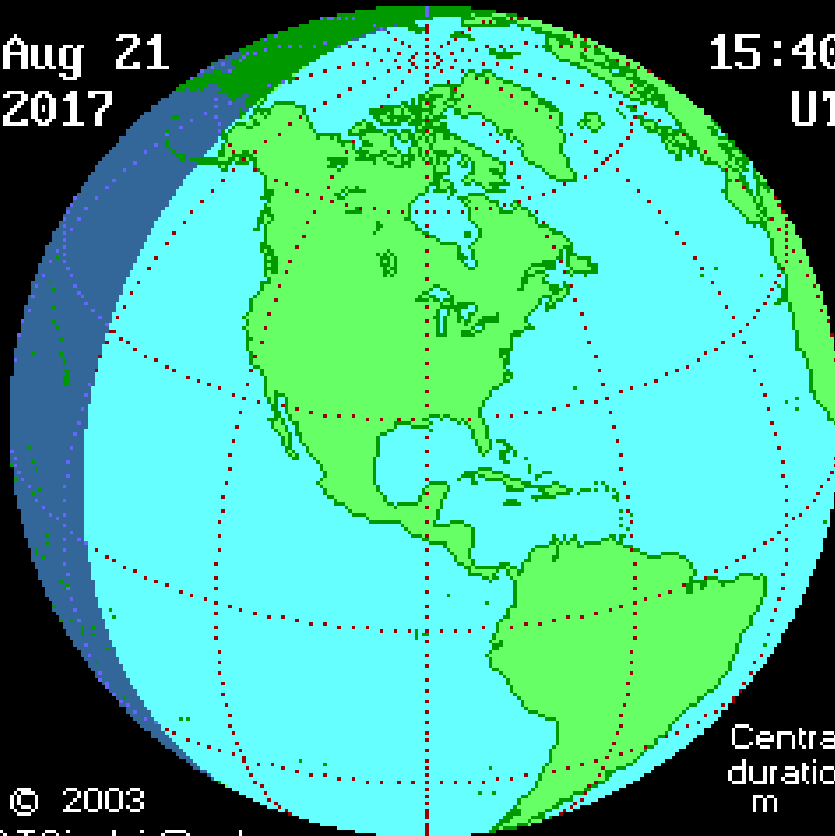


What to Expect during the August 21, 2017 Eclipse

Aug 21
2017

15:40
UT



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ATSinclair@aol.com

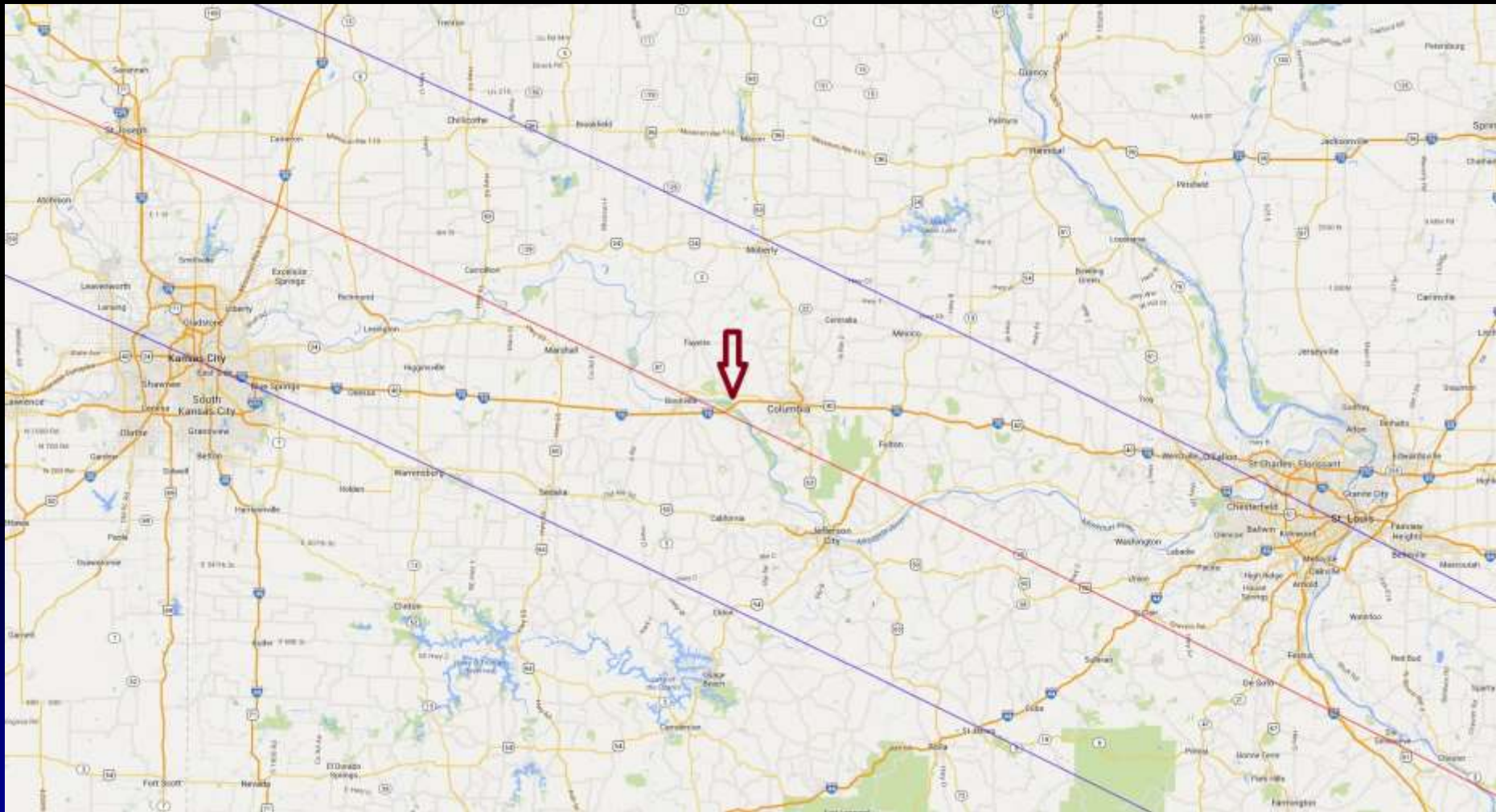
Central
duration
m s

Presentation Copyright © 2005-2017
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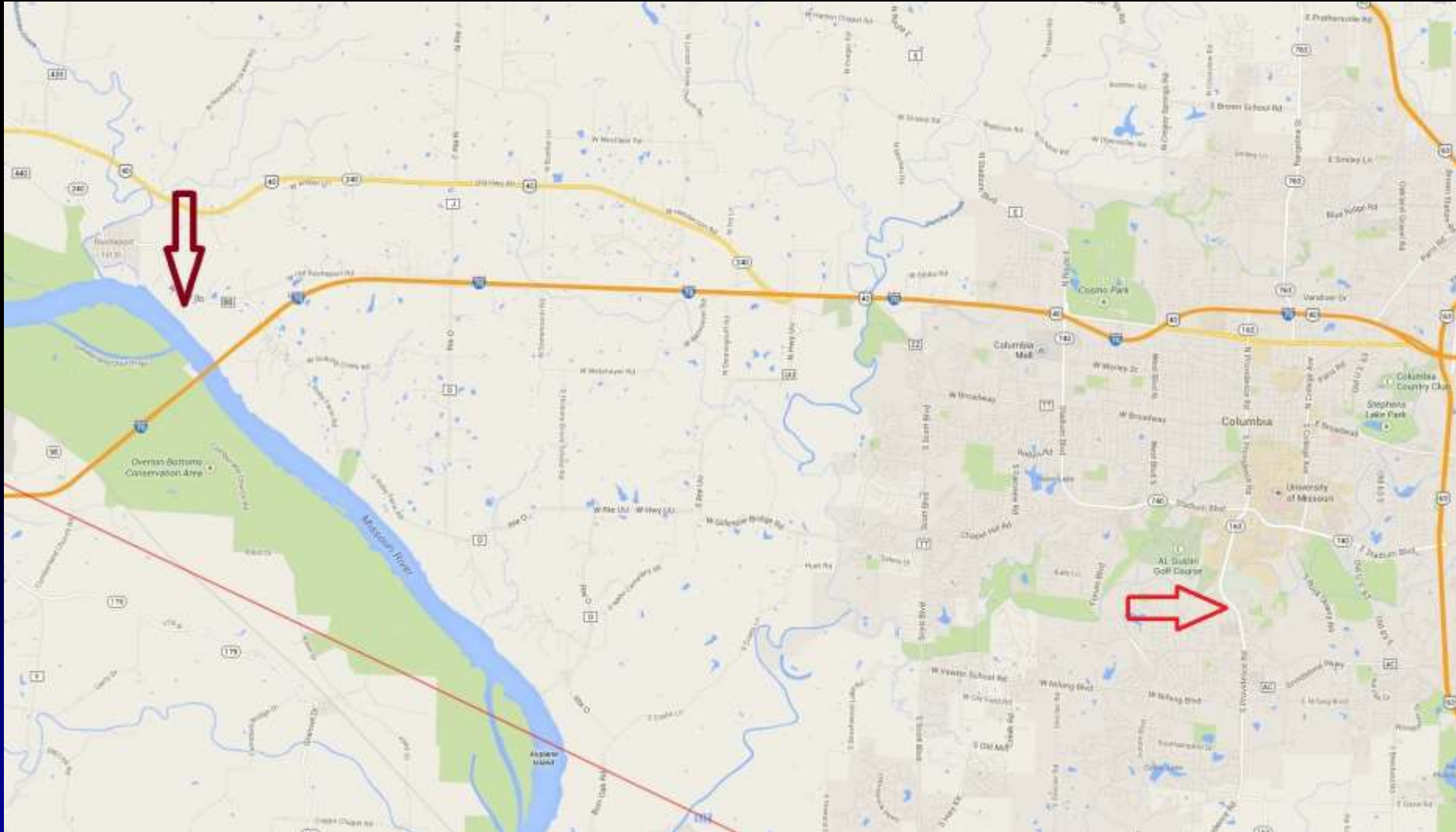
Last updated 07/4/2017

http://www.eclipse2017.org/2017/2017_anim.htm

Eclipse Path through Missouri



Columbia, MO & Eclipse Site



Stoney Creek Inn

Columbia, MO



88% Positive

Ranked #2 of 36 hotels in Columbia

223 Reviews

4.5 out of 5 rating

Certificate of Excellence 2014



Les Bourgeois Vineyards

Rocheport, MO



Ranked #2 of 4 restaurants in
Rocheport (114 Reviews)

