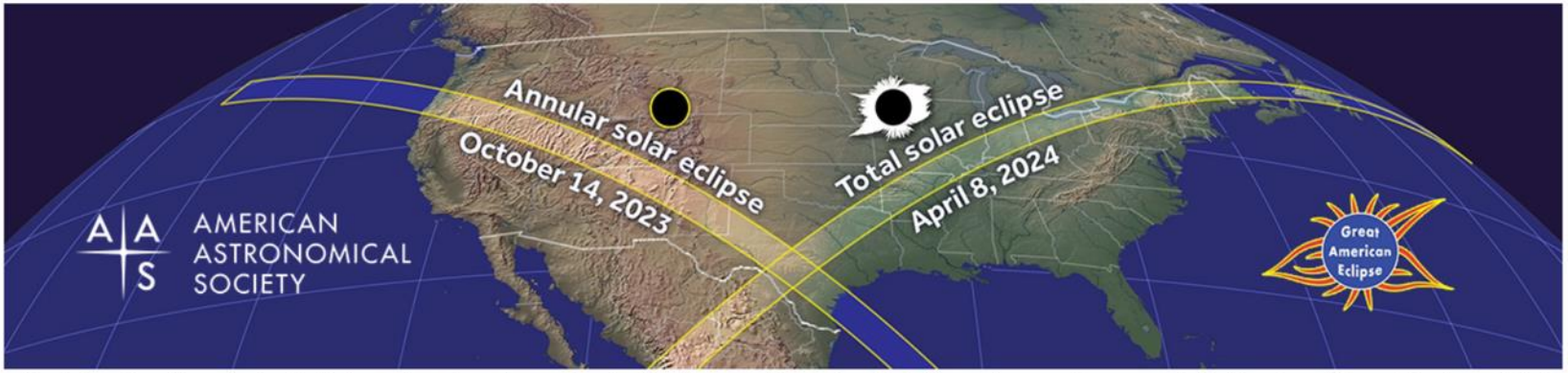
Solar Eclipse Planning Workshop, 8-9 April 2022, Virtually Anywhere

Who Should Attend | How to Register | Registrants List | How to Contribute a Poster | Workshop Program

The American Astronomical Society (AAS) Solar Eclipse Task Force invites you to join us for a virtual eclipse-planning workshop to be held Friday-Saturday, April 8-9, 2022, online via Zoom. This event will bring together astronomers, educators, local and state officials, and others involved (or wanting to become involved) in preparing their communities for the 2023 and 2024 North American solar eclipses. Each day's program will run from 9 am to 2 pm PDT (12 pm to 5 pm EDT) on Zoom, followed by a 2-hour networking and poster session in Gather.

In addition to talks, panel discussions, and breakout sessions on strategies for eclipse-related engagement, we now invite contributed posters (see details below). The oral sessions will focus on best practices in eclipse-related formal and informal education and public outreach, including effective ways to reach underserved and indigenous populations. Newcomers to eclipse planning will learn about the 2023 and 2024 eclipses and about appropriate resources to help their communities prepare for them. Posters will cover the full gamut of eclipse-related topics.



North America will soon be treated to two major solar eclipses, when the Sun, Moon, and Earth align. On both occasions, nearly everyone in the Americas will have at least a partial solar eclipse. Map courtesy Michael Zeiler, GreatAmericanEclipse.com.

Public Talk
April 8th
7 pm EDT

eclipse.aas.org/youtube

We are particularly keen to welcome workshop participants from Canada and Mexico, as both the October 2023 ASE and April 2024 TSE grace one or both of those countries too. And we welcome community leaders and other stakeholders both inside and outside the paths of annularity (2023) and/or totality (2024).

Upcoming Workshops

- **April 8-9, 2022, Virtually Anywhere** (host: AAS Solar Eclipse Task Force)
- October 21-22, 2022, Rochester, New York (host: Rochester Museum & Science Center)
- Spring 2023, Cleveland, Ohio (hosts: Great Lakes Science Center, NASA Glenn Research Center)
- October 27-28, 2023, Bretton Woods, New Hampshire (hosts: Appalachian Mountain Club, NH Solar Eclipse Task Force, Mountains of Stars)
- January 2024, 243rd AAS Meeting, New Orleans, Louisiana (host: American Astronomical Society)

