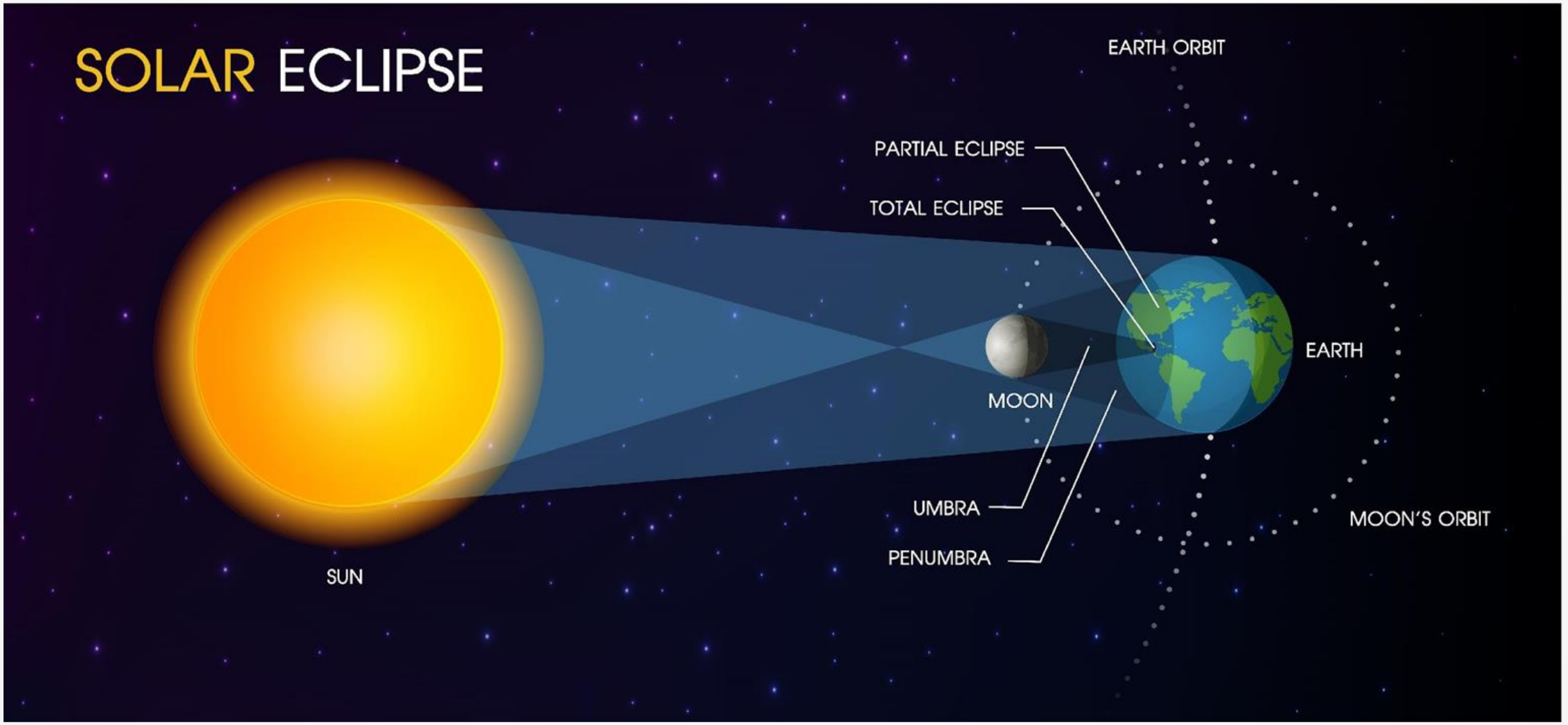
Photographing a Solar Eclipse

by Stephen MacLeod &
Vicki Padesky

What is a Solar Eclipse Anyway?

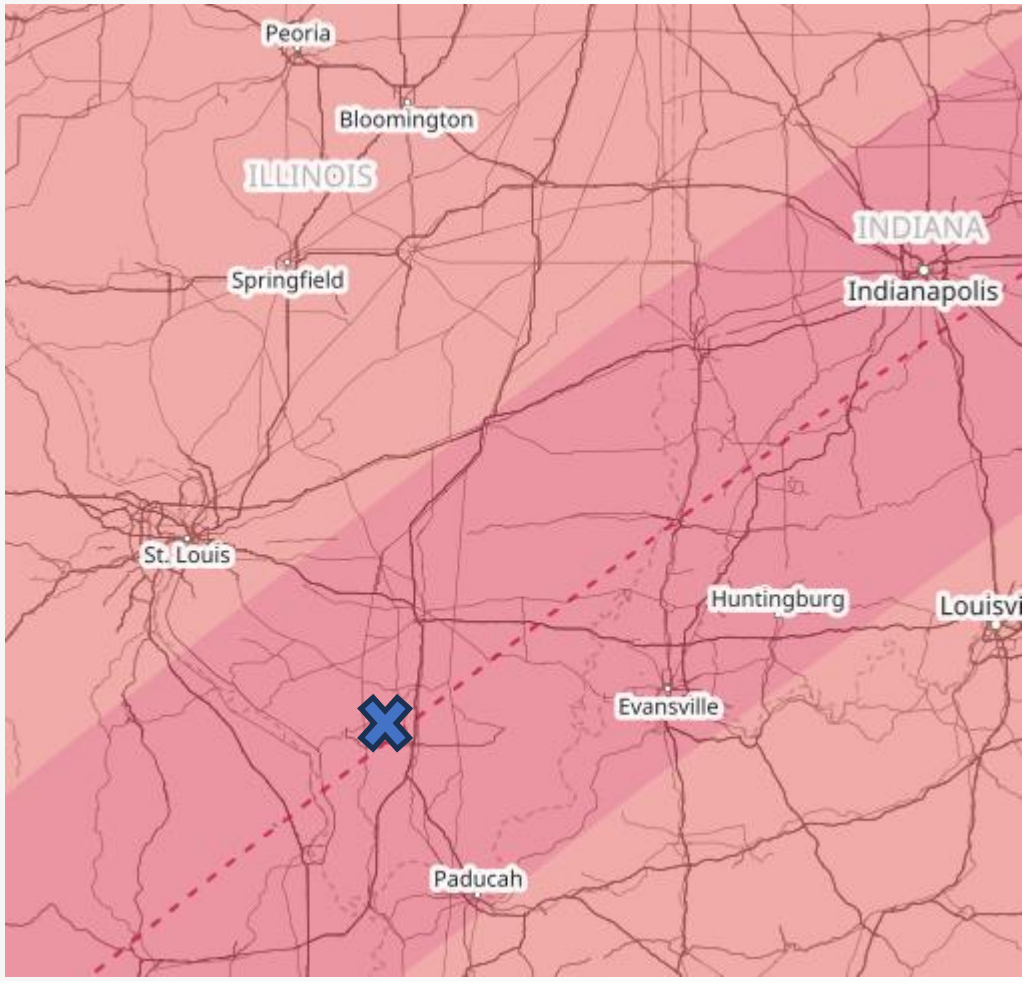
When the Moon passes directly between the earth and the sun



