

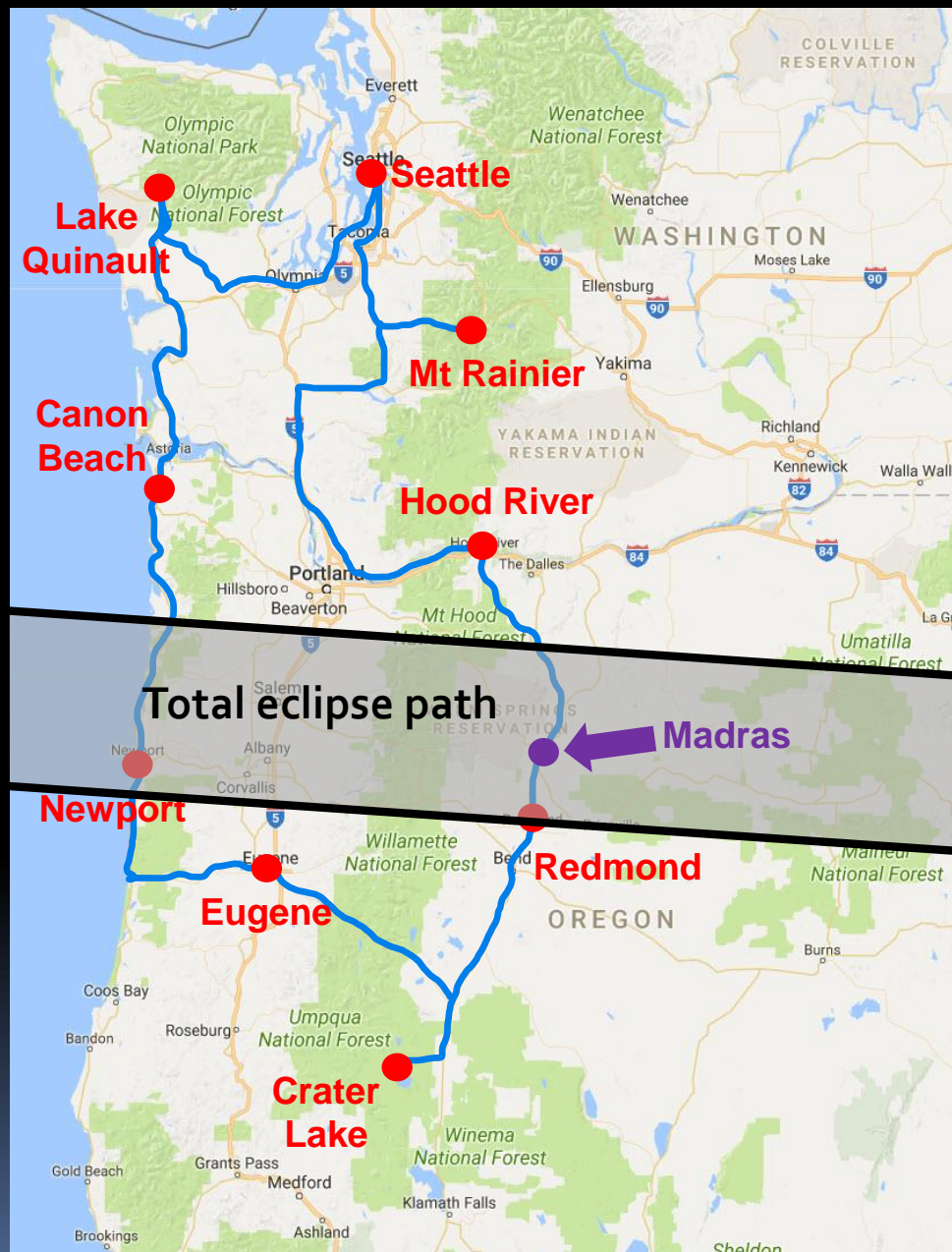
# Total Eclipse

Madras, Oregon, USA  
Aug 21, 2017

Peter North

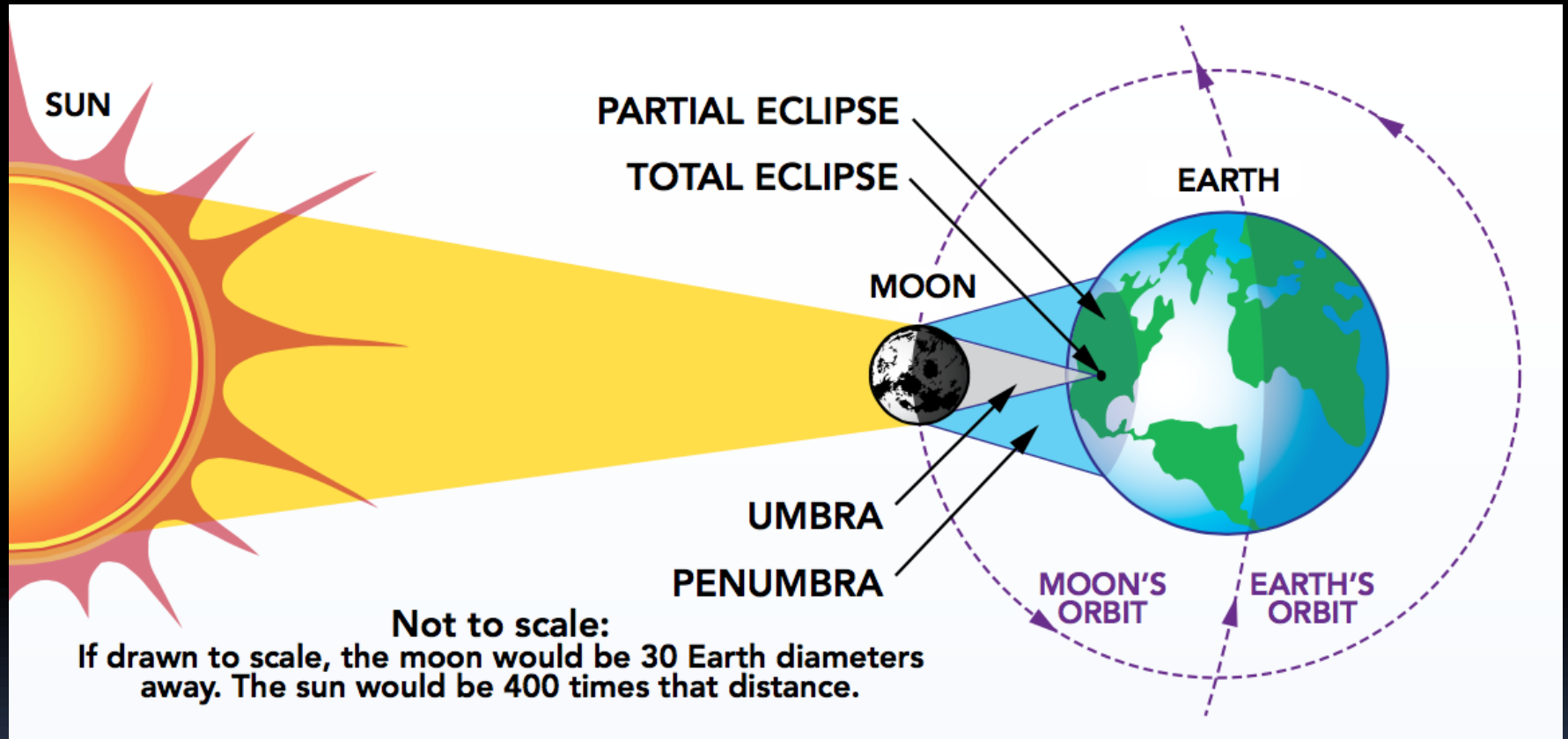
# Holiday Route

- Washington State / Oregon
  - 11-30th Aug
  - 19 Days
  - Fly to / from Seattle
  - Hire car
  - Clockwise route
  - 9 hotel stops
  - 1500 miles
- 
- Eclipse at Madras 21st Aug