Recent Workshops

- **2021 Solar Eclipse Planning Workshop** (9-10 April 2021, Virtually Anywhere)
- **2019 Solar Eclipse Planning Workshop** (8-9 June 2019, St. Louis, Missouri)

Workshop in New Hampshire!
October 27-28, 2023

More About the AAS Solar Eclipse Planning Workshops

According to a survey conducted by researchers at the University of Michigan, more Americans watched the August 21, 2017, solar eclipse than tuned in to any previous scientific, athletic, or entertainment event. From Oregon to South Carolina some 20 million people witnessed totality, or "darkness at midday," when the Moon completely covered the Sun's bright face. For more than 2 minutes, these lucky skygazers enjoyed a truly awesome sight: the diaphanous solar corona surrounding the black silhouette of the Moon in a twilight-blue sky with pastel sunset colors all around the horizon.

Scenes from the June 2019 eclipse planning workshop in St. Louis, Missouri. AAS photos by Rick Fienberg.

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- APPLY TO JOIN A WORKING GROUP
- JOIN OUR EMAIL LIST

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2017 Solar Eclipse Research

State Agency Coordination

Solar Eclipse Branding & Industry Support

New Hampshire

TOTAL SOLAR ECLIPSE

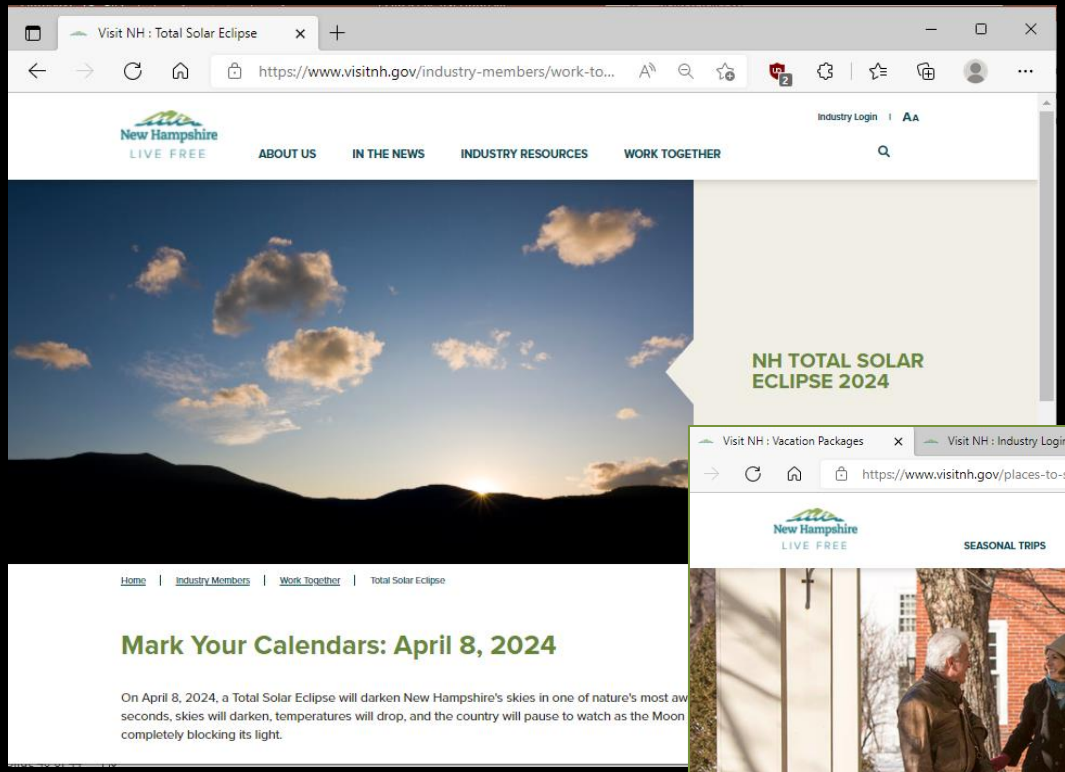
APRIL 8, 2024

603

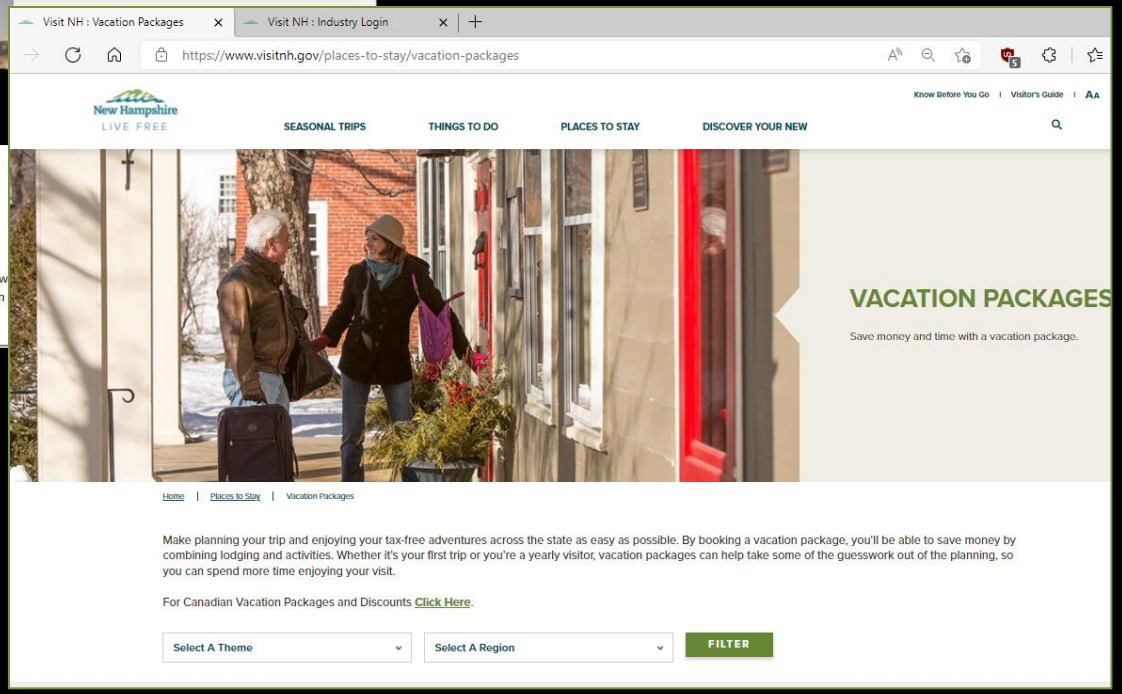
SOLAR ECLIPSE

4/8/24 • NEW HAMPSHIRE

What Can You Do?