4 out of 5 rating

Certificate of Excellence 2014

Local Circumstances

38° 58' 09.3" N <-> 38.6994° 2m39.0s (total eclipse)
92° 32' 59.9" W <-> -92.5499° Date: 08/21/2017 UT

Umbral depth : 92.21% Obscuration : 100.00%
Magnitude at mid eclipse : 1.014 Moon/Sun size ratio : 1.03054

Event	Time (UT)	Alt	Azi
Start of partial eclipse (C1):	16:45:12.3	+56.6°	138.2°
Start of total eclipse (C2):	18:11:50.2	+62.9°	179.3°
Mid eclipse:	18:13:09.7	+62.9°	180.0°
End of total eclipse (C3):	18:14:29.2	+62.9°	180.7°
End of partial eclipse (C4):	19:39:47.1	+56.8°	221.2°

Local time is UT -5 hours (C1 = 11:45:12.3, C2 = 13:11:50.2, Mid = 13:13:09.7, C3 = 13:14:29.2, C4 = 14:39:47.1).

Calculated using
<http://eclipse.gsfc.nasa.gov/SEsearch/SEsearchmap.php?Ecl=20170821>

First Contact

- Moon begins to move over Sun from West
- Starts at ~11:45:12 AM
- Must observe sun with filter!
- Good time to check and adjust mount tracking and alignment
- Watch for sunspots



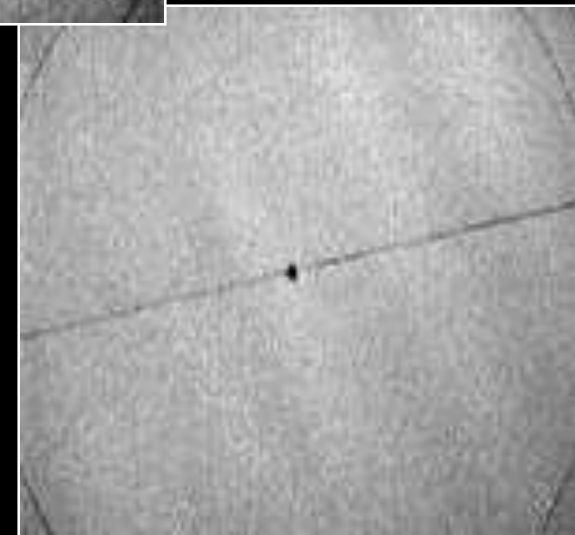
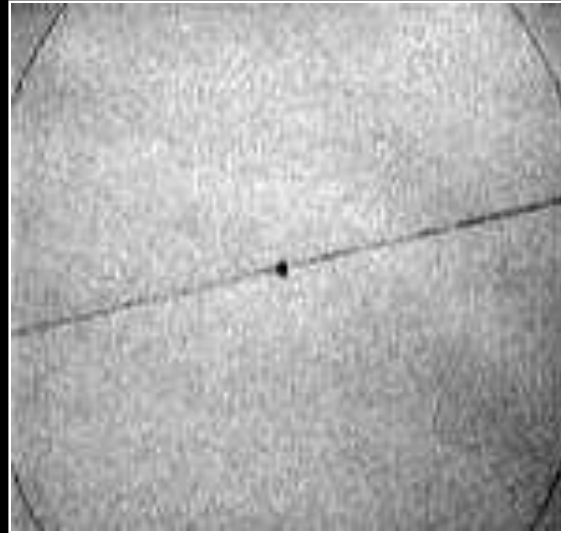
First Contact

- Crescent images of Sun
 - Natural pin-holes such as leaves on trees
 - Pin-holes in cardboard
- Watch sky and environment
 - Gradually darkens
 - Temperature drops



~1 min Before Second Contact

- Shadow bands
 - Are faint ripples of grayish light that wiggle briskly across landscape
 - Similar to ripples seen at bottom of pools
 - Caused by atmospheric refraction
 - Occur about a minute before Second Contact
 - Spread white sheet on ground to see
 - Usually not seen unless sky is crystal clear



~Minute Before Second Contact



6/21/2001
Zambia
(Mario Motta)

- Onrushing shadow from west
 - ~Minute before Second Contact
 - Watch color and general appearance



30 Seconds Before Second Contact

- Baily's Beads
(~1:11:20 PM)
 - Starts about 30 secs before Second Contact
 - Last bit of sunlight shines through the moon's jagged edge
- Filters off of cameras and telescopes!

Last Seconds Before Second Contact

- Diamond Ring
 - Last “baily’s bead”
 - Lasts only a few seconds before Moon completely covers the Sun

Second Contact

- Start of TOTALITY!
- Moon *completely* covers the Sun
- FILTERS OFF - Safe to directly view totality
- At site:
 - ~11:11:50 AM
 - Lasts for 2 minutes and 39 seconds
 - Sun/Moon
 - altitude of $\sim 62.9^\circ$
 - azimuth of $\sim 180^\circ$



Totality

- The Corona

- What everyone is waiting for!
- Best viewed with binoculars
- Look for streamers and how far out they go (Sun/Moon are $\sim 1/2^\circ$)
- Each eclipse's corona is unique - study this one carefully
- Look for polar brushes!





