The Great North American Solar Eclipse of 2024

Part 2 - Lessons Learned from The Great American Solar Eclipse of 2017

The Great American Solar Eclipse of 2017

The Collective Experience of the Howard Astronomical League

Jim Johnson

HAL General Meeting

Sept 21, 2017

July 21, 2022

Background image derived from HDR Corona by Ken Everhart

Purpose, Scope and Sources

Purpose: To summarize and present HAL's collective solar eclipse experience in a one-hour presentation.

Sources:

- Howardastro@yahoogroups.com emails,
- Information sent directly to me,
- HAL Facebook page, and
- Word of mouth

Contributions from over 30 members and guests

- A variety of narratives
- Hundreds of images

Purpose: To to explore how HAL members and guests prepared for the 2017 eclipse, traveled to eclipse viewing sites, and dealt with difficulties that were encountered five years ago, and how these lessons might be applied to preparations for the 2024 eclipse.

Context:
Part 1 of this series, presented at the June 21, 2021 meeting, provided solar eclipse basics. Part 3 of this series will be a post-eclipse wrap up of HALs 2024 experience.

Caveats

- Limited to the input that received from members and guests
- Had to be selective to scale to a 1-hour presentation
  - Dozens of stories
  - 100s of photos

I hope to have dozens of stories and 100s of photos available for preparing Part 3!

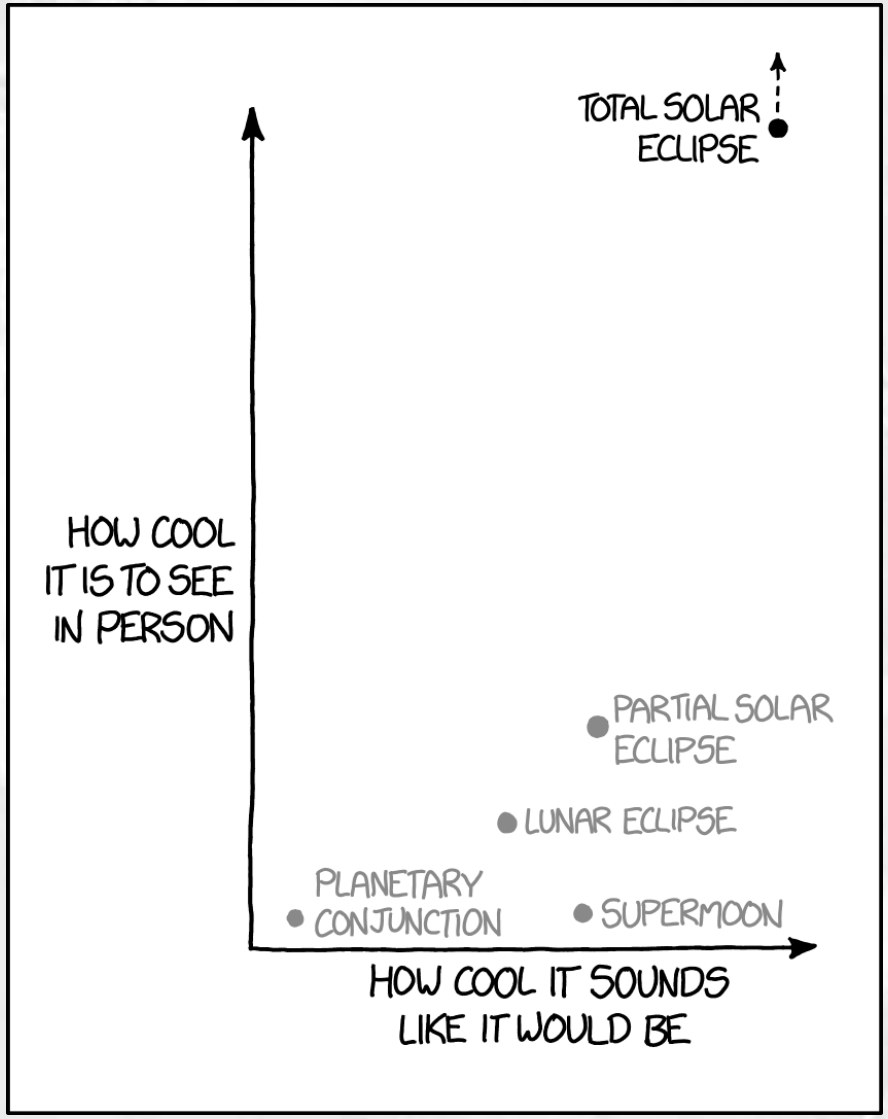
- No further curation of photos or narratives received – post for public access:
  - Reports emailed to howardastro@yahoogroups.com are available at https://groups.yahoo.com/neo/groups/howardastro/conversations/messages
  - Images can be posted to HAL Gallery: https://www.howardastro.org/halgal/main.php

Presentation Overview

- Before, During and After the Eclipse
- Lessons Learned
- Preview, April 8th, 2024

Format: Open discussion after each topic – what can you add to the story?

Bottom Line Up Front



From xkcd.com
Contributed by Wayne Baggett

Eclipse Overview

See Part 1 of this series for a detailed 2024 eclipse overview.

- First total eclipse on the US mainland since 1979
- First coast-to-coast total eclipse since 1918
- Path of Totality
  - US only, hence the Great American Eclipse of 2017
  - 12 million people live in the path of totality
  - 2 – 7 million expected to travel to the path
- Heavy traffic expectations reported in the press

Typical News Headlines

Here's how to avoid wrecking your car during the eclipse. The Verge (August 17, 2017).

Eli Manning Expected to Eclipse 50000 Passing Yards in 2017. Bleacher Report (September 7, 2017).

How to Watch the Eclipse if You're Stuck Indoors (or It's Cloudy). New York Times (August 6, 2017).

Slackers' guide to the 2017 solar eclipse. CNN (August 9, 2017).

How This Tiny Rural Town Is Bracing for an Eclipse Influx. NBCNews.com (August 18, 2017).

Still need a pair of solar eclipse glasses – here's where to find them. Washington Post (August 17, 2017).

The Procrastinator's guide to viewing the solar eclipse. USA Today (August 20, 2017).

Why Some Say the Eclipse Is Best Experienced in a Crowd. New York Times (August 14, 2017).

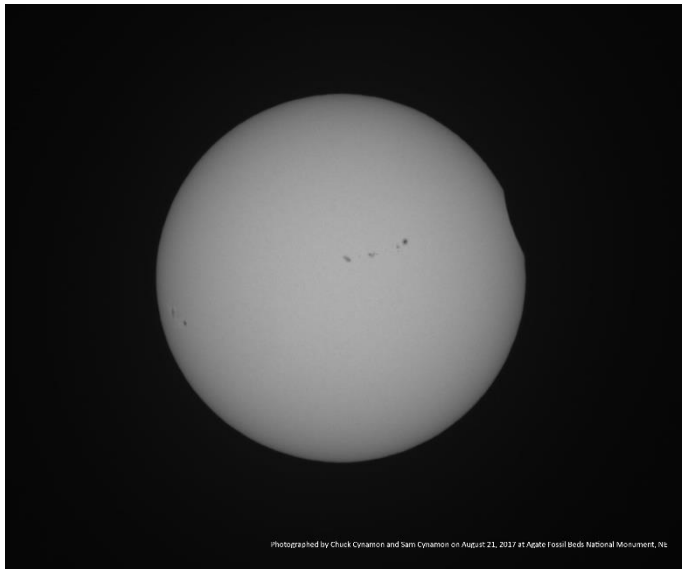
Cynamon Solar Eclipse Experience

Citizen Continental-American Telescope Experiment (CATE)

