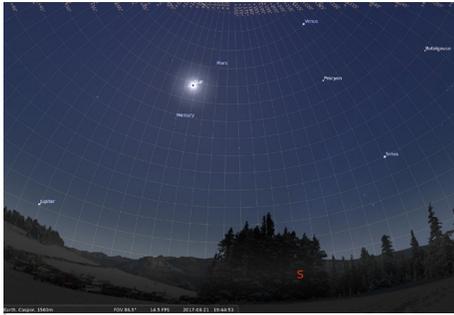


# WHAT (AND HOW) TO SHOOT A TOTAL SOLAR ECLIPSE

Read the entire total solar eclipse tutorial by astrophysicist and photographer, Alex Conu:  
<https://photographingspace.com/eclipse>



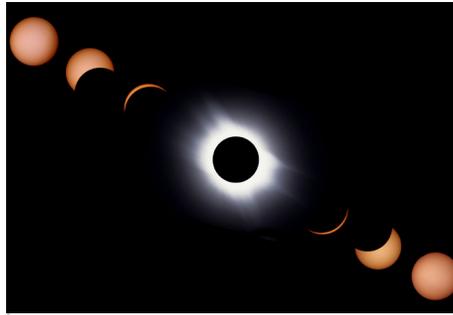
## 1. WIDE-FIELD LANDSCAPES DURING TOTALITY

**Focal length:** 14-24mm

**Tip:** The Sun will be high in the sky so you will need to have a large or dramatic object in the foreground to get a well-balanced image.

**How:** During totality, start at ISO 400 f/5.6 and 1 second of exposure time. Possibly use Aperture priority and Auto modes.

*Note: 4 planets will be visible during totality; Mercury, Venus, Mars, and Jupiter. Bright stars like Sirius, Betelgeuse, Rigel, Capella or Arcturus will also be visible. Look out for Orion above the south-western horizon.*



## 2. SEQUENCE OF THE ENTIRE ECLIPSE SEQUENCE

**When:** Start at C1 and end at C4

**How:** Use a solar filter for partial phases. Shoot every five minutes during partial phases (but more during totality) and then assemble the photos in Photoshop using the lighten blending mode.



## 3. DIAMOND RING

The last tiny bit of the sun peeking out from behind the moon causing a bright point of light in photographs.

**Focal length:** At least 400mm is best

**When:** Around 10 seconds before and after totality, just before C2 and just after C3.

**How:** Shoot 1/400-1/10s exposures quickly because this lasts just a few seconds and happens just before Bailey's Beads.



## 4. BAILY'S BEADS

Small bead-like points of light that move around the disc of the sun for a short period of time just before and after totality.

**Focal length:** At least 400mm is best

**When:** A few seconds before totality

**How:** Start shooting short exposures ~10 seconds before C2 and for ~10 seconds after C3. Shoot in burst mode as the aspect of the beads changes very fast.



## 5. CHROMOSPHERE AND PROMINENCES

The 2nd layer of the sun's atmosphere, red in color, and any eruptions (prominences) on the surface that are large enough to be visible.

**Focal length:** 500-2000mm focal length on a full-frame camera

**When:** Only visible for around 10 seconds after C2 and 10 seconds before C3.

**How:** Short exposure times are required for the chromosphere and prominences.



## 6. CORONA

A "crown" of plasma surrounding the sun that extends millions of kilometers outward from the surface, visible to the naked eye during totality.

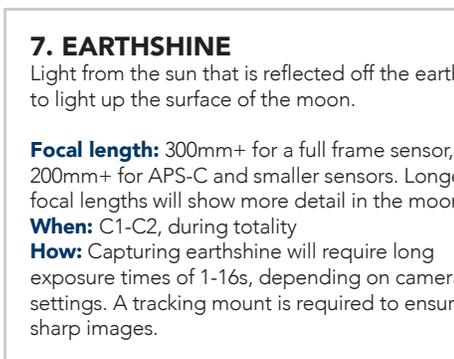
**Focal length:** 400-800mm for a full frame sensor. For detailed images of the corona during totality at least 200mm of focal length on a full frame camera. 500mm reveals all those long coronal streamers in a longer exposure.

**When:** C1-C2, during totality

**How:** The dynamic range of the corona is so huge that you can use nearly all exposure times available on your camera from 1/4000 to 6-8 seconds and get a different aspect of the corona in each image.

**Short exposure times** capture the bright corona close the solar disk. Exposure lengths of 1/3200-1/25s

**Long exposure times** capture the faint streamers a few solar radii in length. Exposure lengths of 1/2-8s. For these long exposures, a tracking mount may be required to ensure sharp images. Note the inner corona will be overexposed.



## 7. EARTHSHINE

Light from the sun that is reflected off the earth to light up the surface of the moon.