  - On the centre-line of totality
  - Best chance of good visibility



Focus on  
the eclipse

# Science of Solar Eclipse – a reminder



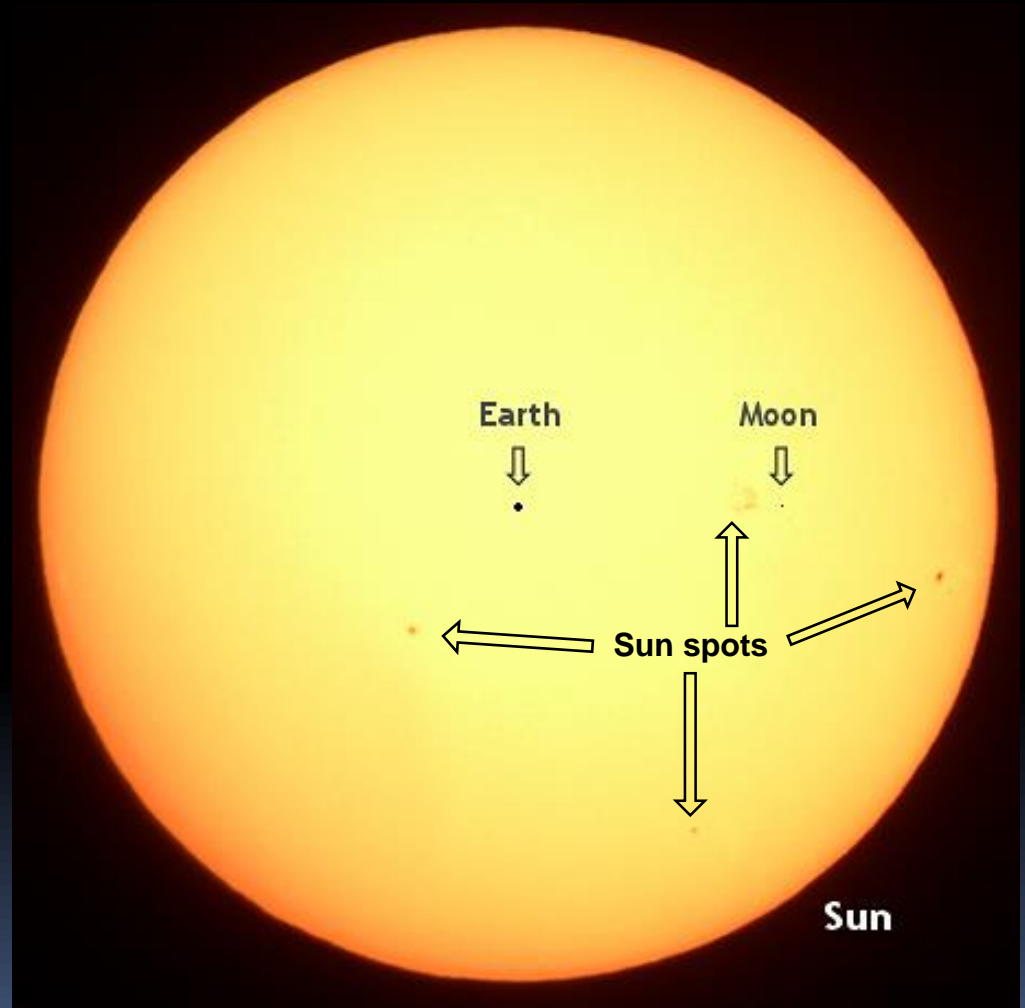
# Relative Diameters

Earth: 7,654 miles

Moon: 2,085 miles

**Sun: 835,200 miles**

You could fit 1,300,000  
Earths into the volume of  
the Sun!