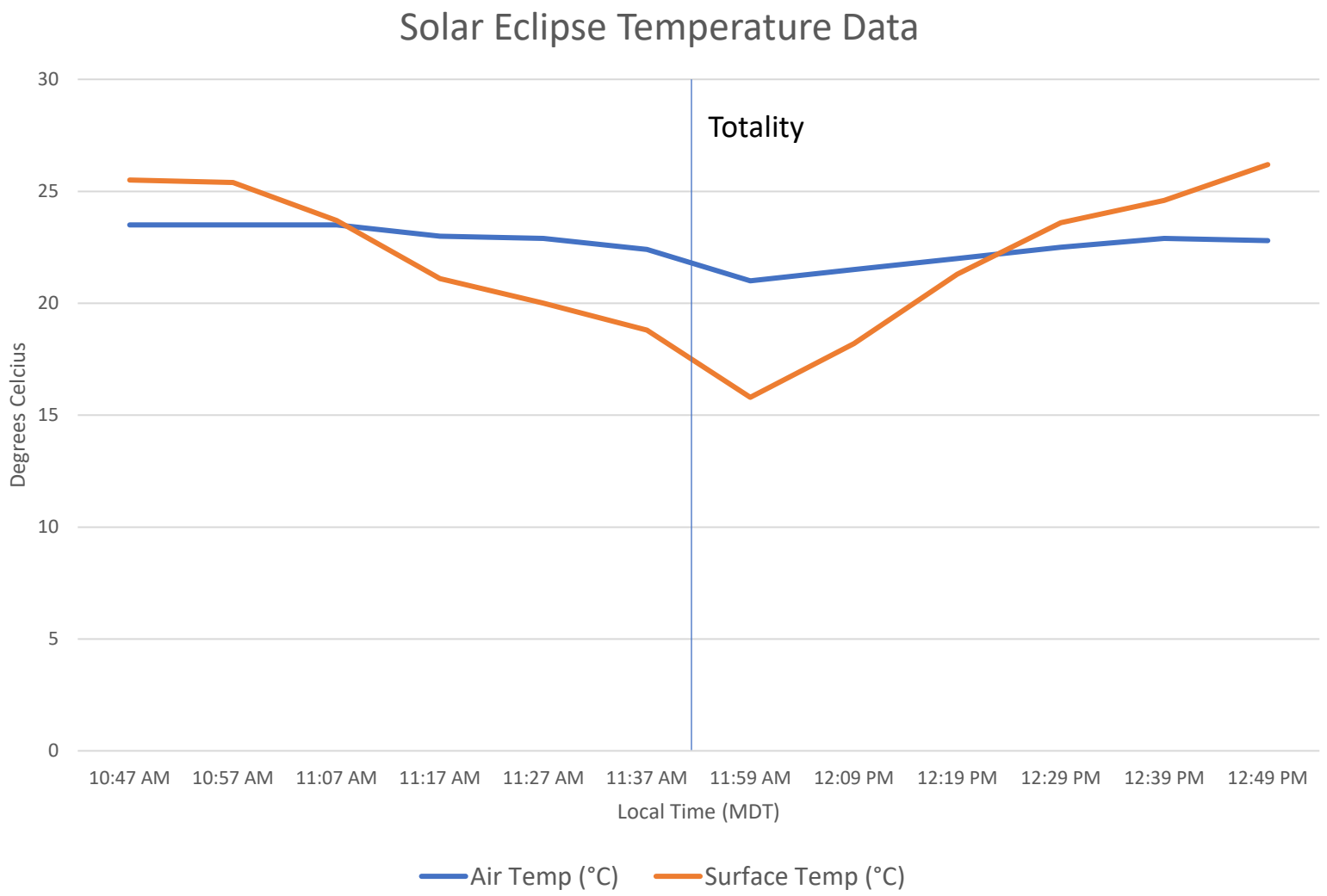
- National Solar Observatory (NSO) PI (Matt Penn) –
  - NSF/NASA sponsored
- 68 identically-equipped sites
  - Daystar 80mm APO refractor
  - Celestron Omni CG4 mount
  - Point Grey 5MP Grasshopper3 camera, triggered by Arduino GPS device
- Science, equipment and procedure verified during 2015 eclipse (Iceland)
- Multi-site and STEM student operations verified in 2016 eclipse (Indonesia)
- 56 of 68 sites successfully collected and uploaded 2017 eclipse data
- 90-minute continuous inner corona movie to be produced

Citizen CATE (Site #24) – Agate Fossil Beds Nat'l Mon, NE

Solar Eclipse Photos



GLOBE Citizen Science Data Collection



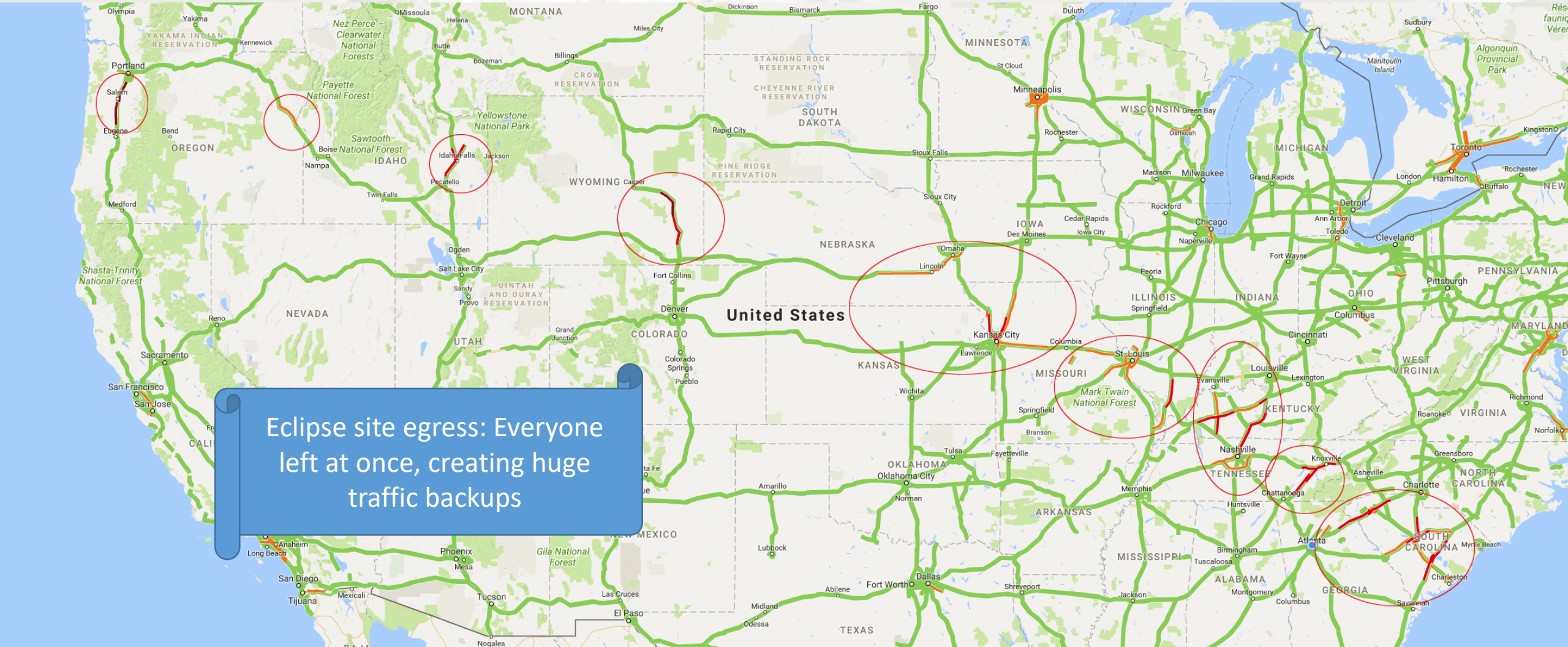
We Made People Connections

- Many favorable descriptions of interactions with other viewers
- Met people from many other countries and states, and even from home towns
- HAL legends – Cofounders, some of whom have since moved away reconnected via email on eclipse day

Where we were when it happened

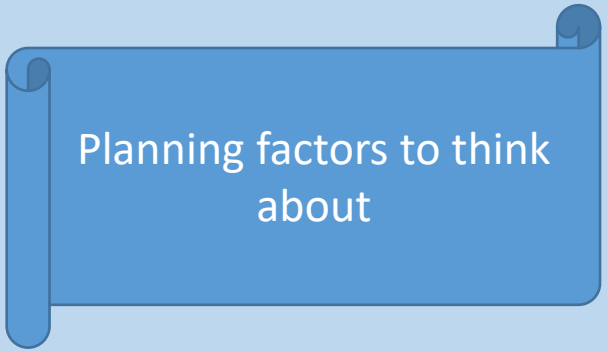
Eclipse site ingress: Crowds trickled in, so no problems getting in until the final hours before totality.

And where we sat when it was over…



We invested an astounding amount of time into eclipse planning!