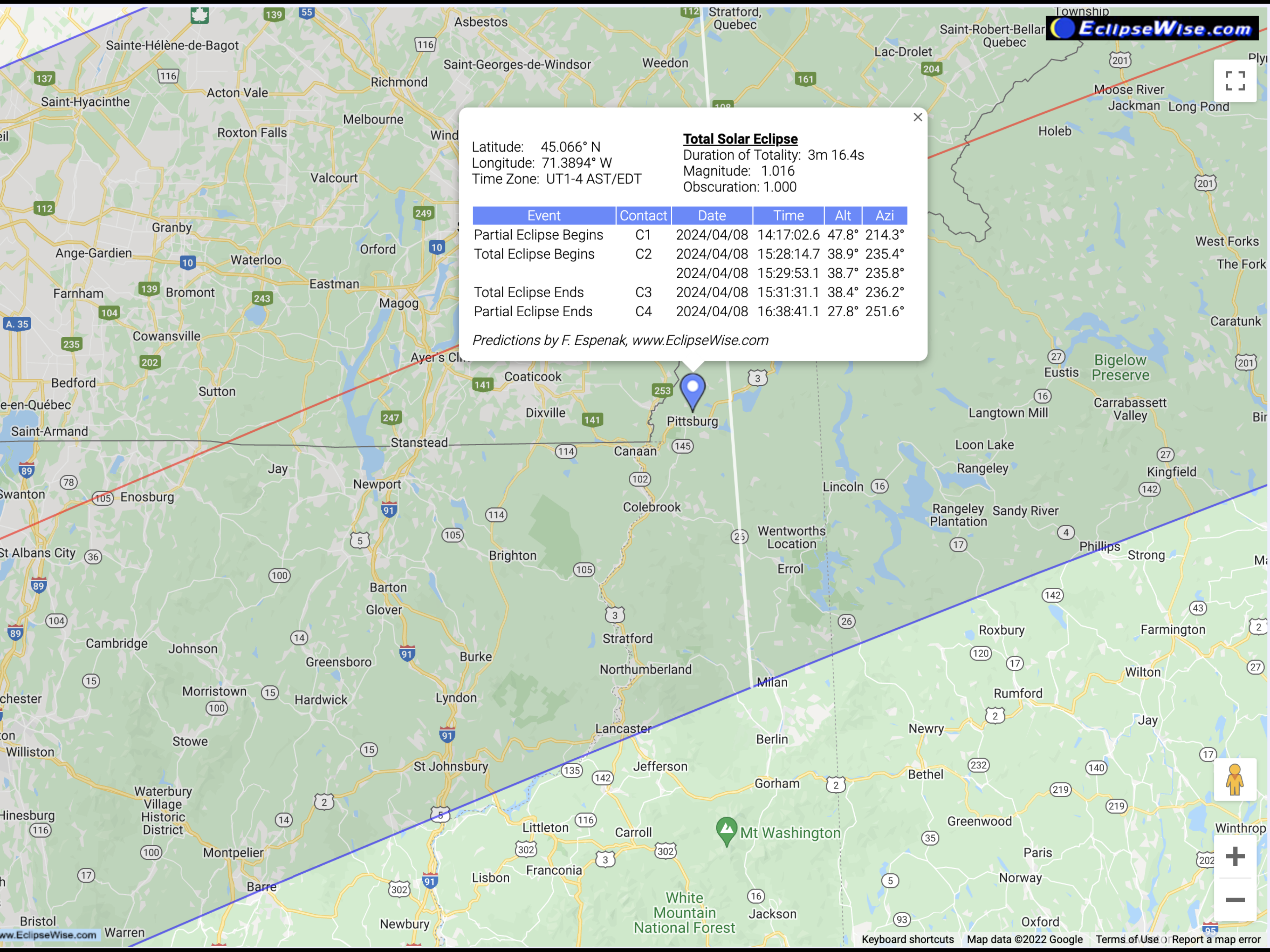


Packages



VisitNH.gov

Rick’s Extra Slides