# Relative Distances

Sun

835,200 miles wide  
(80 feet)

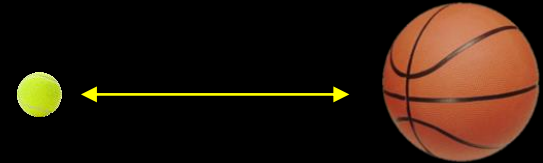


Moon

2,085 miles wide  
(2.5 inches)

Earth

7,654 miles wide  
(9 inches)



235,000 miles apart  
(24 feet)

92,900,000 miles apart  
(1.75 miles)

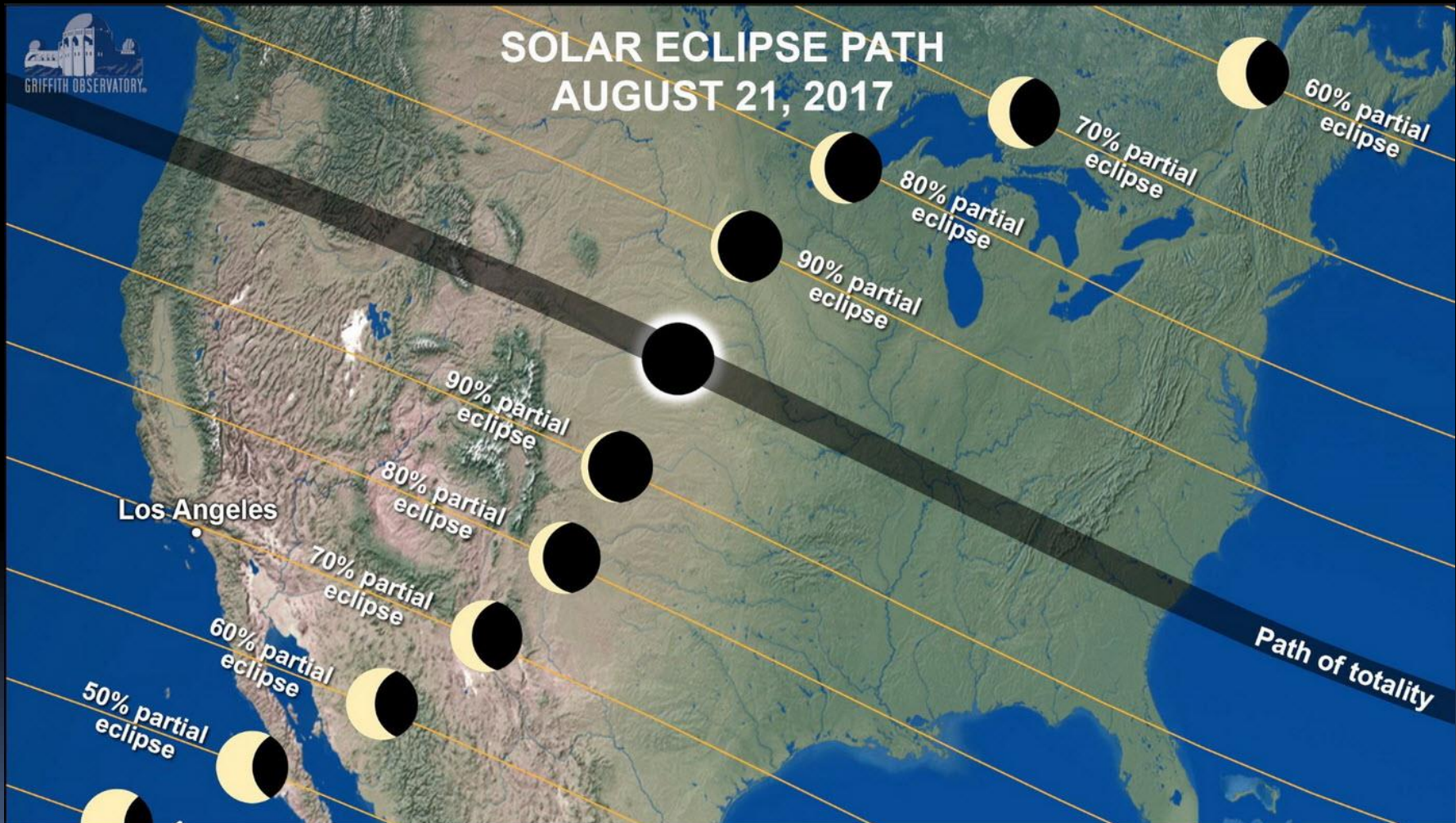


# Amazing Coincidence

- Coincidentally, the observed disc size of the moon and the sun in the sky are the same!
- This means that, during a solar eclipse, the moon's disc perfectly obscures the sun's disc
- This lucky coincidence allows the sun's corona to be seen very clearly during a total solar eclipse