- Picking viewing sites based on
  - Travel and weather contingencies
  - Climate considerations
  - Locations of friends and family
  - Concurrent with other travel
- Photography
  - Equipment
  - Techniques
  - Objectives



- Anticipating loss of connectivity
  - Carried an atlas with the path of totality annotated
  - Downloaded Google Maps data for travel areas
- Other
  - Detailed packing lists
  - Detailed checklists
  - Packed camping gear

Lodging Reservations

Lesson Learned: Book reservations early!

Chris Todd (Pres, HAL) presentation two years ago – make reservations early

- One as early as 18 months prior – direct contact with hotel management
- Most reservations were completed as soon as reservation books were open 12 months prior
- One reservation noted as booked as late as 8 months before

Some venues booked up by September 2016

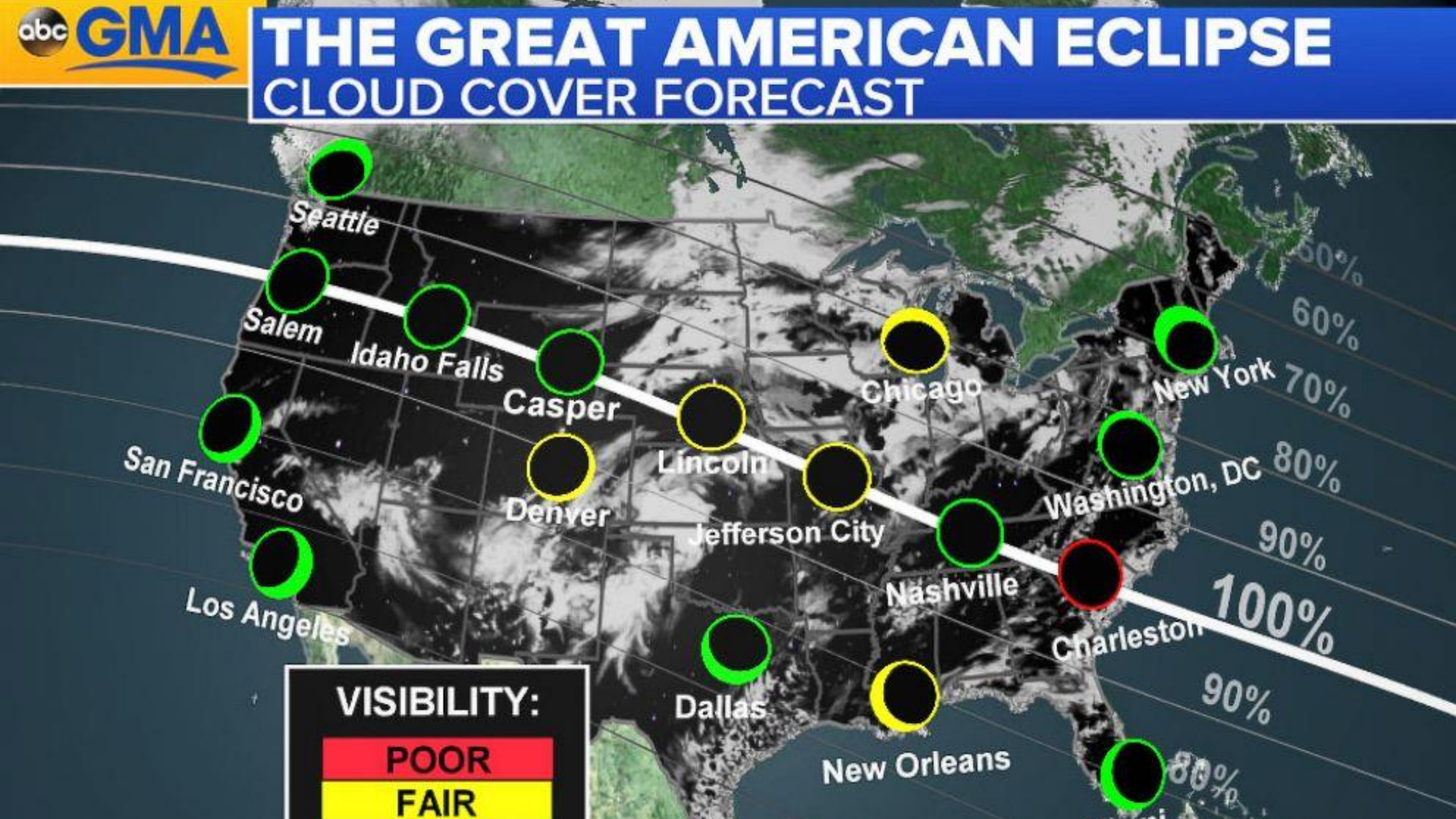
Reports of long-standing reservations made at lower rates being cancelled/replaced with higher rate reservations just prior to eclipse.

No HAL reports of lodging difficulties

Weather:

Some weather factors to think about.

- Probably the greatest source of eclipse anxiety
- Long term planning for weather
  - Climatology influenced site selections
  - Some travel plans included last-minute weather considerations
- The week prior
  - Much hand wringing and divining of weather forecasts
  - Much discussion in the halastro email group


abc GMA
THE GREAT AMERICAN ECLIPSE
CLOUD COVER FORECAST
Seattle
Salem
Idaho Falls
Casper
Chicago
New York
San Francisco
Denver
Lincoln
Jefferson City
Washington, DC
Nashville
Charleston
Los Angeles
Dallas
New Orleans
50%
60%
70%
80%
90%
100%
90%
80%
VISIBILITY:
POOR
FAIR

Unfavorable Weather Advice

From Bob Prokop, HAL Observing Chair on Aug 18th:

56% cloud cover predicted for where I'll be (Jefferson City, Missouri) at 1 PM Monday. So it's basically a coin toss as to whether I'll see totality. So I've been reading on line about the best way to observe a clouded out total eclipse. All the advice says: get out of the city into the countryside. Listen to the insects and the birds. They will respond with a loud chorus. Feel the temperature drop and the increase in wind speed. Experience the sudden onset of darkness. Watch for the onrushing shadow in the clouds.

There's no reason to despair if you can't see the solar corona. There is so much more to a total solar eclipse that can still be observed and appreciated.

Bob

Weather

Lesson Learned: Have a backup plan if there is inclement weather at your primary site.

- On eclipse morning
  - Most had favorable forecasts at their primary viewing location
  - Some elected to “run” to more favorable skies – just couple of hours drive
    - One person had contingency plan to ditch family in Charleston and drive NW if needed
    - All who reported driving to achieve better conditions were able to see totality

- Totality
  - Only a few of the sites that had been abandoned turned out to be clouded out
  - Some places with sketchy weather forecasts turned out ok
  - No reports from anyone who was clouded out

Eye safety

Lesson Learned: Be extra super careful!

- Viewing the partial phases of the eclipse is inherently dangerous, and must be done correctly to prevent injury
- Lots of emphasis in the media, HAL presentations, and discussions
- Good news – no eye injuries reported
- Close call - One person reported being zapped, but not injured when looking into an eyepiece at C3.

Eclipse Shades

Lesson Learned: Do not wait until the last minute to obtain solar-eclipse related materials.

- Probably the second greatest source of eclipse anxiety
- Much discussion and news reporting about eclipse safety
  - Must have ISO 1231201 and must be from a reputable source
  - Late-game Amazon recall
  - Viewers were left scrambling to recover
  - A couple of dozen HAL emails Aug 13th to Aug 16th
- As of HAL Meeting, Thursday, Aug 17th
  - RNC had acquired and sold 800 pairs
  - Chuck Cynamon brought about 500 pairs to the meeting
- After the eclipse – donate to Astronomers without Borders?
  - Company Seven – Martin Cohen is organizing a collection effort

Traffic

Lesson Learned: Have ingress and egress traffic plans.

- Ingress
  - Some reports indicated travel to the site a day or more before the eclipse
  - Viewer build up at sites was spread out over days and hours prior to the eclipse
  - Almost no ingress problems, even on the morning of the eclipse
  - Some late-game location change decisions were made due to traffic concerns
  - One almost problem – elected to stop and set up 15 miles from the centerline – still a win!

- Egress
  - The multi-day, multi-hour build up was unwound in just an hour or so
  - For those who needed to get back on the road after the eclipse, the drive time back to the point of origin was about double the time to get to the viewing location

Viewing site formats

Things to think about.