Where? When?

Path of the total solar eclipse occuring Monday April 8, 2024

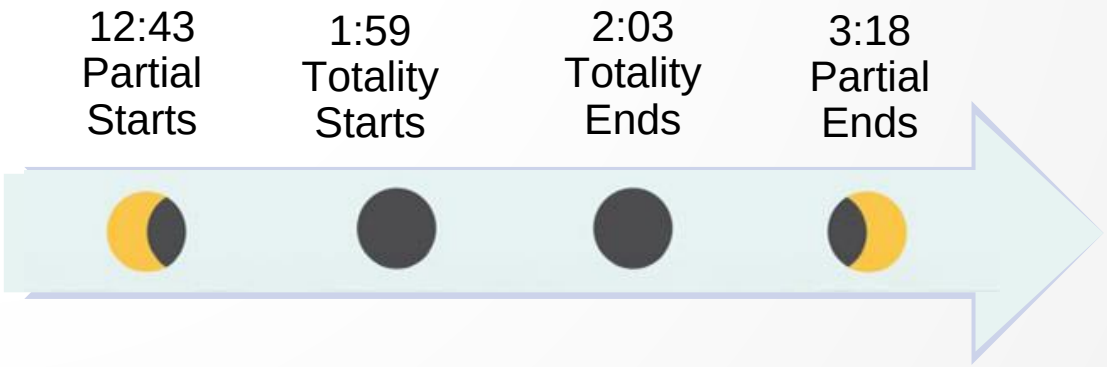
Where? When?



Dark red = Total
Orange = Partial

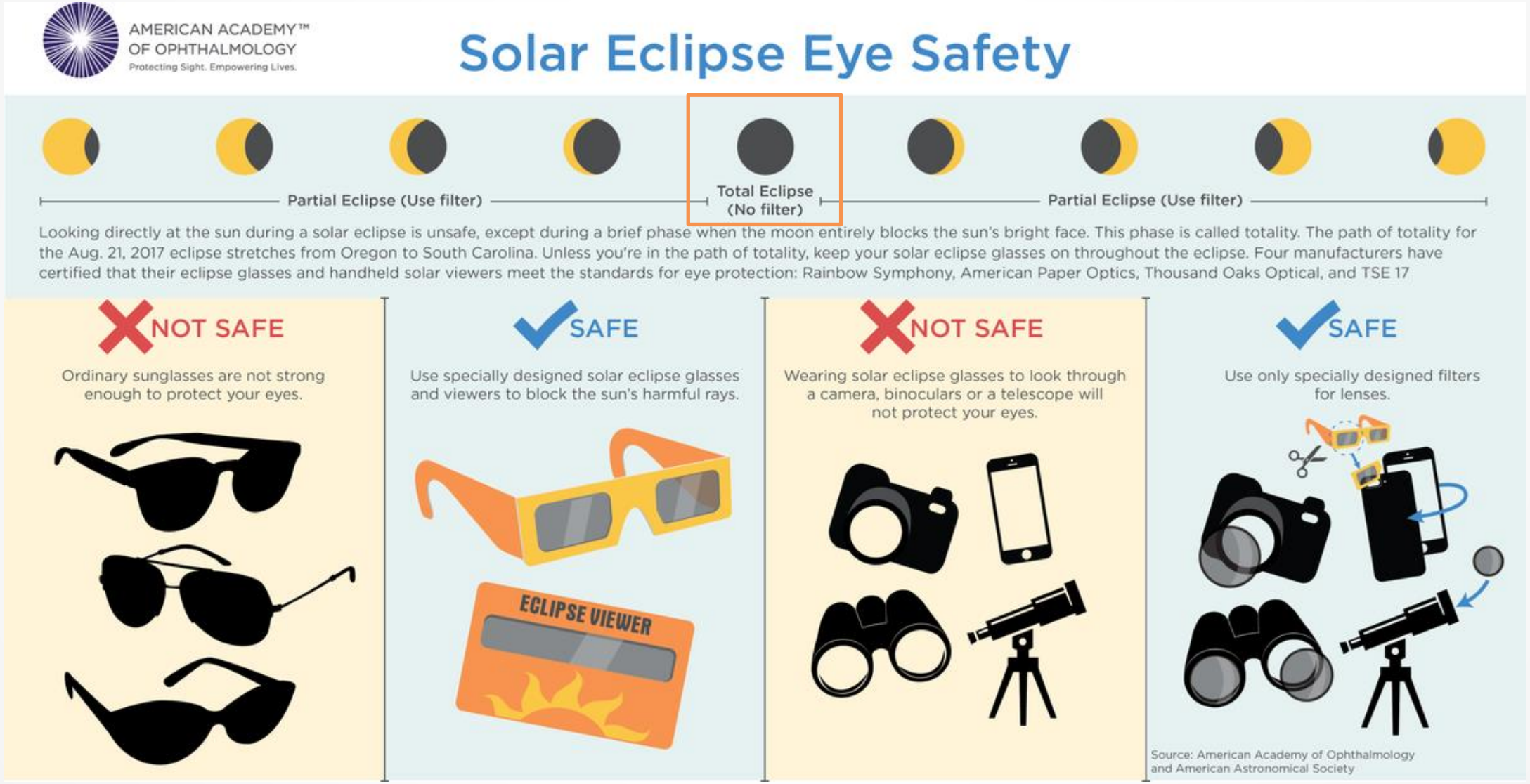
The closer to the dotted red line, the longer totality lasts
Red Dotted line, totality ~ 4 minutes
Edge of Red zone ~ 1.5 minutes