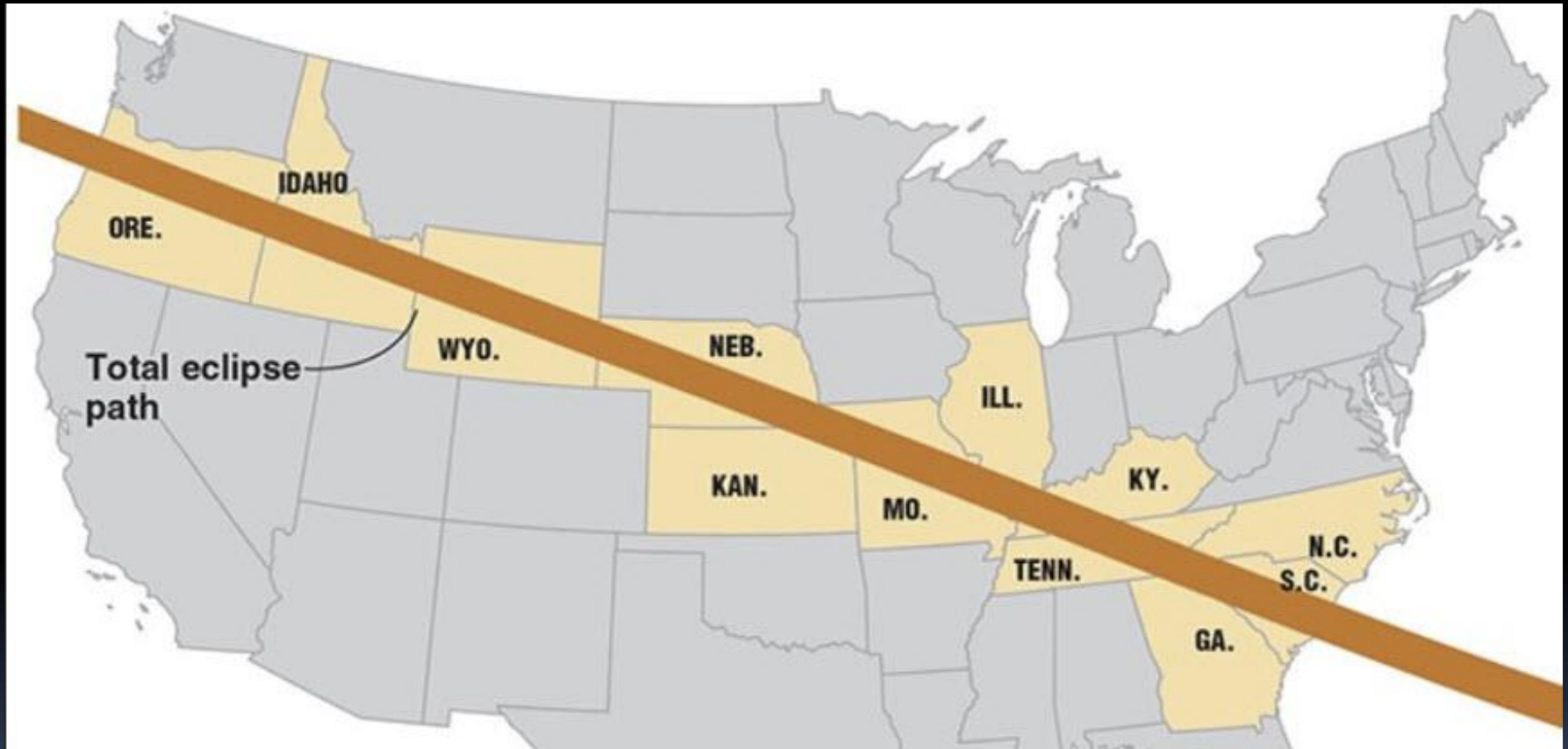


# Pathway Across North America

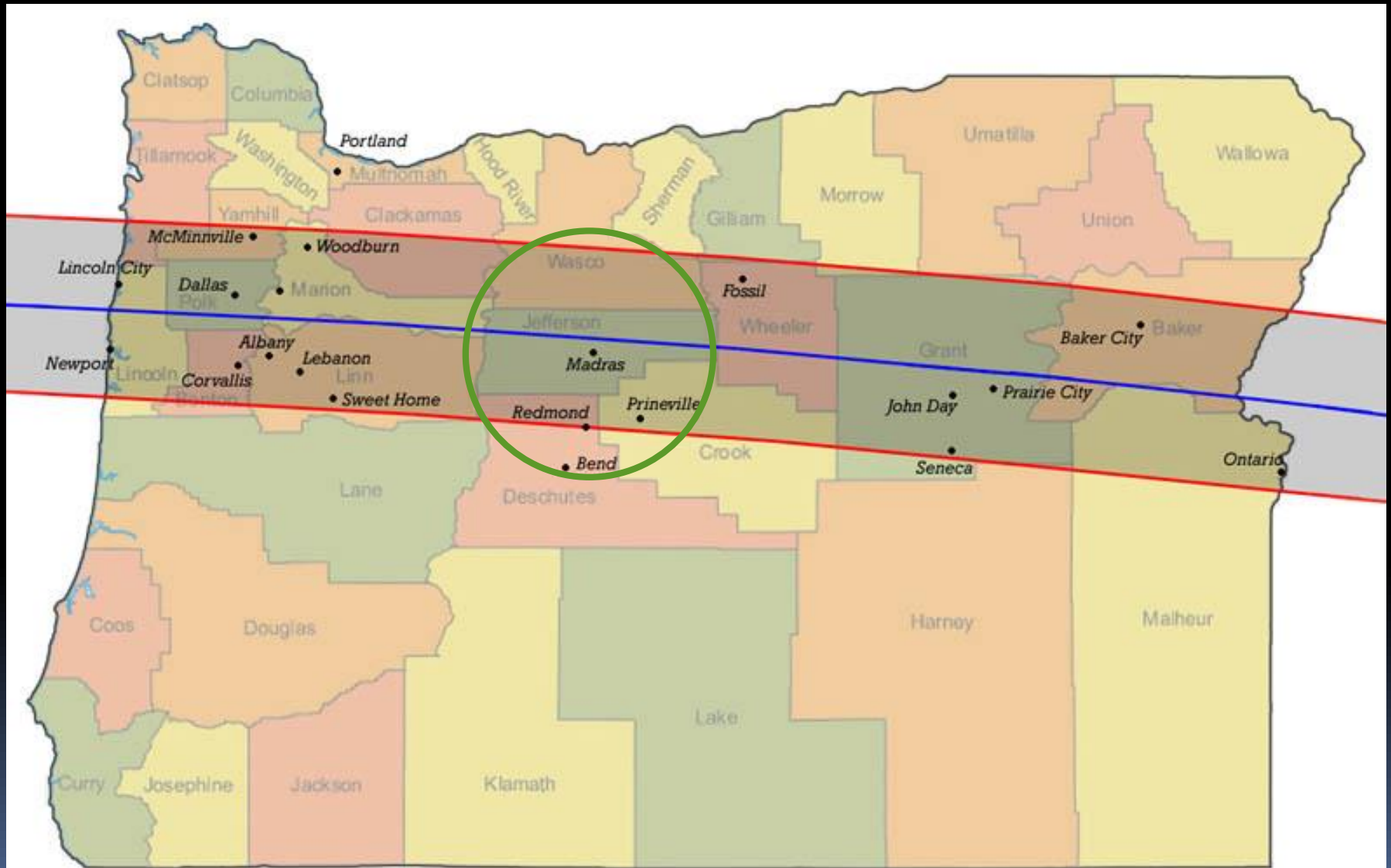




# Pathway Across 12 US States



# Pathway Across Oregon



# Madras, Oregon



- Sleepy, rural, agricultural town
- Population around 7,000
- 2,260 ft above sea-level
- Sits in a basin surrounded by hills & mountains
- Average of only 2 rain days in Aug
- Clear sky 80% of time in Aug
- Hosted >200,000 people to view eclipse