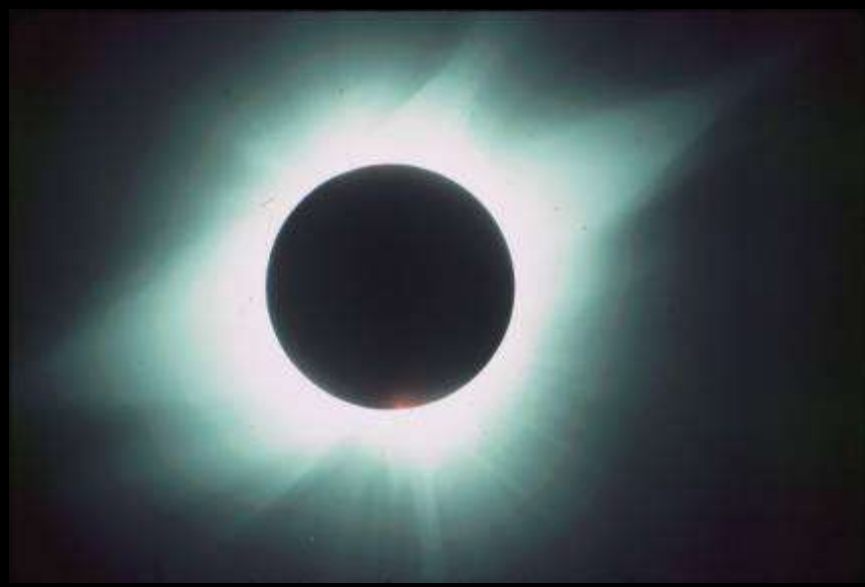
6/21/2001 – Zambia (Mario Motta)