Ex. Carbondale
Approximately 56 Degrees from Horizon



https://www.timeanddate.com/eclipse/map/2024-april-8

Partial Eclipse Safety



View from Peoria area

Partial Eclipse

Apr 8, 2024 at 2:03 pm

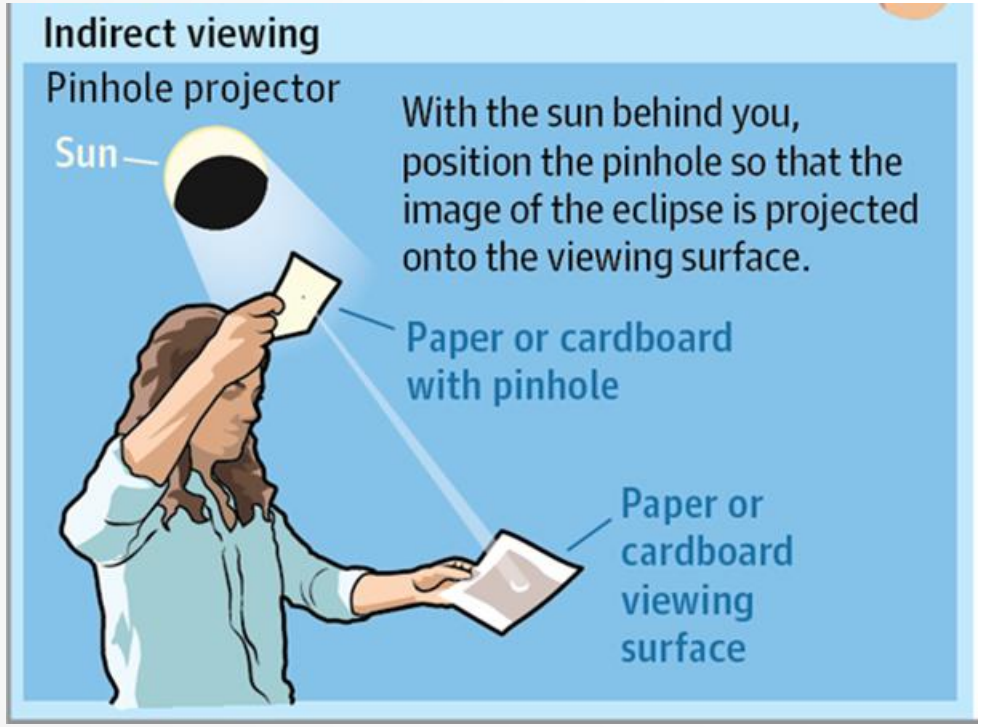
Max View in Peoria, Illinois

Global Event:	Total Solar Eclipse
Partial Solar Eclipse in Peoria	
Begins	12:47 pm
Maximum	2:03 pm
Ends	3:19 pm
Duration:	2 hours, 32 minutes

From timeanddate.com

View from Peoria area

Partial Eclipse



Ways to view

- Watch directly while wearing proper eye protection.
- Look for specular light on the ground
- Pinhole projector
  - Paper or cardboard
  - Pegboard
  - colander

Peoria Riverfront Museum Solar Eclipse Watch Party

Composition

Wide angle lens to get the landscape and eclipse.