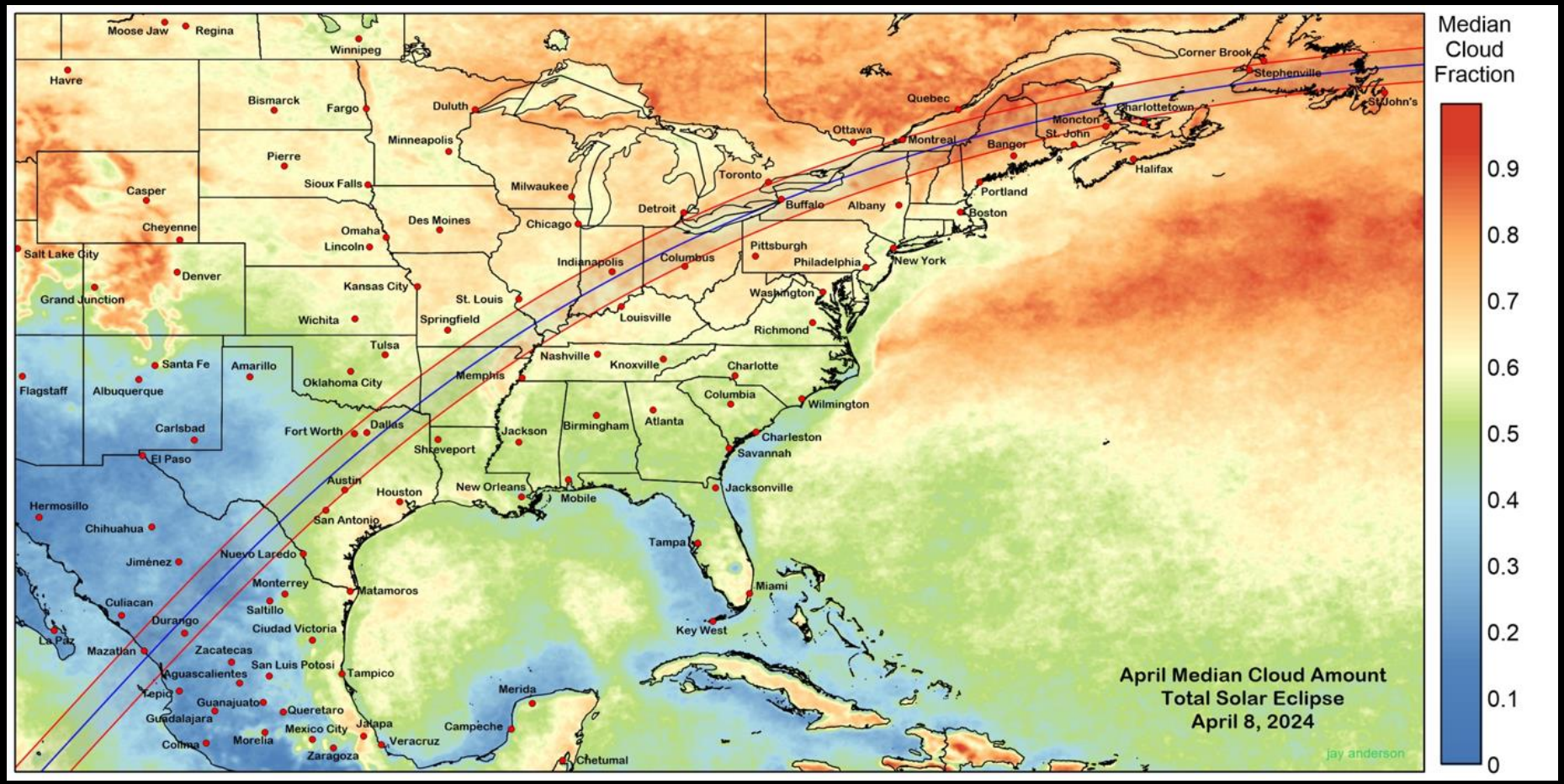
Latitude: 45.066° N
Longitude: 71.3894° W
Time Zone: UT1-4 AST/EDT