- Hotel parking lots
  - One instance of a specific hotel and parking spot picked over a year beforehand
- Example of a spontaneous gathering
  - I-40 rest area near Gordonsville, TN
  - 2-3,000 people, Hwy Patrol ceased admissions circa 10am
- Public parks
- Public schools
  - Open in some states,
  - Schools closed in some locations, parking lot entrances blocked
- Organized events – parking, restrooms/porta potty, some included entertainment
- Rocky Mountians – 8,400’ ridge
- Gas Station – in exchange for eclipse images
- Cabin in Smoky Mountains
- RV Rental – pick up in Baltimore and drive out west

Outreach Efforts

Opportunities to look for ahead of time.

- Some ad hoc
  - Lesson on how to take smartphone images during partial phases
  - Discussions with eclipse-viewing neighbors
  - One report of many smartphone photographers imaging at the eyepiece
  - Many reports of sharing telescopic views with other participants

- More formal
  - Relationships with organized events (in exchange for prime setup/parking arrangements)

What we saw…

…and what you can expect to see

Collectively, we observed everything that was expected to be seen

- Crescent projections on the ground
- Approaching shadow, Bailey's Beads/Diamond Ring
- Corona, prominences
- Changing light, cooling effect, darkness,
- Stars, planets
- Crowd reactions, animal behaviors
- 360 degree sunset effect
- Shadow bands

What we missed…

- Some reported missing certain things:
- Looked for it, but couldn’t see it: E.g., Mercury, shadow bands
- Forgot to look for it: Prominences, shadow bands
  - Reason – of course I forgot, I had just lost my mind

An eloquent description of an eclipse experience:

Wayne Baggett, from Glendo, WY:

We experienced virtually every sensation reported for solar eclipses. As totality approached, the temperature dropped and the wind died down to virtually calm. The light took on a very strange cast to it, being somewhat pink a few moments prior to totality and the shadows looking funny (dim light with a strangely-shaped light source). The crickets started chirping, and the pronghorn antelope began running (probably just a coincidence :)). A few seconds before totality, the dirt road was filled with the shimmering of shadow bands -- it was really quite eerie! We had a spectacular diamond ring to start totality, and at least one prominence was visible by naked eye (probably the "Dolphin" prominence). **The corona seemed to materialize out of nowhere as a ghostly white glow with a very prominent extension to the southwest of the sun. The moon was the darkest black I think I have ever seen -- it appeared as a circular rift in the very fabric of the universe. It was almost frightening.** Totality ended WAAAY too soon with another spectacular diamond ring, and the show was effectively over.

Selected Members' and Guests' Eclipse Photos

Chris Storey, Threatening Clouds

Experts advise leaving photography to the experts so that technology does not detract from the eclipse experience.