Alyn Wallace

Ian Plant

Composition

Realistic or surreal

Launch Photography

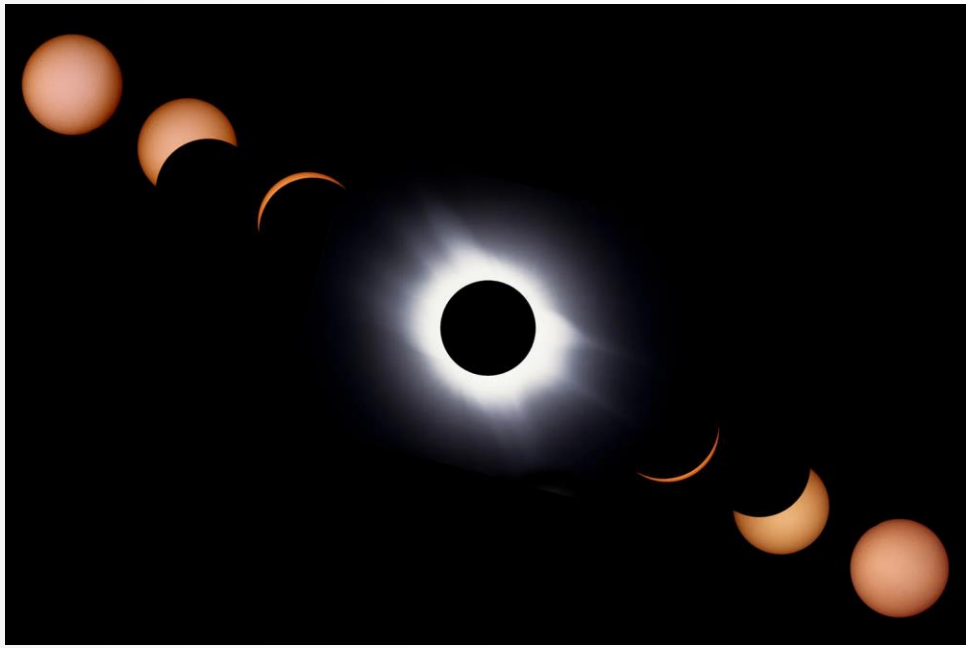
Rajesh Jyothiswaran

Composition

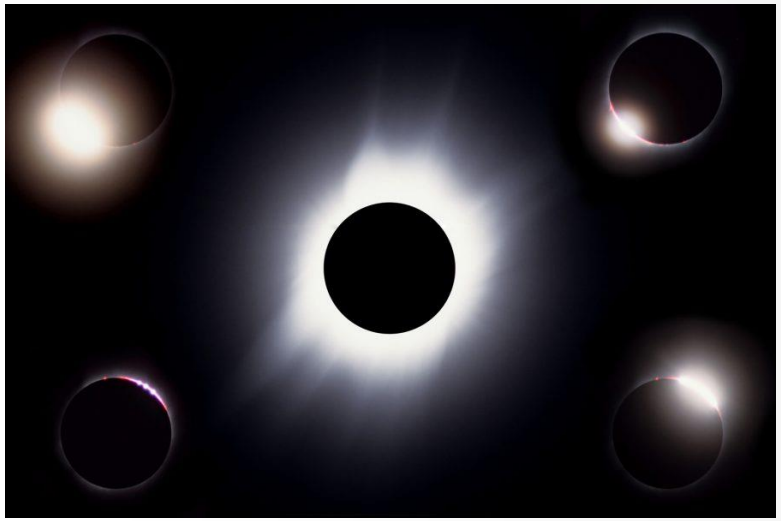
Wide angle lens

Robin Cordiner

Composition



Alex Conu



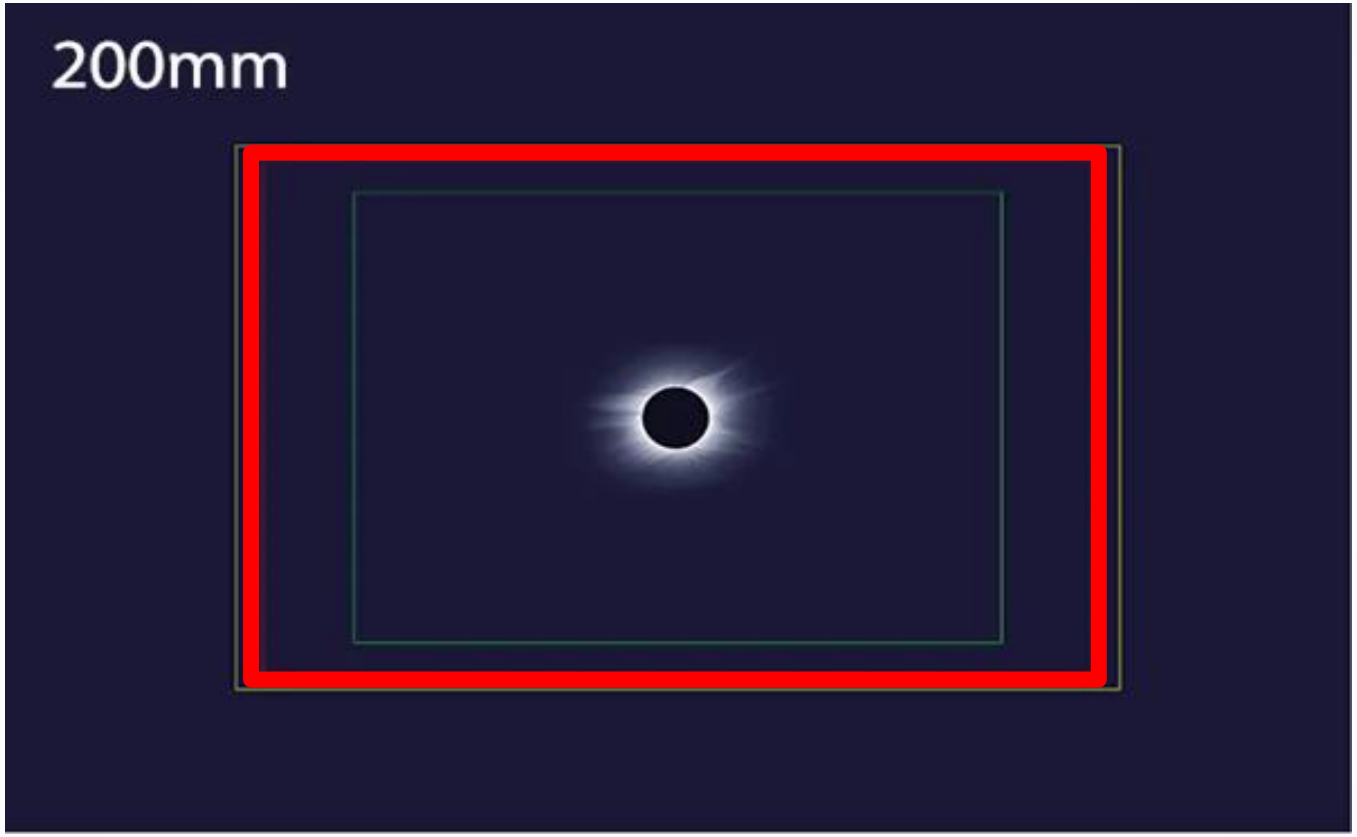
Alex Conu