# Eclipse at Madras, Oregon – Timings

- 9:06 am: Partial eclipse begins
- 9:06 – 10:19 am: Moon slowly obscures sun (1h:13m)
- 10:19 – 10:21 am: Period of total eclipse (2 mins)
- 10:21 – 11:41 am: Moon slowly reveals sun (1h:20m)
- 11:41 am: Eclipse ends

# Eclipse Day – What I wanted to take away

- Video of approaching shadow from the west (2,000 mph)
- Good quality video of totality (about 2 mins) with audio of crowd reaction
- Good quality still photos of partial eclipse and corona during totality
- Some still photos / video of surroundings and people to try and capture 'The Vibe'



# Eclipse Day – Gear and preparation

- Canon 650D with Tamron 16-300mm Zoom – for video / stills of eclipse (150-400mm zoom too bulky / heavy)
- Lumix DMC TZ-70 Compact (24-720mm zoom)
- - for general video / stills
- Lightweight mini tripod for Canon (usual tripod too heavy for travel, height irrelevant for subject 92m miles away)
- 10 stop and 5 stop neutral density filters for Canon (usually used for slow shutter speeds in normal daylight)

# Day Before Eclipse – trial exposures of full sun using Canon SLR



- Actual size in frame
- Zoom lens at max 300mm
- Manual exposure / focus
- 1/2,000 sec @ f16
- ISO 200
- 10 stop + 5 stop neutral density filter
- Equiv to 1/64,000,000 sec @ f16, ISO 200



- Crop of same frame
- Note sun spots

# Eclipse Day – Photo Strategy

- Set-up Canon SLR on mini-tripod using settings from previous day (full sun)
- Use Canon SLR to take regular stills (not lengthy video) of moon crossing the sun (1h:13m)
- Just before totality, switch to video on SLR to capture corona (2 min) and audio of crowd
- During video recording (2 min) take regular stills of corona during totality (this can be done on most DSLR while taking continuous video)
- Use Lumix compact (hand-held) to record video of approaching shadow, surroundings and crowd reaction

Still Photos  
leading up to and  
during the eclipse  
(All record shots)

# Eclipse fever all around





Regular Big Mac meal & solar glasses please



Pre-booked pitch in field - \$25 (open 24h before)





6:26am: sunrise looking east



6:26am: Mt Jefferson 33miles to the West  
(Shadow will approach from west at 2,000mph taking 1min)





7:03am: It has to be done!





7:22am: Setting up the cameras & telescopes





7:22am: Setting up the cameras & telescopes





7:27am: Heavy media presence on land / in air



7:28am: Some high cloud but mainly OK





8:00am: Time for some breakfast





8:36am: Make yourself comfortable



8:46am: Having a lie-in





9:00 am: Camera set up, 1h 20min to totality





9:00 am: Camera set up, 1h 20min to totality





9:00 am: Camera set up, 1h 20min to totality





# Pre-Eclipse – 9:00 am ( Eclipse starts in 6min)

- Cropped frame
- Zoom lens at max 300mm
- Manual exposure / focus
- 1/500 sec (cf 1/2,000) @ f16
- ISO 200
- 10 stop + 5 stop neutral density filter



Start of Eclipse – 9:15am (Totality in 64 min)



# Partial Eclipse – 9:38am (Totality in 41 min)



No perceptible change in temp or light

Partial Eclipse – 9:57am (Totality in 22 min)



Getting noticeably cooler but not darker



Partial Eclipse – 10:11am (Totality in 8 min)



Getting very cool and slightly darker

Partial Eclipse – 10:18am (Totality in 1 min)



Getting much darker very quickly

# Totality – 10:19am, corona visible

- Cropped frame
- Zoom lens at max 300mm
- Manual exposure / focus
- 1 / 30<sup>th</sup> (cf 1/500) @ f16
- ISO 200
- No 15x neutral density filters
- NB: Exposure difference of 19 stops relative to partial eclipse settings



Cold and very similar to moonlight at full moon

Totality— 10:20am, solar flares visible





Totality – 10:21am, Baily's beads



Totality – 10:22am, diamond ring



Total Eclipse End – 10:23am, totality over





# Post Total Eclipse – Moon slowly reveals sun

(all with 15 stop ND filter)



Totality end + 1min



+ 8min



+ 27min



+ 43min



+ 1h 6min



+ 1h 30min

Then Back to Hotel – 8h to travel 20 miles!