Bernie Volz

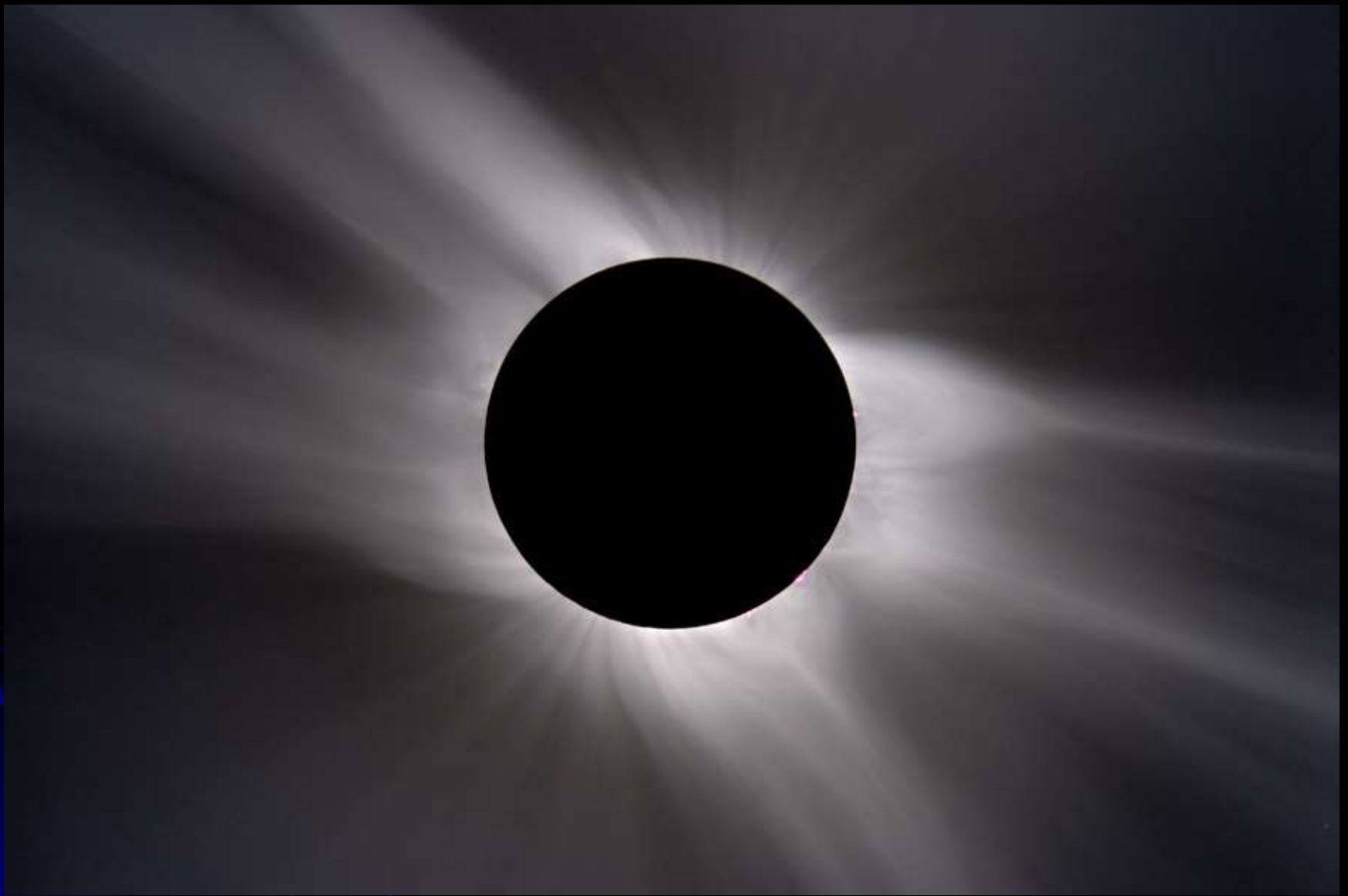
Baby Beach, Aruba
2/26/1998





La Paz, Mexico
7/11/1991





Bert Halstead, March 29th, 2006, Egypt, Composite

Totality

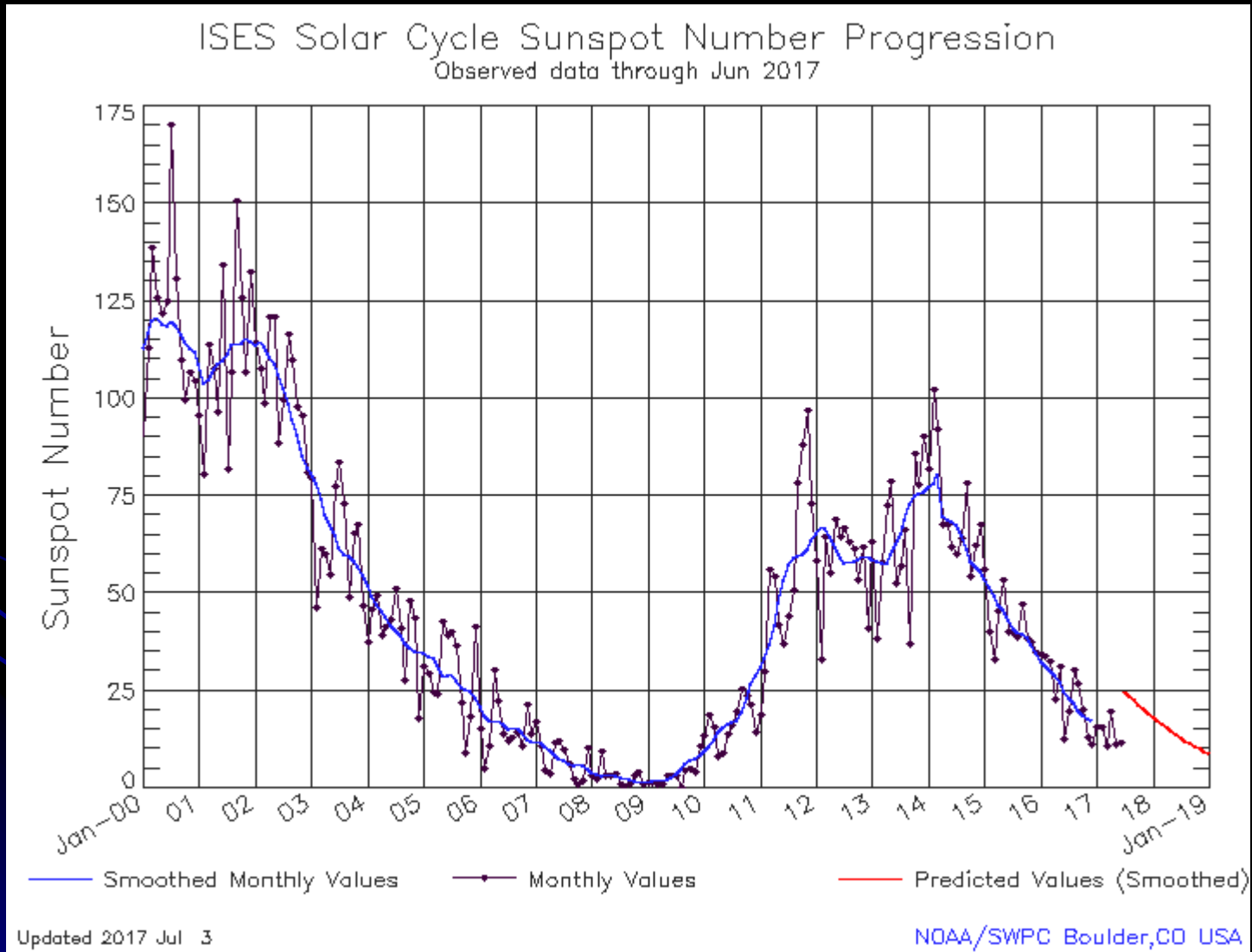
- Prominences

- Red areas near solar (lunar) disk
- May have none or may have several
 - Depends on solar activity