Alison Craig

Telephoto lens to get the eclipse itself

Composition

Composition

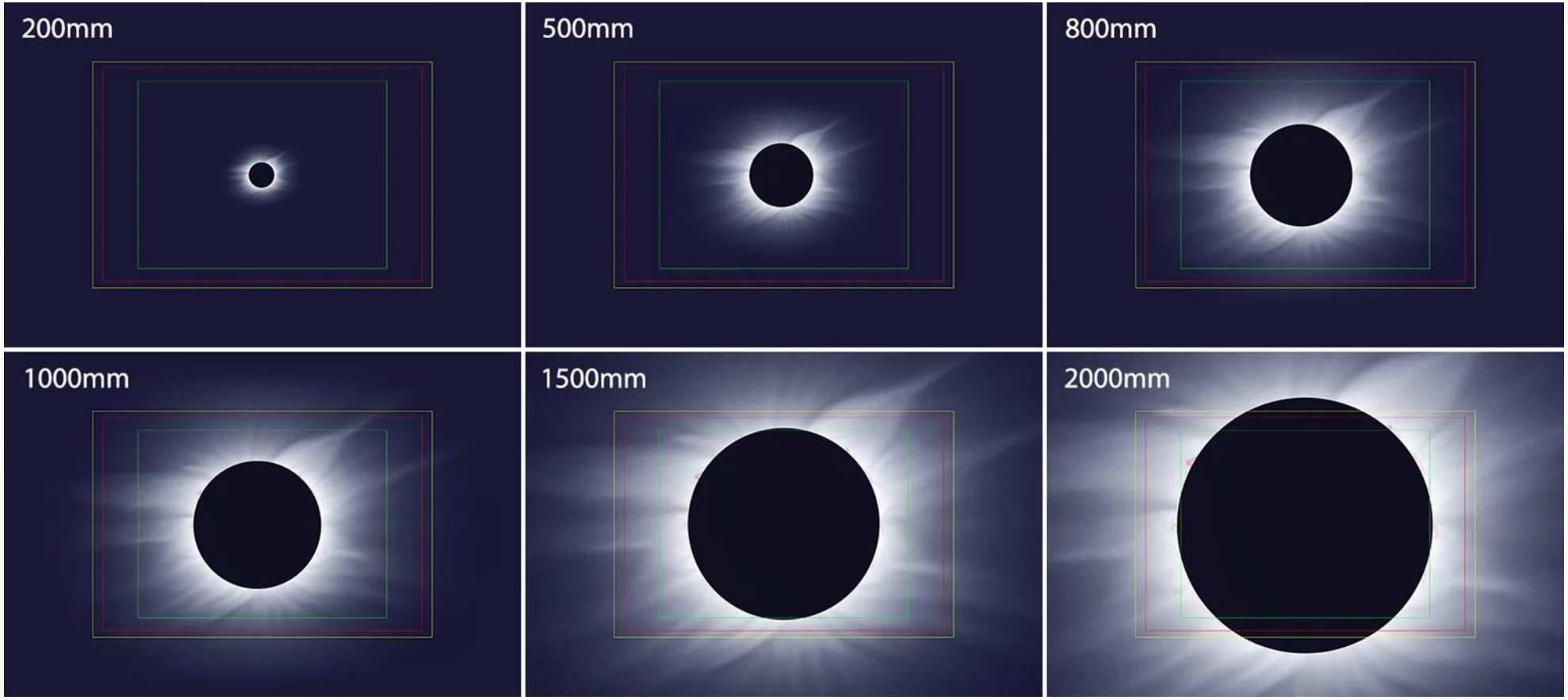


The outer frame is for a full frame sensor.

Photo: Alex Conu

yellow rectangle = Nikon APS-C sensor
red rectangle = Canon APS-C sensor
green rectangle = Micro Four Thirds sensors