Phil Whitebloom, No Solar Photography

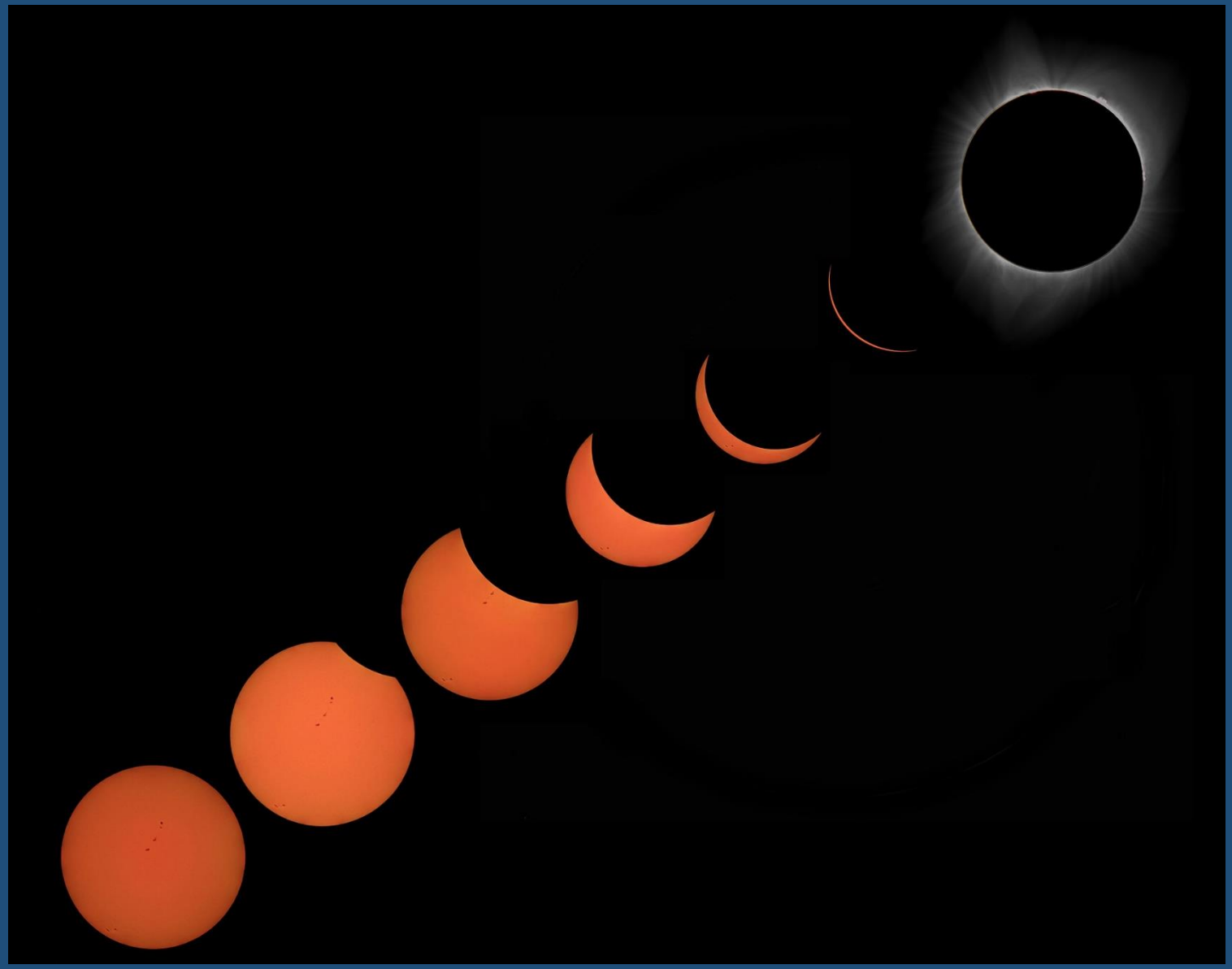
Bob Savoy, Ingress Traffic

Tom McShane, Straw Hat Projection

Keith Evans, Colander Projection

Gene Handler, Time Lapse

Jim Tomney, First Bite



Richard Orr, Sequence

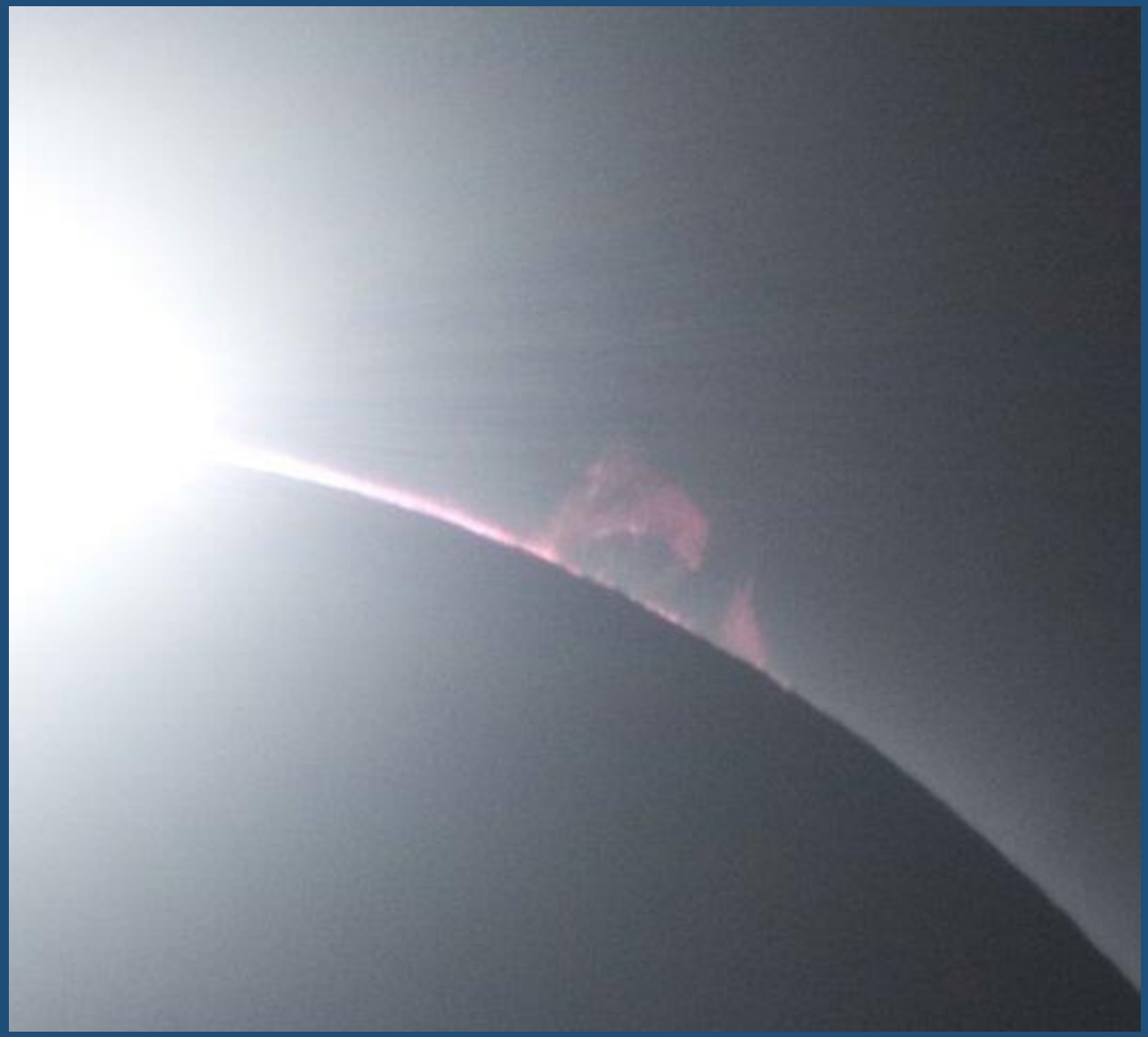


Bob Prokop, Public Outreach

Smartphone photos at Bob’s eyepiece taken by others and shared with Bob.

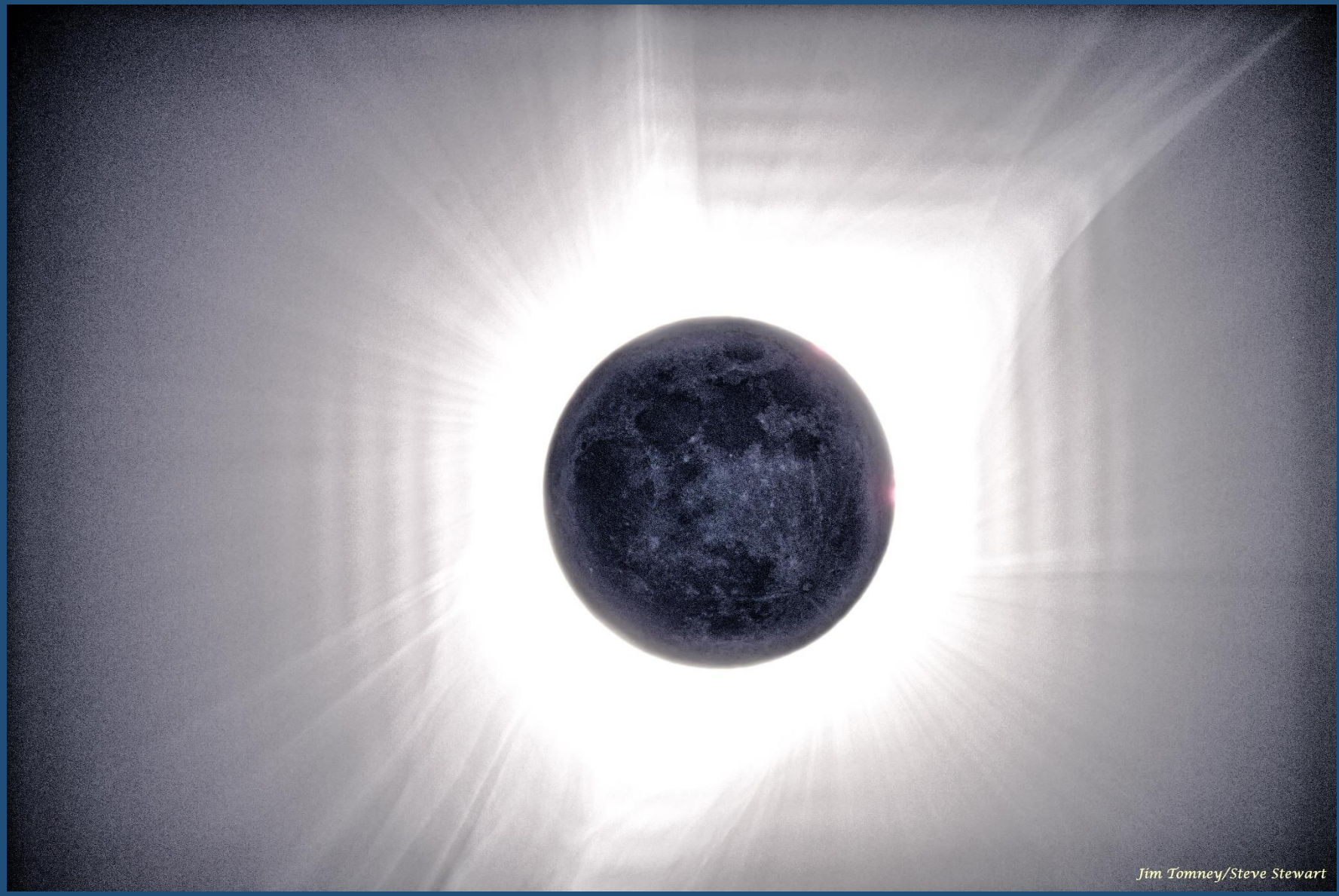
Jackie Telford, Diamond Ring after 3rd Contact