Total Solar Eclipse
Duration of Totality: 3m 16.4s
Magnitude: 1.016
Obscuration: 1.000

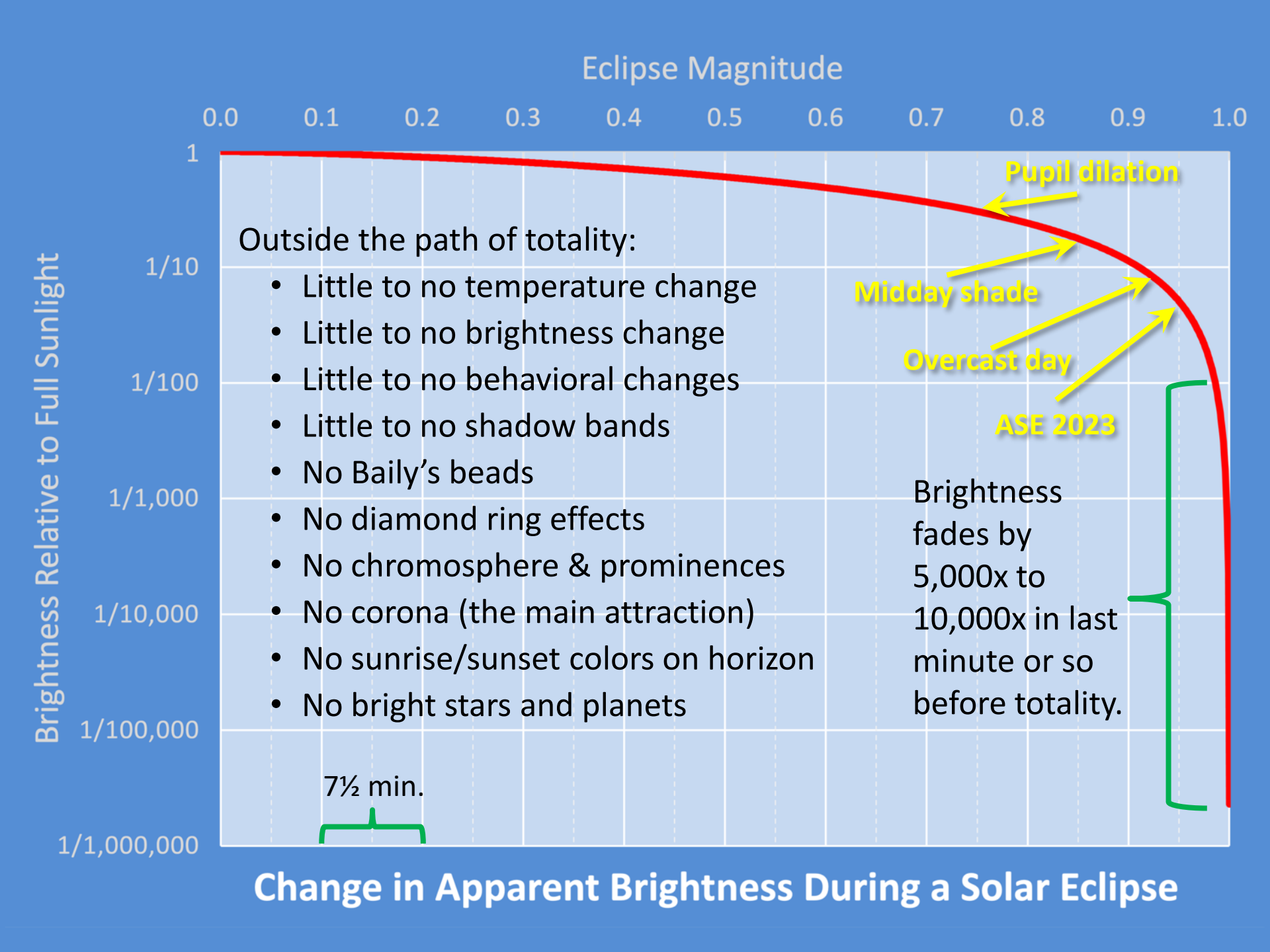
Event	Contact	Date	Time	Alt	Azi
Partial Eclipse Begins	C1	2024/04/08	14:17:02.6	47.8°	214.3°
Total Eclipse Begins	C2	2024/04/08	15:28:14.7	38.9°	235.4°
		2024/04/08	15:29:53.1	38.7°	235.8°
Total Eclipse Ends	C3	2024/04/08	15:31:31.1	38.4°	236.2°
Partial Eclipse Ends	C4	2024/04/08	16:38:41.1	27.8°	251.6°