# Future Eclipses



# Next Total Eclipse in USA – 2024

**April 8, 2024, total solar eclipse**

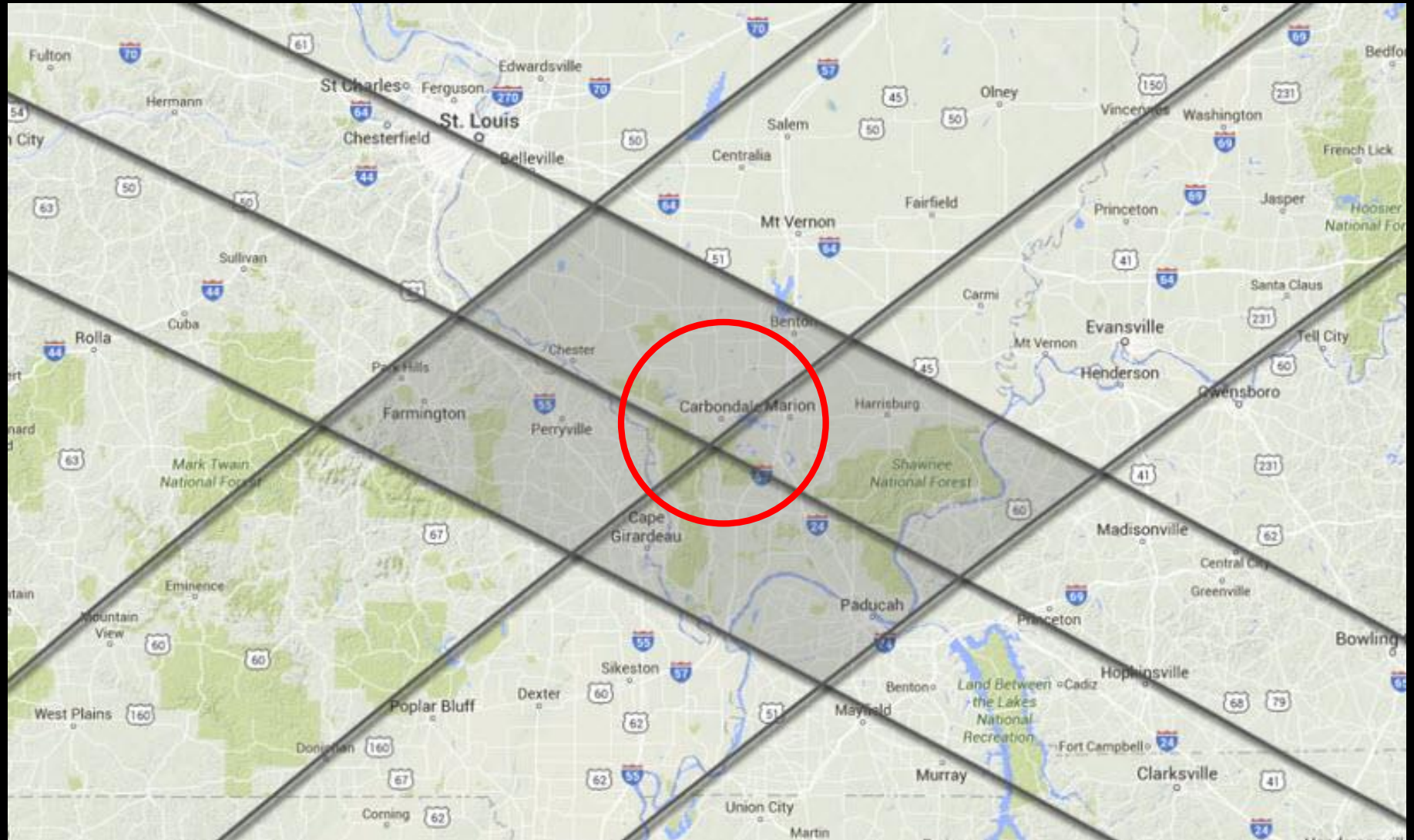


# Path of Next Total Eclipse in USA – 2024





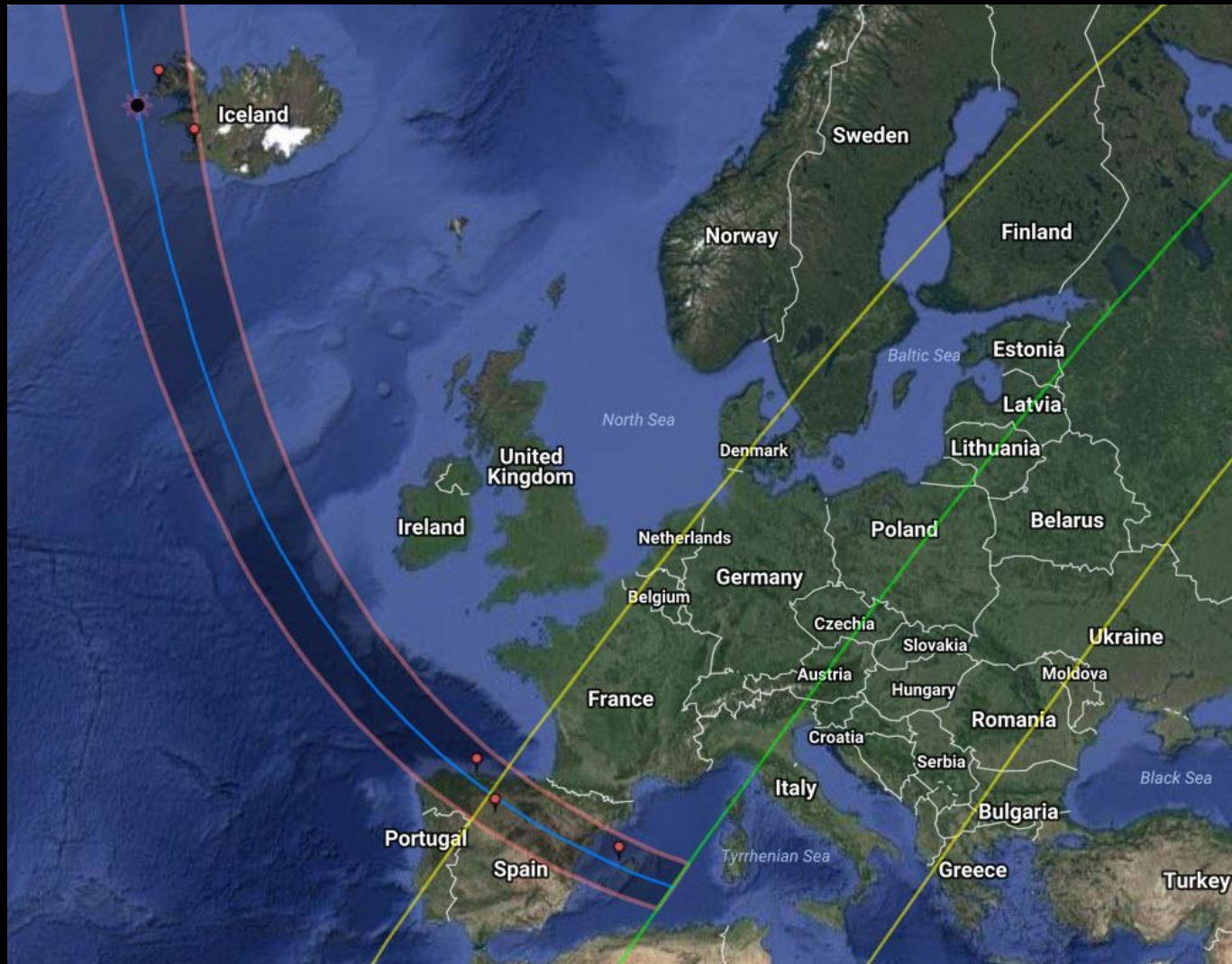
# Two eclipses in 7 years – Carbondale Illinois