Composition



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Gear

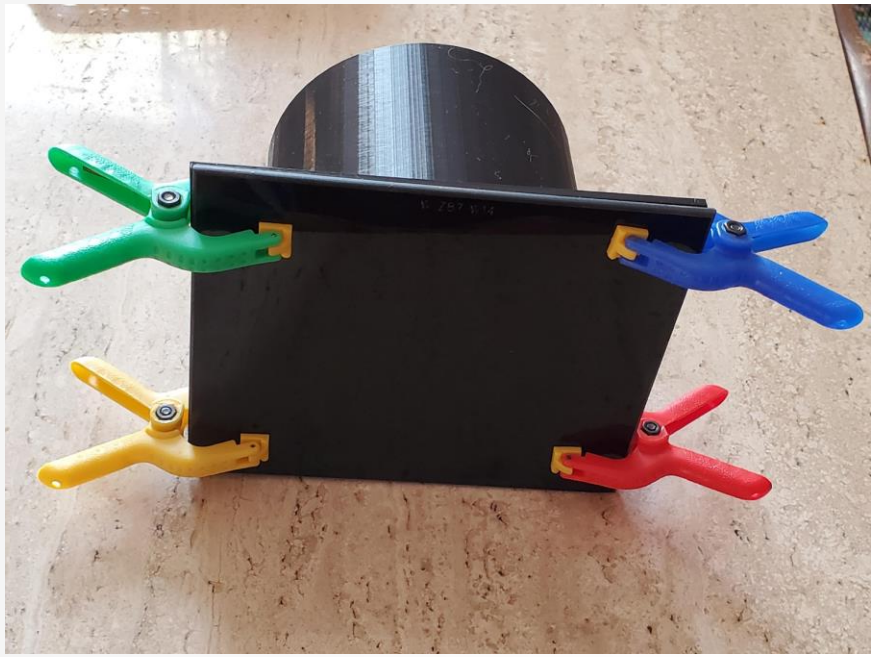
Solar Filter– required for the **partial eclipse**

Slide over lens

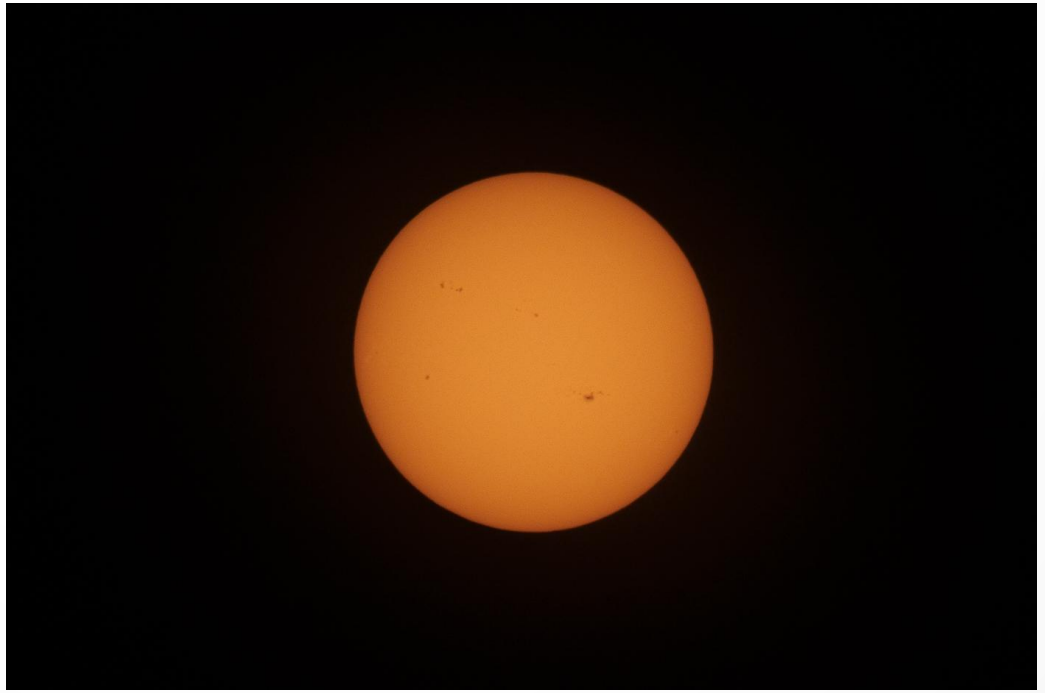
Threaded or square

Handout has a link to B&H PhotoVideo's article.

Gear



- 3D Printed cylinder and plate
- Welders glass or solar filter film clamped to plate
- Cylinder slides over lens
- Many DIY examples online



Solar film
400 mm full frame,
F/6.3, 1/250 sec, ISO 100
Highly cropped

Gear

According to https://www.bhphotovideo.com/explora/photography/buying-guide/lens-filters-for-solar-photography

Mylar® film white light solar viewing filters - Less expensive, not durable, easily punctured, then useless

Dedicated Solar Filter (About 18 stops) – More expensive, but more durable. These should not be used for direct viewing! Good for mirrorless or live view.

Also acceptable is #14 Welders glass
Filters must be on the outer lens, i.e. the lens facing the sun!

All will need color correction in your editing software, so shoot RAW!

You can also make your own:
https://agenaastro.com/articles/guides/how-to-make-a-solar-filter-for-viewing-a-solar-eclipse
https://petapixel.com/2017/08/09/make-solar-eclipse-lens-filters-15-instead-paying-150/
https://improvephotography.com/48165/make-diy-solar-eclipse-filter-lens-2/

Gear

Tripod – take your camera off image stabilization.

Shutter release or intervalometer

Charged batteries

Memory Cards - Fast, formatted, empty

Lens

- Telephoto
  - for eclipse, 200-300 or longer
  - Big details on the corona, use 400-600 at least
- Wide angle for landscape

Gear

Personal Comfort items:

- Chair
- Sunscreen
- Hat
- Snacks & Beverages
- Bug spray
- Restroom access
- Layered clothing
- check the weather and prepare!

Planning/Apps

Apps

‘Totality 3.0’ by Big Kid Science – Interactive map. Gives times and durations. Free

‘Sky Safari’ – Locations of celestial objects

‘Solar Eclipse Timer’ – Pretty much does what the app name suggests. Free to download. In-app purchases.