Predictions by F. Espenak, www.EclipseWise.com

Typical Cloud Fraction on April 8th



Best viewing locations for this eclipse: Texas and Mexico


Eclipse Magnitude
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Brightness Relative to Full Sunlight
1
1/10
1/100
1/1,000
1/10,000
1/100,000
1/1,000,000
Pupil dilation
Midday shade
Overcast day
ASE 2023
Outside the path of totality:
• Little to no temperature change
• Little to no brightness change
• Little to no behavioral changes
• Little to no shadow bands
• No Baily's beads
• No diamond ring effects
• No chromosphere & prominences
• No corona (the main attraction)
• No sunrise/sunset colors on horizon
• No bright stars and planets
Brightness fades by 5,000x to 10,000x in last minute or so before totality.
7½ min.
Change in Apparent Brightness During a Solar Eclipse

More Information

Information Links
https://eclipse.aas.org/
https://eclipse.aas.org/workshops/2022
https://eclipse.aas.org/resources/downloads#white_paper
https://www.youtube.com/watch?v=QZJxVRPkXzw
http://eclipsewise.com/eclipse.html

Maps
http://xjubier.free.fr/en/site_pages/SolarEclipsesGoogleMaps.html
http://xjubier.free.fr/en/site_pages/solar_eclipses/TSE_2024_GoogleMapFull.html?Lat=45.93887&Lng=-69.53438&Zoom=8&LC=1
https://nso.edu/eclipse-map-2024/

Publications
https://www.beingintheshadow.com/
https://eclipse.aas.org/sites/eclipse.aas.org/files/Russo-White-Paper-Community-Eclipse-Planning.pdf

Solar Filters
https://spectrumtelescope.com/shop/
http://thousandoaksoptical.com/shop/solar-filters/bulk-rolls/

https://www.ebay.com/itm/233923682383?chn=ps&norover=1&mkevt=1&mkrid=711-117182-37290-0&mkcid=2&itemid=233923682383&targetid=1068833113859&device=c&mktype=pla&googleloc=9019169&poi=&campaignid=11615951275&mkgroupid=116843212927&rlsatarget=pla-1068833113859&abcId=9300457&merchantid=114599598&gclid=Cj0KCQjwmcWDBhCOARIsALgJ2Qe6QarX8PKERHWG-jEoB4sWlq5s-qHM10K9G7aL-_QrniPL8NbuQZgaAok6EALw_wcB