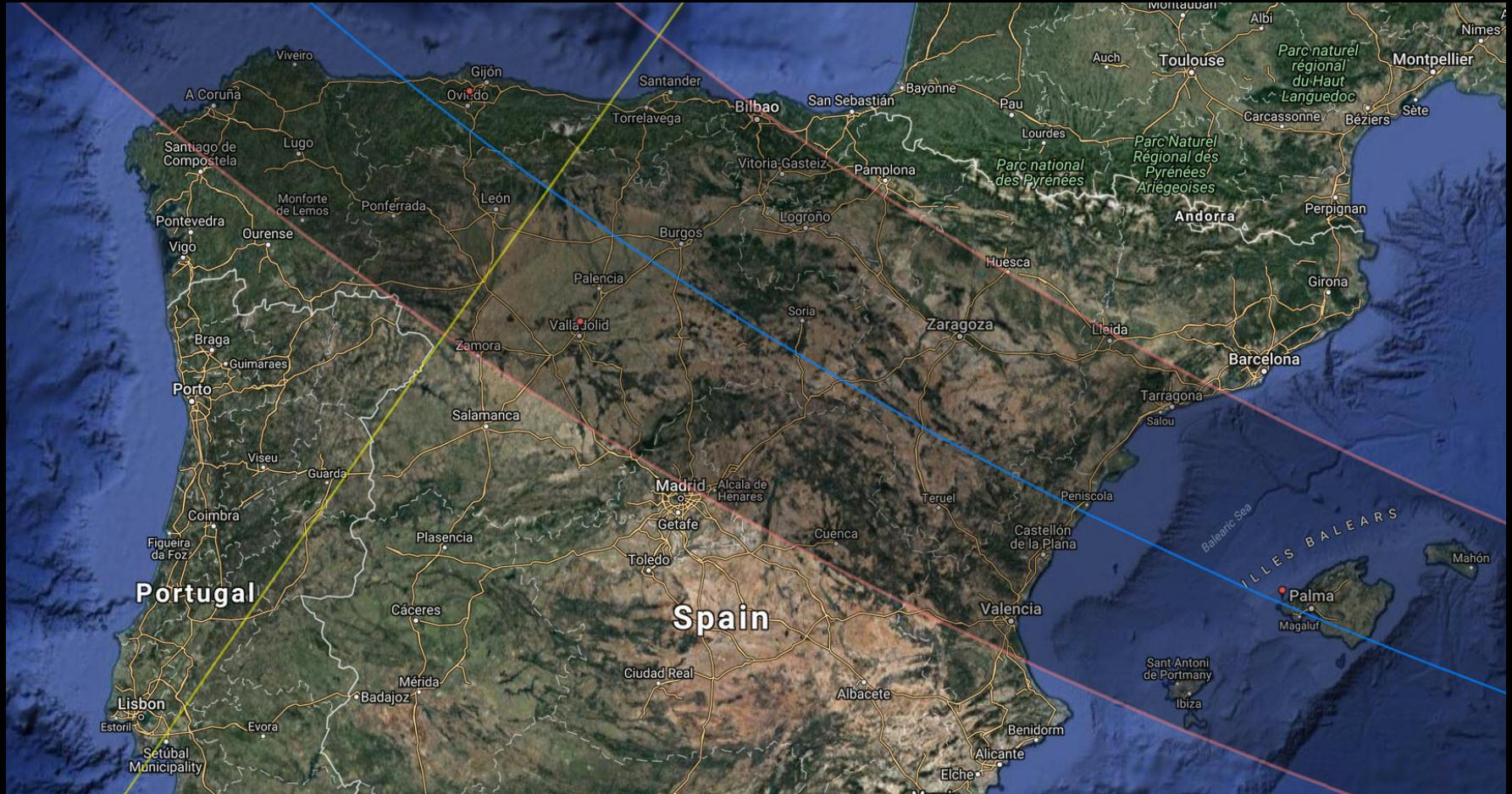
# Next Total Eclipse in Europe: Spain (& Iceland)