Matt Krutar., Dolphin Prominence



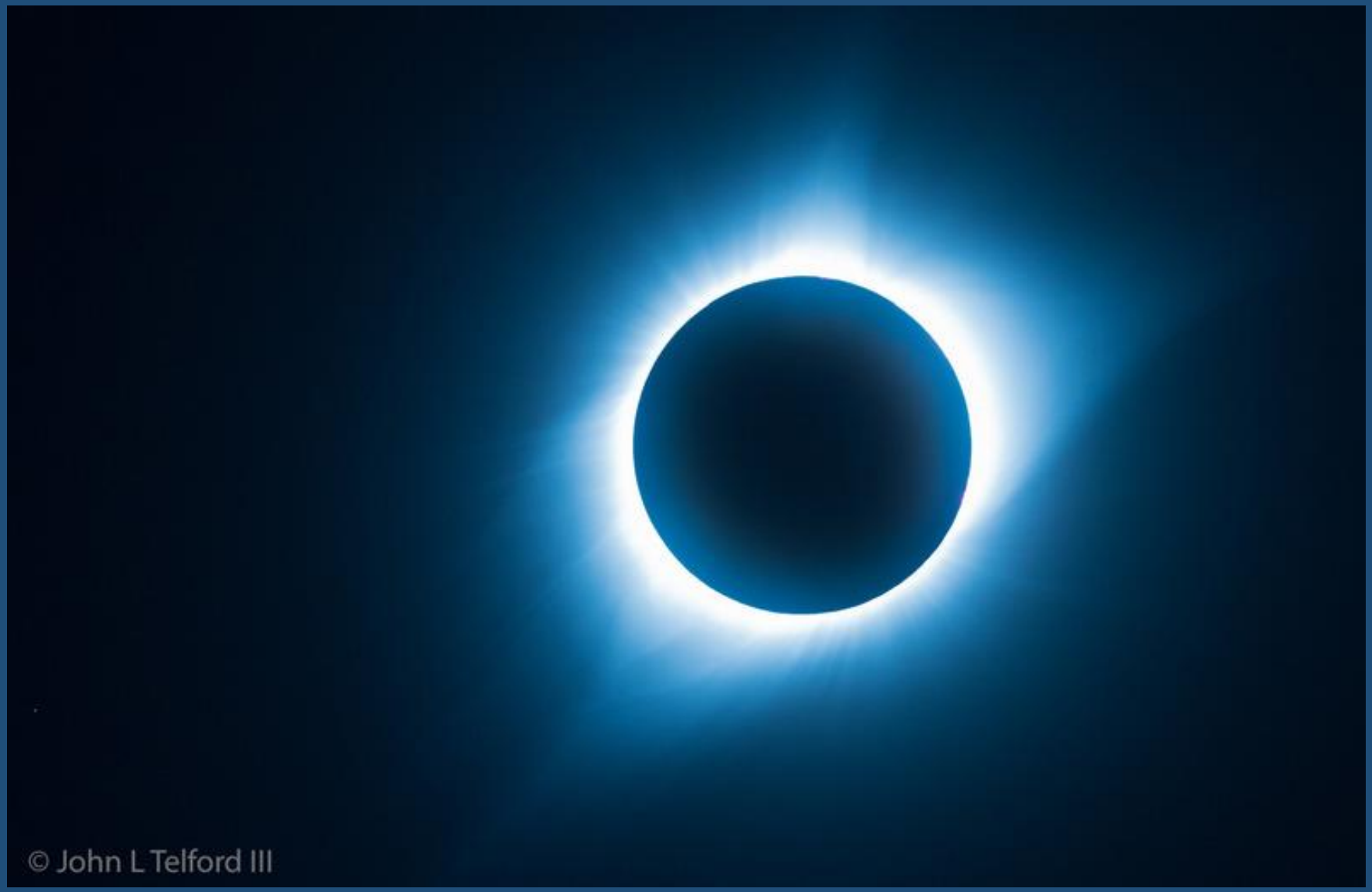
James Willinghan, Eclipse Dolphin

Shared by Keith Evans. Photosphere, Chromosphere, and Prominences

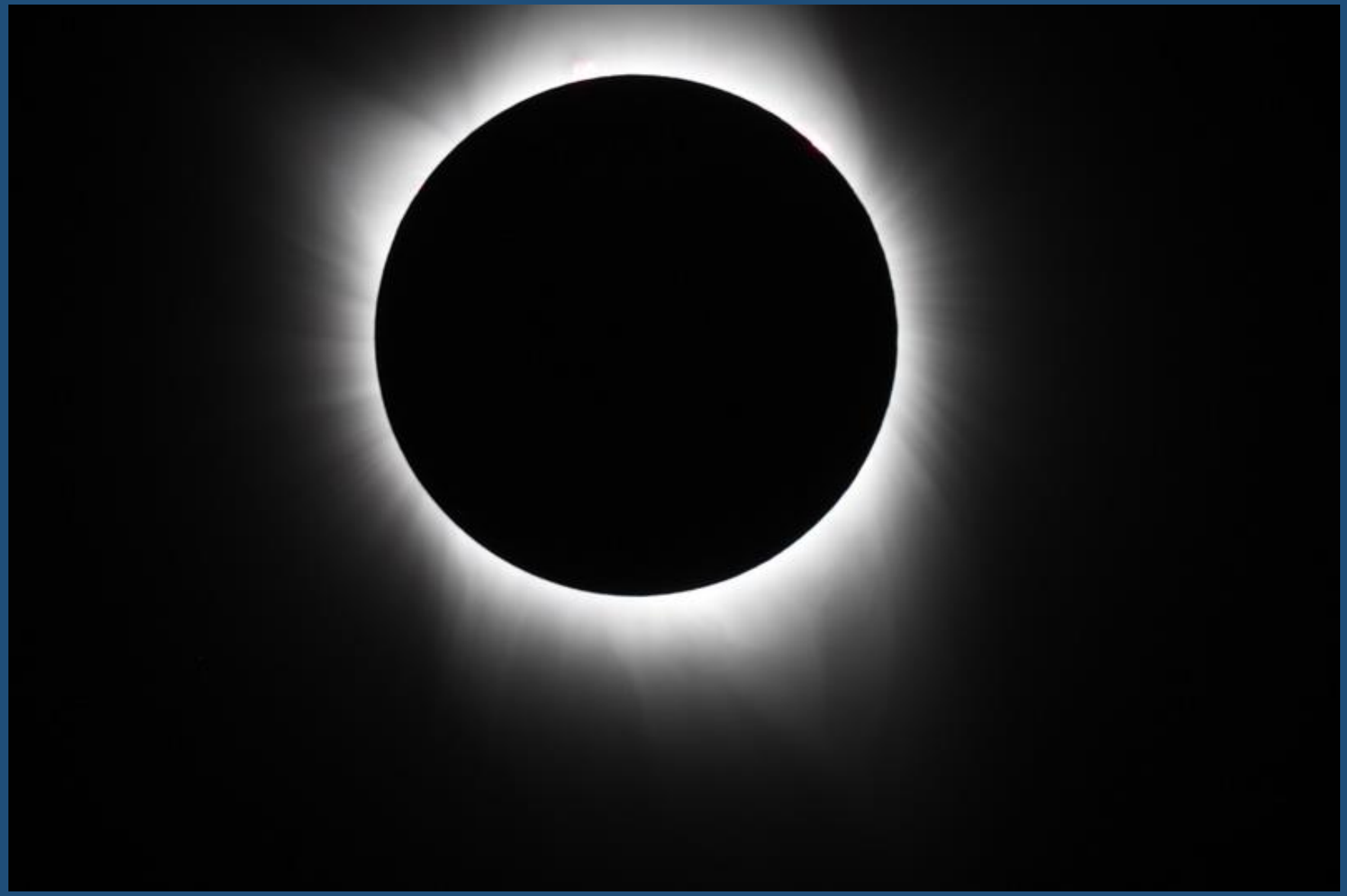


Jim Tomney and Steve Stewart, Earthshine

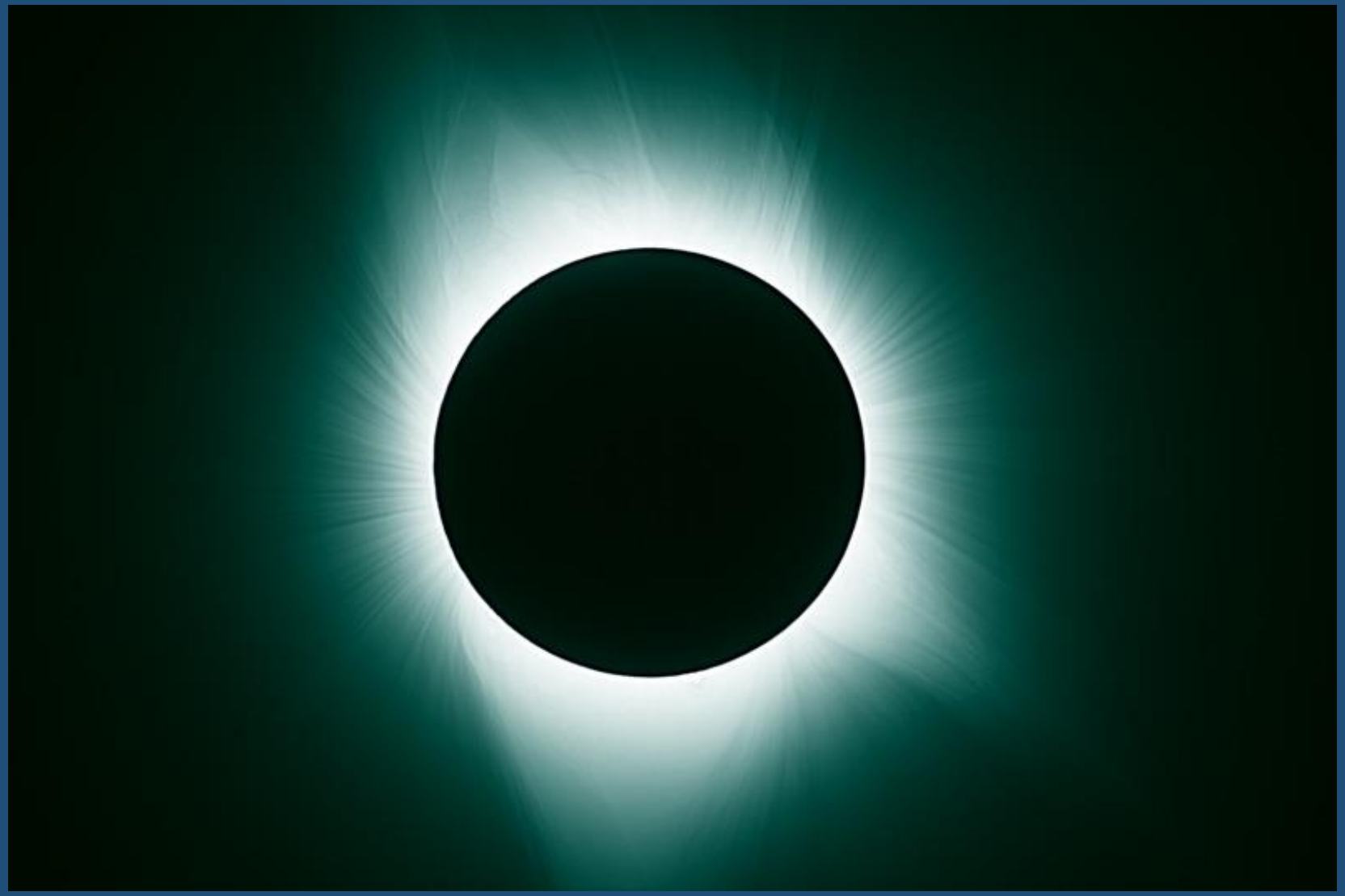
Jim Tomney and Steve Stewart, HDR Corona