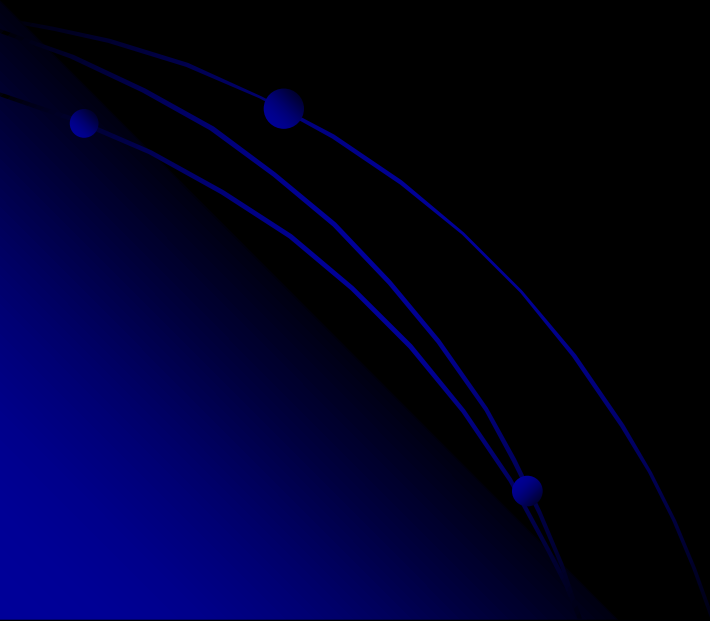
08/11/1999 - Hungary

Solar Cycle – Past Solar Max



Totality

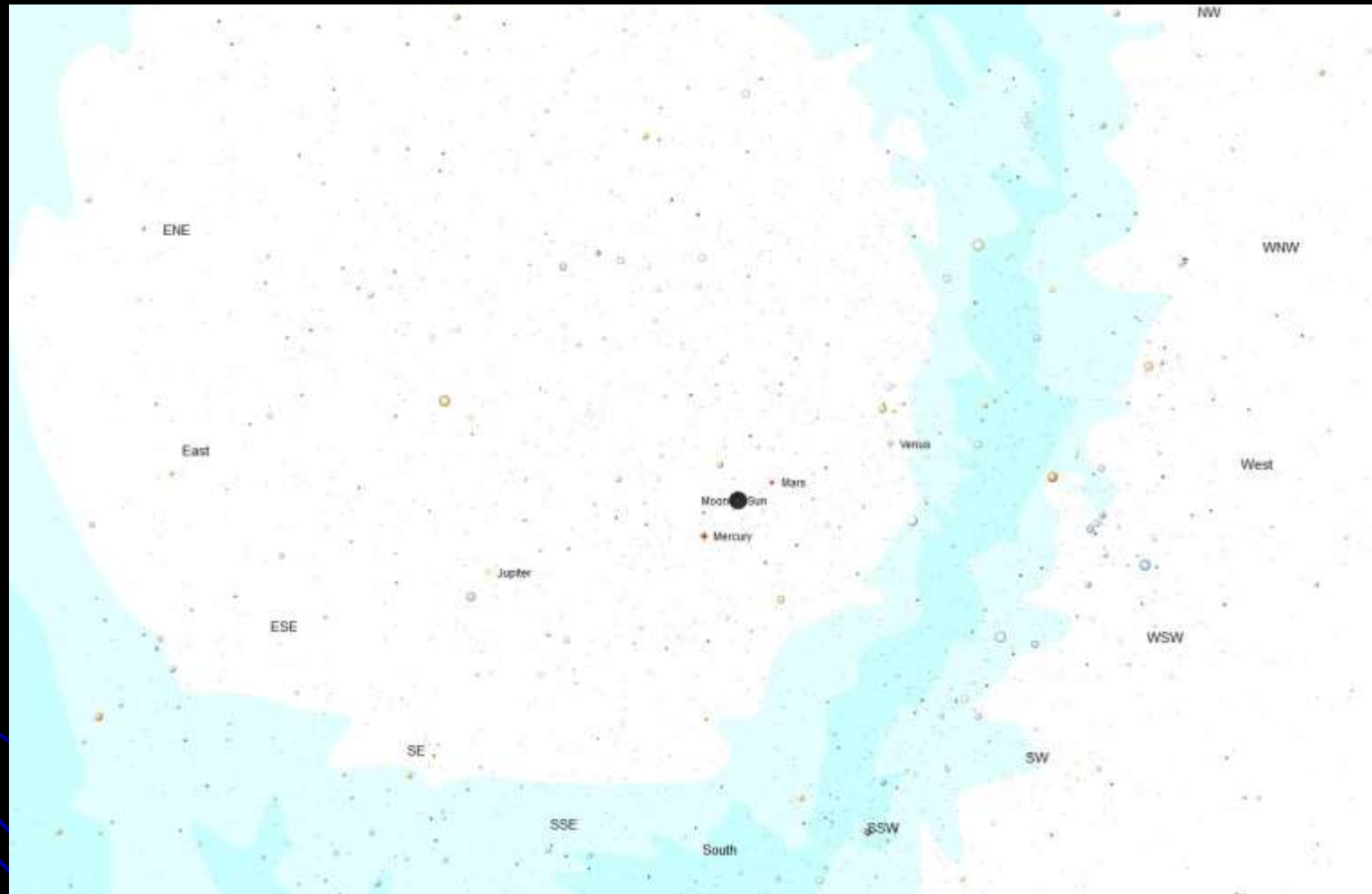
- Look around at the twilight sky
 - Planets
 - Stars
 - Constellations



Planisphere Projection of Sky during Totality

Using The Sky X

To use, hold over
your head with
directions oriented
properly.