– 12 Aug, 2026

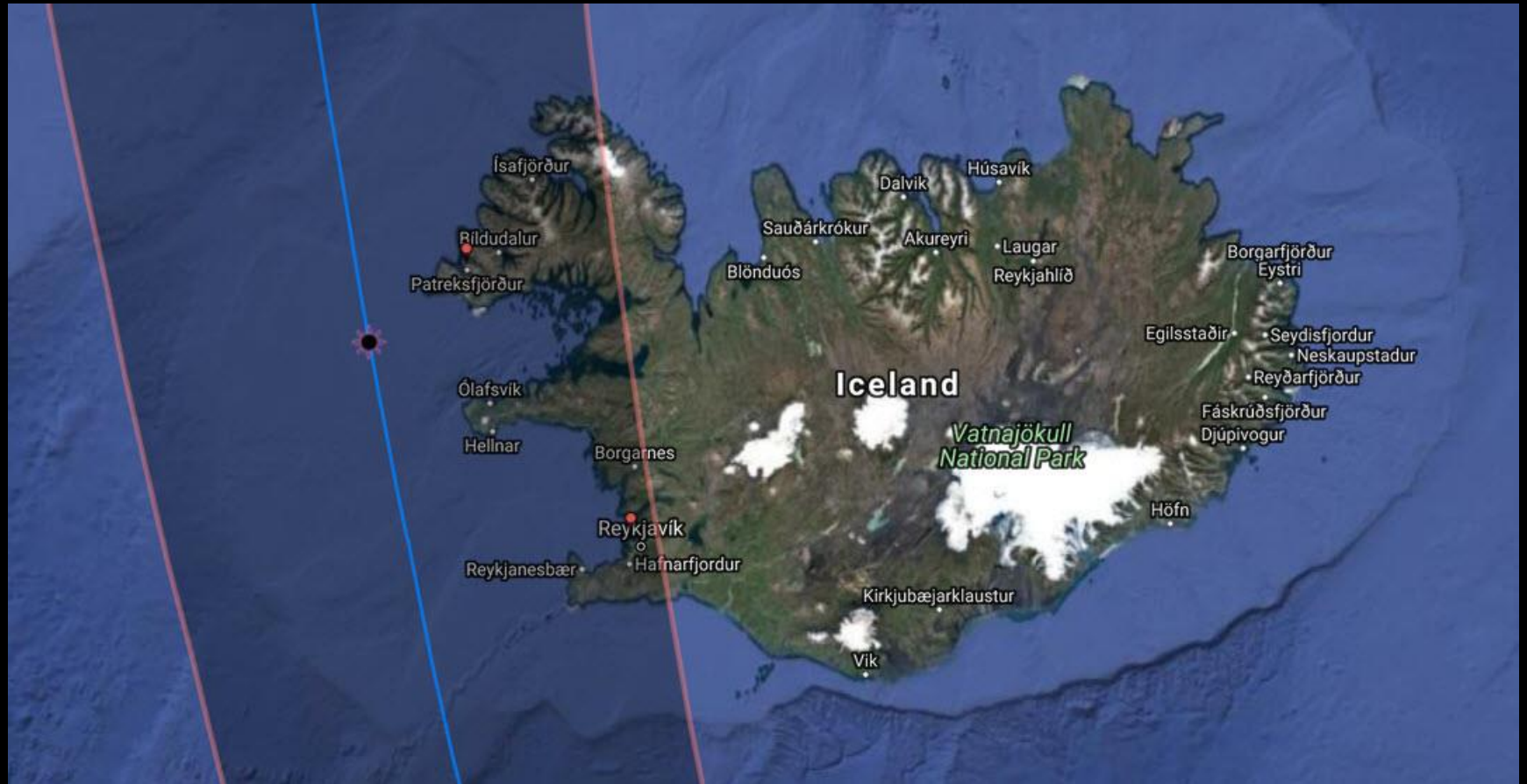




# Next Total Eclipse in Europe: Spain – 12 Aug, 2026



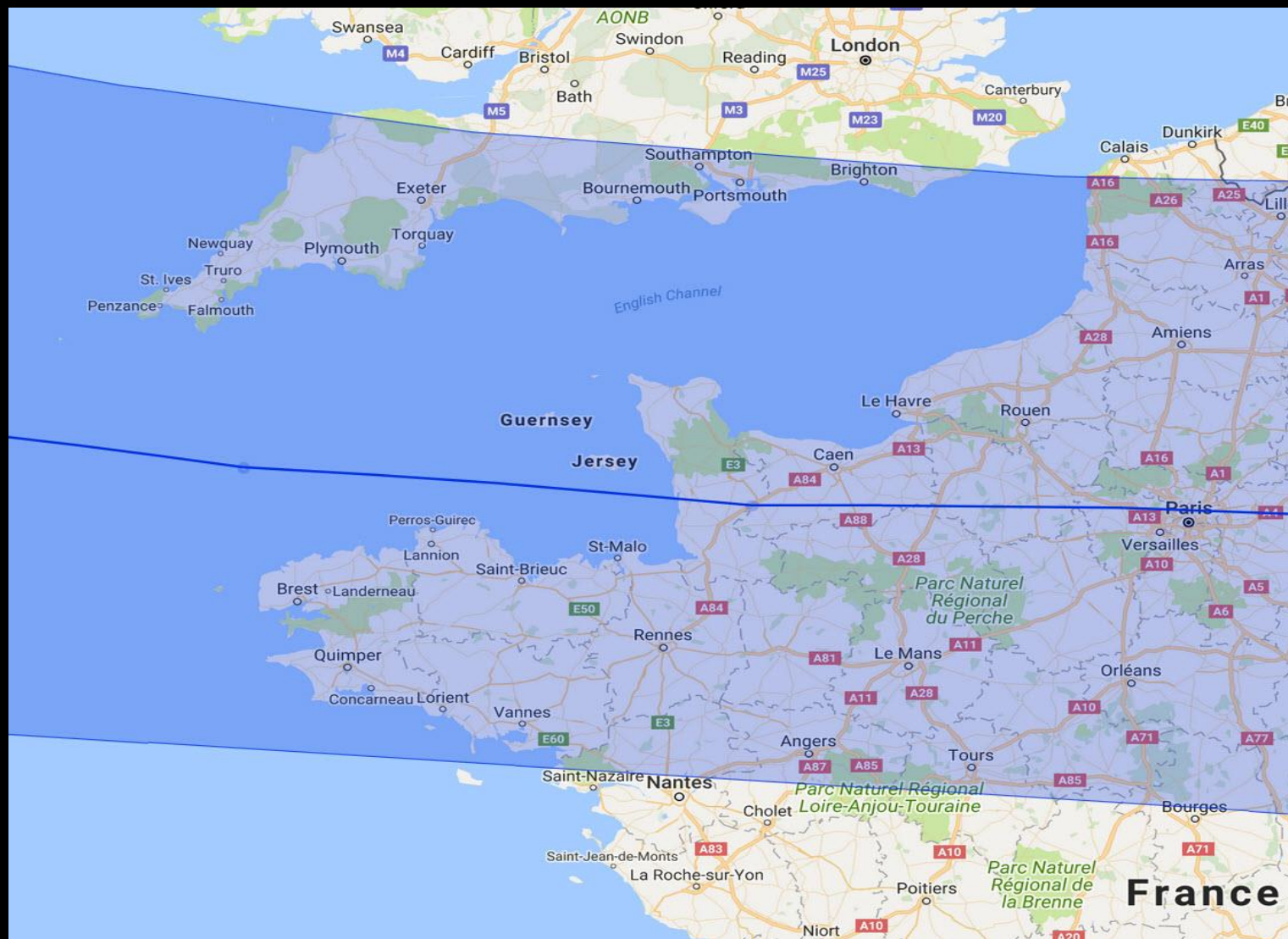
# Total Eclipse in Iceland – 12 Aug, 2026





Next Total Eclipse  
in UK ?

# Next Total Eclipse in UK – 2090 (in 73 years)



# VIDEO

3.5min

Edited together on my PC from video and still photos

Includes some aircraft noise (sounds like wind)

Watch out for 2,000mph shadow from west 1min before totality

Someone plays Pink Floyd at totality!

Time-lapse sequence at end of video