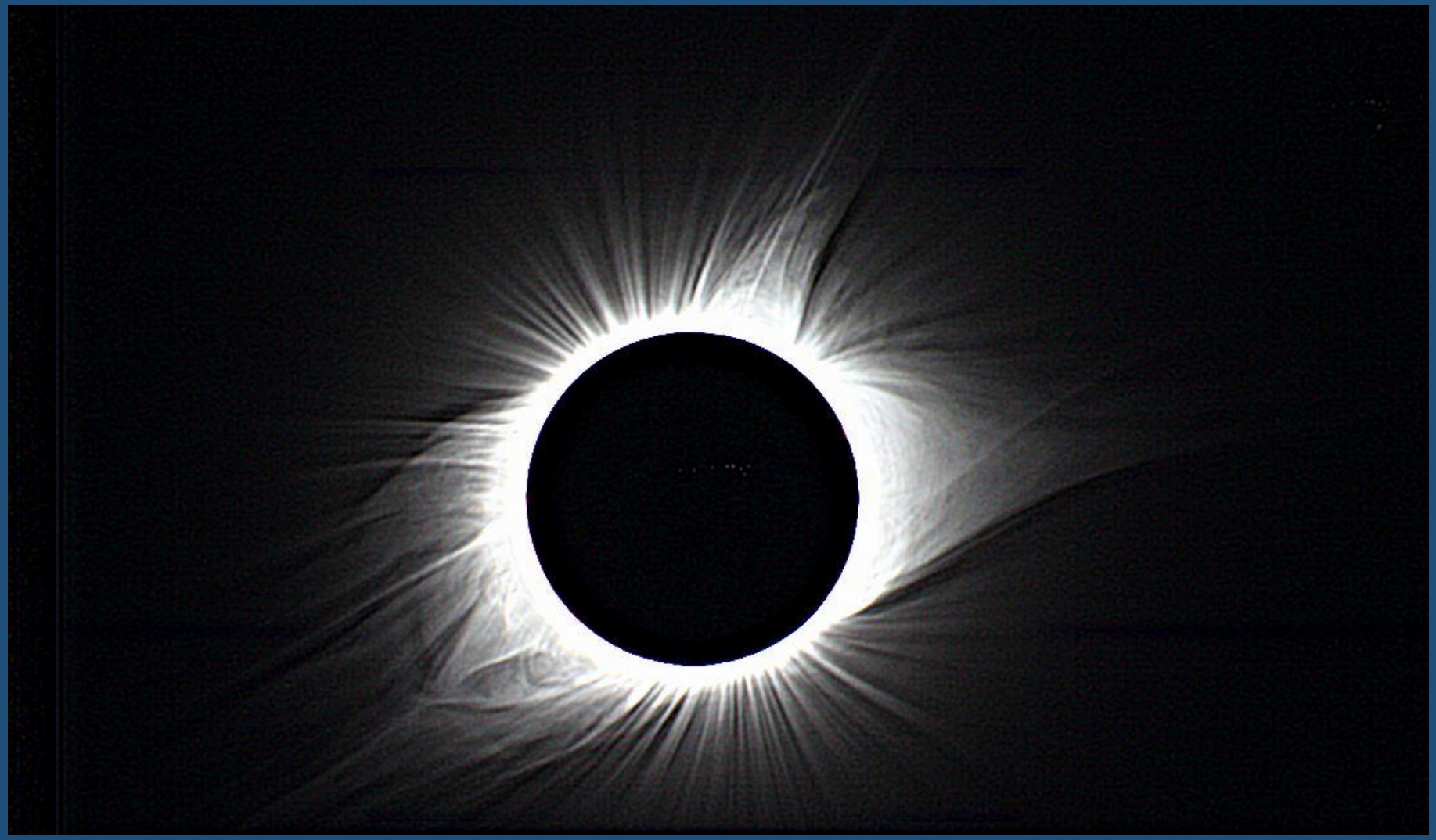
John L. Telford III, Totality



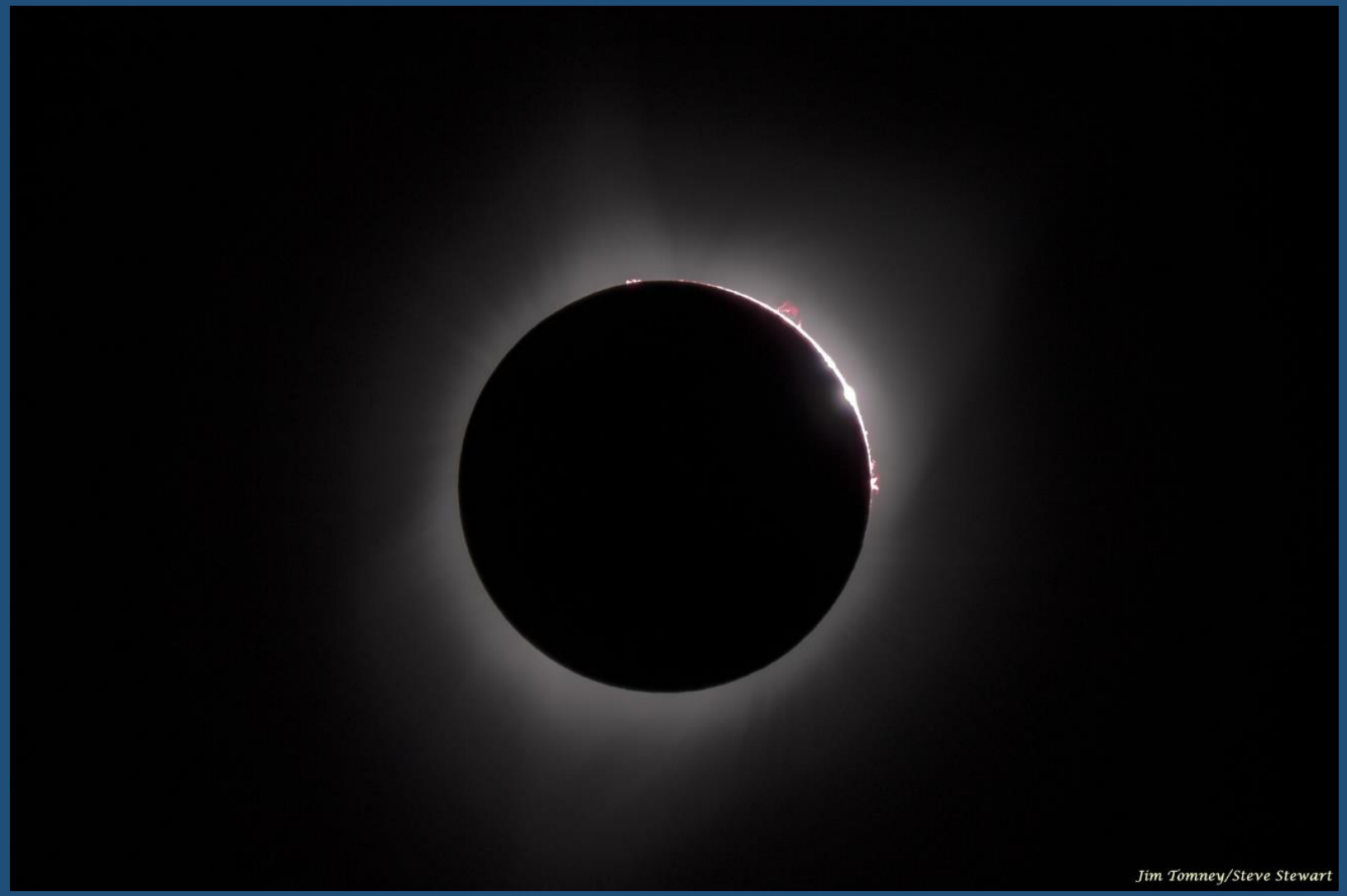
Wayne Baggett, Corona



Gene Handler, Totality



Ken Everhart, HDR Corona



Jim Tomney and Steve Stewart, Fiery Prominences

Wayne Baggett, Bailey’s Beads

Joe Bohannon, Eclipse Totality Diamond Ring

Contributed by Jim Johnson (in the dark vehicle just above the trees at top right of frame)
Overhead video of Jim’s location from unknown helicopter

Members/guests media sites…

Tom McShane

https://vestaconstructionwebsites.smugmug.com/Eclipse-2017/n-rJkRpk Password: Eclipse

Jay Berg

https://www.facebook.com/jay.berg.37/posts/10214385861900653

Jim Tomney

http://tomney.com/Eclipse2017/

Richard Orr

https://www.flickr.com/photos/dragonflyhunter/36396718910/in/dateposted/

Dale Ghent

https://www.facebook.com/dale.ghent/posts/10101901685269423

HAL Gallery

https://www.howardastro.org/halgal/main.php

HowardAstro@yahoogroups.com

https://groups.yahoo.com/neo/groups/howardastro/conversations/messages

National Perspective: Post Eclipse Headlines

Eclipse 2017: One Nation Under The Sun. NPR (August 27, 2017).

A camera store shows off gear wrecked by the solar eclipse. The Verge (September 3, 2017).

The 2017 Eclipse Taught Me Just How Bright the Sun Actually Is. HuffPost (September 2, 2017).

Eclipse 2017: Doctors surprised by few reports of eye injuries. OregonLive.com (August 25, 2017).

Charleston couple sues Amazon over eclipse glasses. USA TODAY (September 1, 2017).

Glendo, Wyoming asks for donations to cover eclipse expenses. The Denver Channel (August 29, 2017).

Did People Put Sunscreen on Their Eyes During the Solar Eclipse? snopes.com (September 5, 2017).