Photo Pills – to determine location of the sun – scout location. Outdoor photography resource. $

Resources

Lots of resources here:

https://skyandtelescope.org/2024-total-solar-eclipse/eclipse-apps-books-and-more-resources-for-the-2024-total-solar-eclipse/

https://eclipse.aas.org/resources/apps-software

See handout

Camera Settings

Espenak's exposure table

Go full manual

File Format - RAW

ISO – your camera's lowest ISO

Aperture – f/8 or f/5.6

Shutter Speed – Consult exposure table.

Exposure Bracket via Shutter speed.

Focus – prefocus manually

- on the sun WITH SOLAR FILTER
- at infinity
- at something really far away

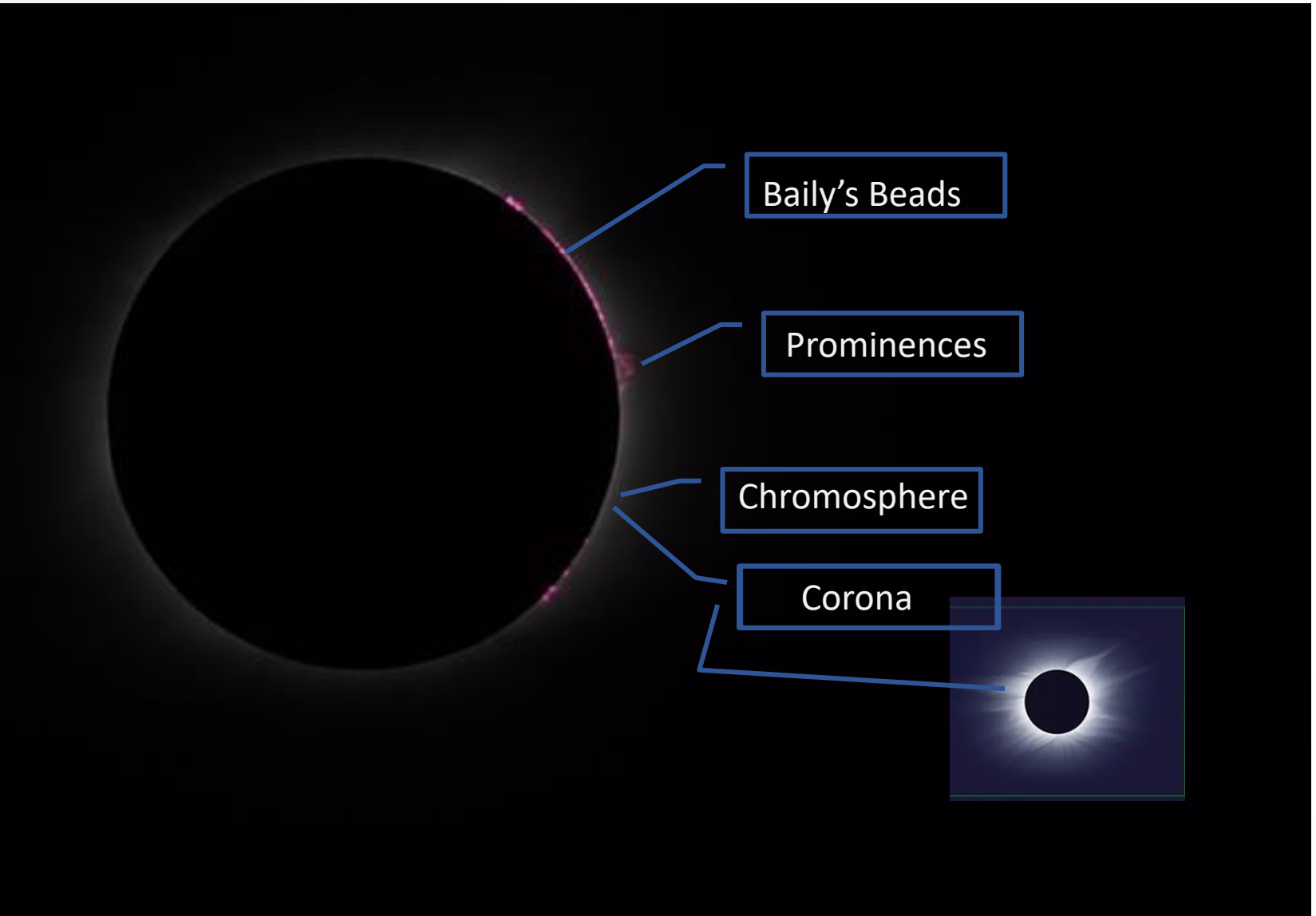
Tip - Consider taping your focus ring tc prevent movement

White balance – auto or daylight

ISO		*f*/Numbe				
25		1.4	2	2.8	4	5.6
50		2	2.8	4	5.6	8
100		2.8	4	5.6	8	11
200		4	5.6	8	11	16
400		5.6	8	11	16	22
800		8	11	16	22	32
1600		11	16	22	32	44

Eclipse Feature	Q	Shutter Spe				
Partial[1] - 4.0 ND	11	—	—	—	1/4000	1/2000
Partial[1] - 5.0 ND	8	1/4000	1/2000	1/1000	1/500	1/250
Baily's Beads[2]	11	—	—	—	1/4000	1/2000
Chromosphere	10	—	—	1/4000	1/2000	1/1000
Prominences	9	—	1/4000	1/2000	1/1000	1/500
Corona - 0.1 Rs	7	1/2000	1/1000	1/500	1/250	1/125
Corona - 0.2 Rs[3]	5	1/500	1/250	1/125	1/60	1/30

Camera Settings



At totality,

- remove the solar filter
- change your Shutter Speed
- Bracket your exposure
- Burst mode

Timing Shots

Phone app

Solar Eclipse Timer

Use a remote shutter release to take your shots while listening for this audible timer.