Totality

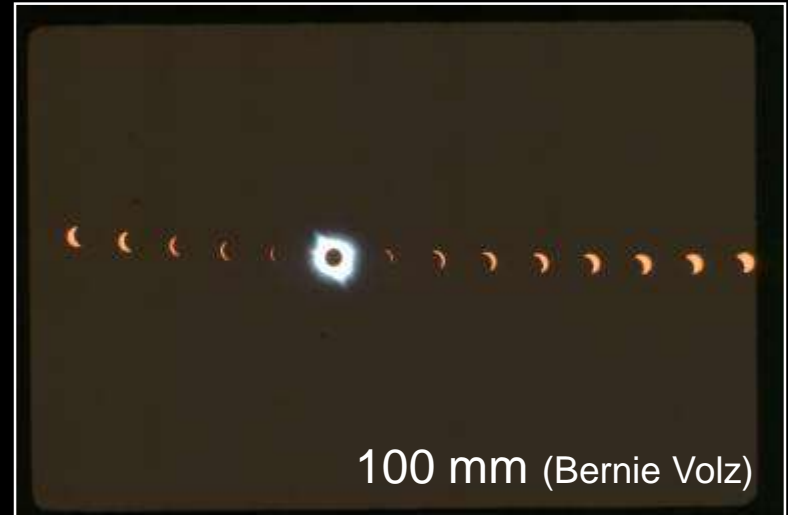
- Take in the environment
 - Darkness of eclipse
 - Animal reactions
 - Temperature drop
 - Wind speed



Totality

- Don't forget to take your photographs
 - Don't need "fast" film - ISO 100 is fine
 - Bracket, Bracket, Bracket!
 - For Mercury - f/8, ISO 100 = $\sim 1/125$
 - For Venus - f/8, ISO 100 = $\sim 1/500$
- Don't forget to LOOK
- You only have 2 minutes and 39 seconds!

Field of View and Sun's Image Size vs Focal Length (35mm film)



Field of View and Sun's Image Size vs Focal Length (35mm film)

<u>Focal Length</u>	<u>Field of View</u>	<u>Size of Sun</u>
28 mm	49° x 74°	0.2 mm
35 mm	39° x 59°	0.3 mm
50 mm	27° x 40°	0.5 mm
105 mm	13° x 19°	1.0 mm
200 mm	7° x 10°	1.8 mm
400 mm	3.4° x 5.1°	3.7 mm
500 mm	2.7° x 4.1°	4.6 mm
1000 mm	1.4° x 2.1°	9.2 mm
1500 mm	0.9° x 1.4°	13.8 mm
2000 mm	0.7° x 1.0°	18.4 mm
2500 mm	0.6° x 0.8°	22.9 mm

Image Size of Sun (mm) = Focal Length (mm) / 109

Solar Eclipse Exposure Guide

<i>ISO</i>		<i>f/Number</i>								
25	1.4	2	2.8	4	5.6	8	11	16	22	
50	2	2.8	4	5.6	8	11	16	22	32	
100	2.8	4	5.6	8	11	16	22	32	44	
200	4	5.6	8	11	16	22	32	44	64	
400	5.6	8	11	16	22	32	44	64	88	
800	8	11	16	22	32	44	64	88	128	
1600	11	16	22	32	44	64	88	128	176	
<i>Subject</i>	<i>Q</i>	<i>Shutter Speed</i>								
<i>Solar Eclipse</i>										
Partial ¹ - 4.0 ND	11	—	—	—	1/4000	1/2000	1/1000	1/500	1/250	1/125
Partial ¹ - 5.0 ND	8	1/4000	1/2000	1/1000	1/500	1/250	1/125	1/60	1/30	1/15
Baily's Beads ²	11	—	—	—	1/4000	1/2000	1/1000	1/500	1/250	1/125
Chromosphere	10	—	—	1/4000	1/2000	1/1000	1/500	1/250	1/125	1/60
Prominences	9	—	1/4000	1/2000	1/1000	1/500	1/250	1/125	1/60	1/30
Corona - 0.1 R _s	7	1/2000	1/1000	1/500	1/250	1/125	1/60	1/30	1/15	1/8
Corona - 0.2 R _s ³	5	1/500	1/250	1/125	1/60	1/30	1/15	1/8	1/4	1/2
Corona - 0.5 R _s	3	1/125	1/60	1/30	1/15	1/8	1/4	1/2	1 sec	2 sec
Corona - 1.0 R _s	1	1/30	1/15	1/8	1/4	1/2	1 sec	2 sec	4 sec	8 sec
Corona - 2.0 R _s	0	1/15	1/8	1/4	1/2	1 sec	2 sec	4 sec	8 sec	15 sec
Corona - 4.0 R _s	-1	1/8	1/4	1/2	1 sec	2 sec	4 sec	8 sec	15 sec	30 sec
Corona - 8.0 R _s	-3	1/2	1 sec	2 sec	4 sec	8 sec	15 sec	30 sec	1 min	2 min

Third Contact

- Moon no longer completely covers Sun
- Same transition, but in reverse, as from First to Second Contact
 - Diamond Ring
 - Baily's Beads
 - ***FILTERS ON!!***
 - Retreating shadow (East)
 - Shadow bands