Kentucky Transportation Cabinet: Biggest Eclipse Surprise Was Outbound Traffic. WKMS (August 29, 2017).

Lessons learned

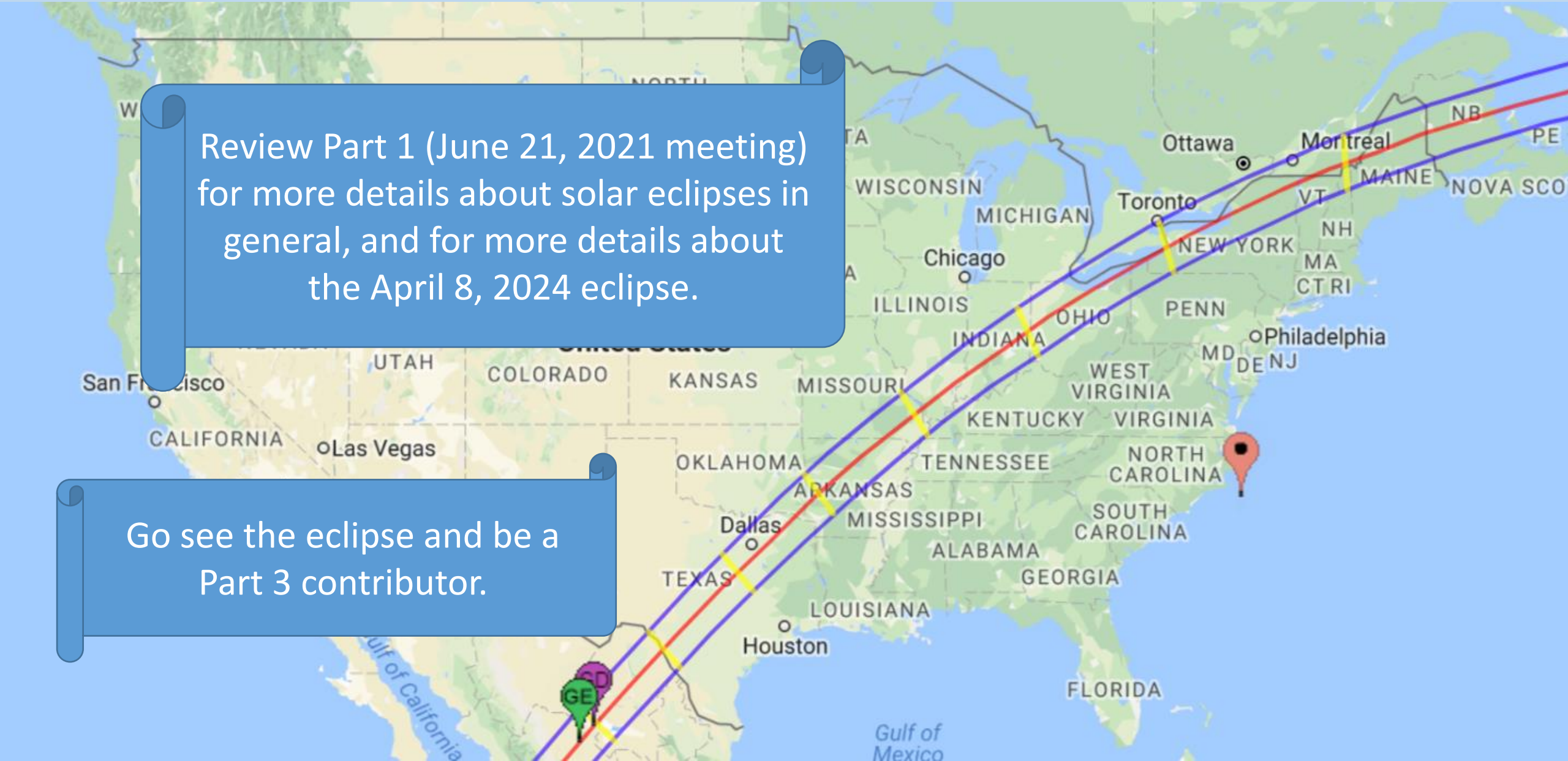
- Lodging
  - Reserve early
  - With an eye toward weather and possible cancellation hotel – reserve multiple sites?
  - Better to rent RV closer to viewing site than to drive it cross country
- Weather
  - Consider climate in site selection
  - Be flexible on eclipse day
  - Much to be observed if ultimately clouded out
- Traffic
  - Consider staying in place an extra day if lodging at your viewing site, or if you can camp for the night
- Eclipse Shades and Eye Safety
  - Be an-eye safety advocate
  - Recommend projection methods
  - Ask people how they plan to observe, and call out unsafe practices that might emerge

Lessons Learned

- Explore Outreach Opportunities
  - Look for organized events
  - Be prepared for ad hoc encounters

- Photography
  - Don’t put your viewing experience at risk. Leave it for the experts
  - But if you must:
    - Study
    - Plan
    - Practice
    - Rinse
    - Repeat
- Optics
  - View unfiltered at totality only
  - Do not be at the eyepiece as 3rd contact approaches

Next American Eclipse: April 8, 2024



Countdown to the next US eclipse

The 2024 eclipse is now just 21.7 synodic months away!!!

- April 8, 2024 -82 synodic months from now
- Moon will be one day past perigee, so very large apparent disk
- Enters US in Texas at 1831 UTC and Exits from Maine at 1931 UTC
- Path is over 100 miles wide across the US
- Duration is about 4:20 (Texas) to about 3:20 (Maine)
- Crosses path of 2017 eclipse near Carbondale, IL

The next total solar eclipse in the US happens in 2045.