Intervalometer

Consider an intervalometer to take photos at regular intervals. Many cameras have this built in.
Research for your goal. Suggest a minimum of 5 minutes between shots during partial.
Remember, when the filter is off for totality, the exposure changes greatly.

At Totality shoot and bracket freely.

Wing it

Practice

Take some test shots WITH THE ECLIPSE FILTER ON before the actual event to get used to shooting into the sun

Everything is moving, so you need to move your camera to keep the sun in the frame.

Proper exposure and framing takes thoughtfulness and attention.

Our experiences in 2017

Stephen

- Missouri
- Private residence

Vicki

- SIU – Carbondale
- Festival
- Several days
- More expensive
- My Goal - photograph phases

Carbondale, IL 2017

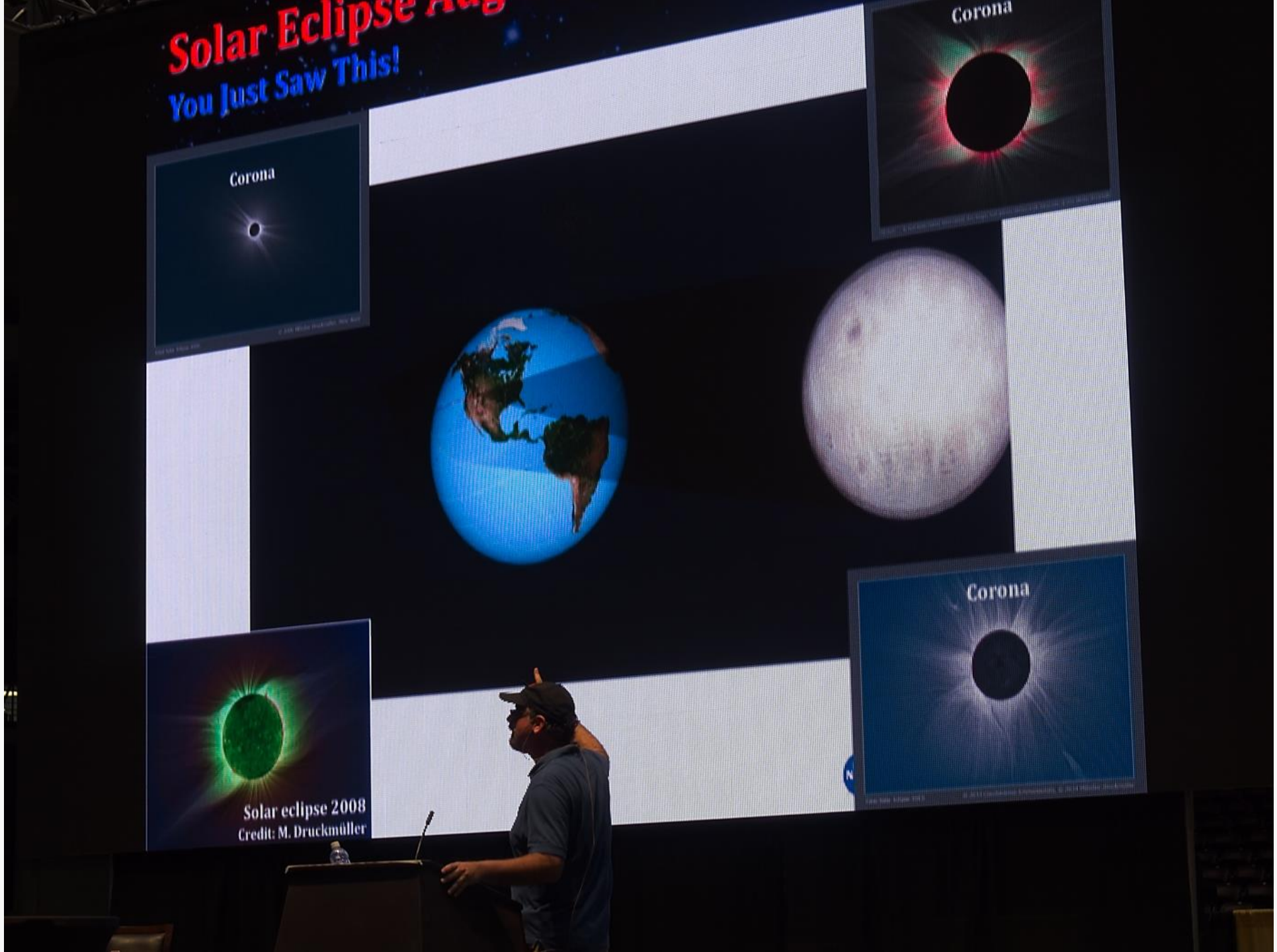
Total Solar Eclipse Event


SAT-LINK
News · Sports · Production


STOP


21 20
YAMAHA
We are UNIVERSITY VILLA
Student APARTMENTS
PETS WELCOME
BY THE BEDROOM LEASING
1,2,3,4
BEDROOMS!


pepsi
pepsi
SIU
SIU


Solar Eclipse Aug
You Just Saw This!
Corona
Corona
Corona
Solar eclipse 2008
Credit: M. Druckmüller


SAT-LINK

Wake Up!
shows over

Thanks for watching

April 8, 2024

Experience it