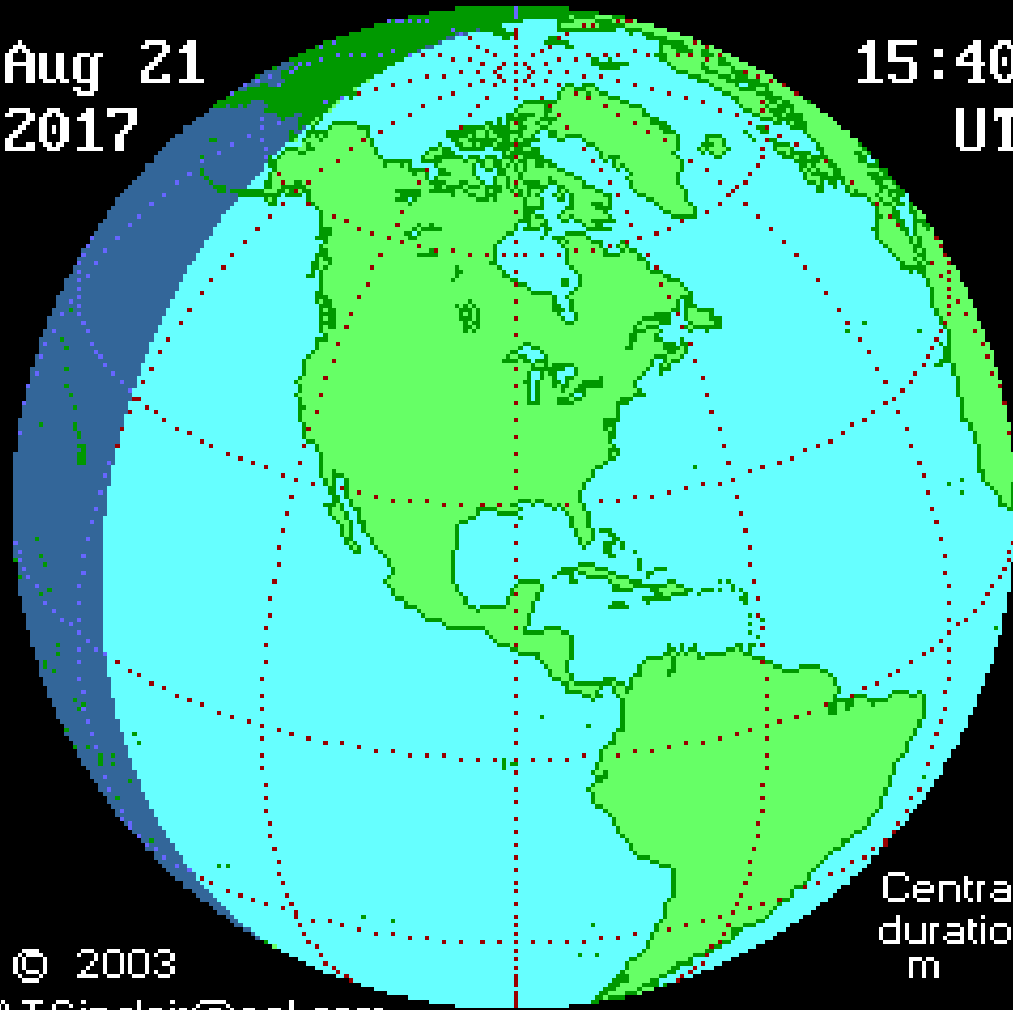
Fourth Contact

- Eclipse Ends (~2:40 PM)
 - Moon has moved eastward completely off the Sun



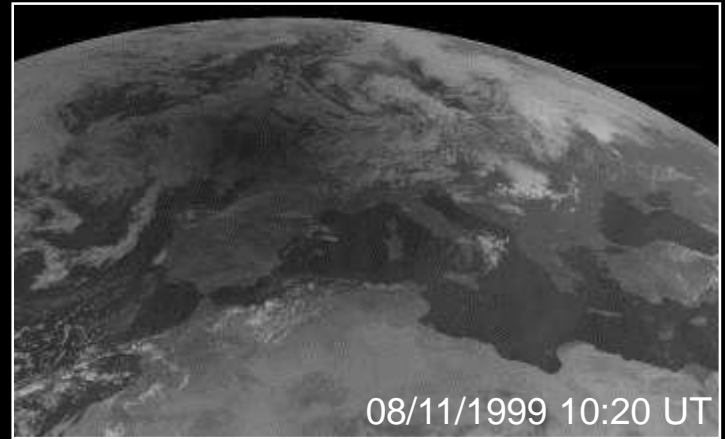
Aug 21
2017

15:40
UT



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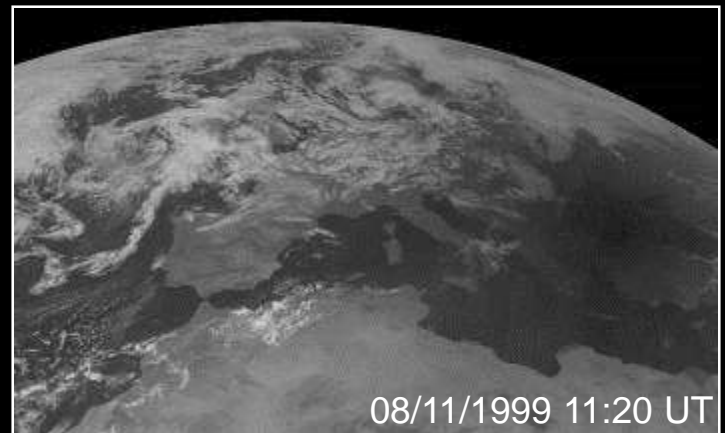
Central
duration
m s



08/11/1999 10:20 UT



08/11/1999 10:50 UT



08/11/1999 11:20 UT