**Focal length:** 300mm+ for a full frame sensor, 200mm+ for APS-C and smaller sensors. Longer focal lengths will show more detail in the moon.

**When:** C1-C2, during totality

**How:** Capturing earthshine will require long exposure times of 1-16s, depending on camera settings. A tracking mount is required to ensure sharp images.



**Eclipse contact points:** **C1, first contact:** When the moon first starts to block the sun | **C2, second contact:** The beginning of totality, just as the sun is completely blocked by the moon | **C3, third contact:** The end of totality, just as the sun starts to show itself again | **C4, fourth contact:** When the sun is no longer blocked by the moon

**STEP 1:** Select the event to shoot  
**STEP 2:** Select your lens aperture (f/number) and ISO  
**STEP 3:** Follow the chart to the recommended exposure length

**Example:**

Corona, 1 solar radius:  
 f/5.6 at ISO 400 equals  
 1/50 second exposure.

# EXPOSURE TIMES SUGGESTED EXPOSURE LENGTHS FOR THE MAJOR SOLAR ECLIPSE EVENTS

Compiled using Xavier Jubier's Solar Eclipse Exposure Calculator

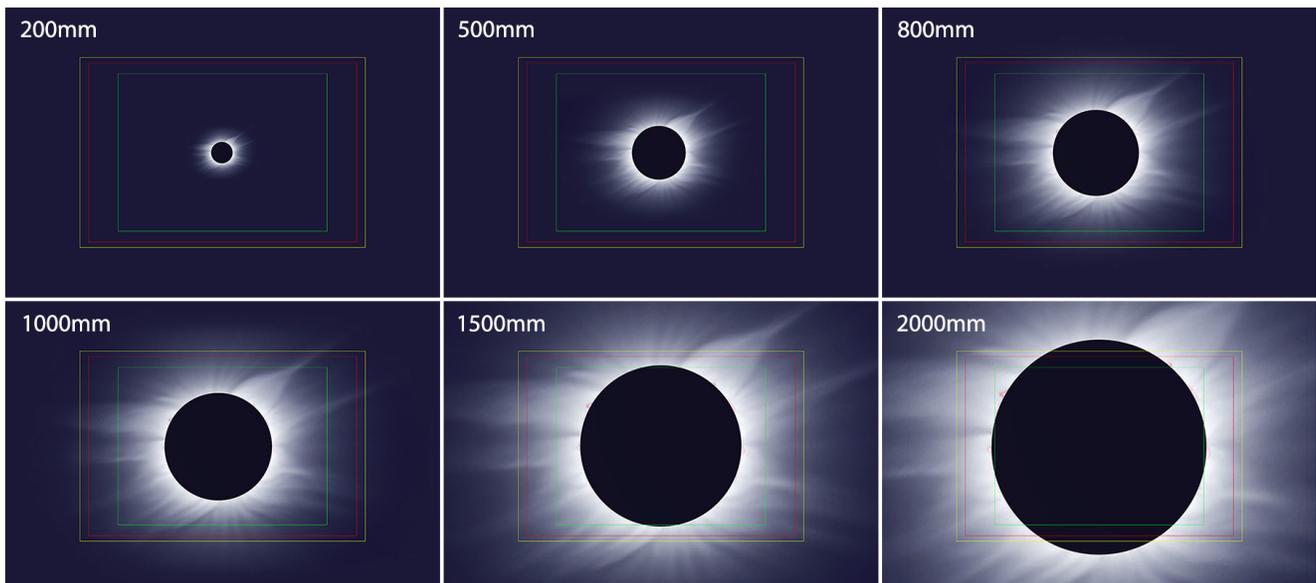
ISO	APERTURE (F/number)					
100	2.8	4	5.6	8	11	16
200	4	5.6	8	11	16	22
400	5.6	8	11	16	22	32
800	8	11	16	22	32	44
1600	11	16	22	32	44	64

ECLIPSE FEATURE	EXPOSURE TIME					
Partial Phases (ND5 filtered)	1/6400	1/3200	1/1600	1/800	1/400	1/200
Diamond Rings	1/400	1/200	1/100	1/50	1/25	1/13
Baily's Beads	<1/8000	<1/8000	1/8000	1/4000	1/2000	1/1000
Chromosphere	<1/8000	<1/8000	1/6400	1/3200	1/1600	1/800
Prominences	<1/8000	1/6400	1/3200	1/1600	1/800	1/400
Corona (1/2 Solar Radius)	1/200	1/100	1/50	1/25	1/13	1/6
Corona (1 Solar Radius)	1/50	1/25	1/13	1/6	1/3	1/1.6
Corona (2 Solar Radius)	1/25	1/13	1/6	1/3	1/1.6	1
Corona (8 Solar Radius)	1	2	4	8	16	32
Earthshine	1	2	4	8	16	32

**NOTE:** Sky conditions will influence exposure time. Use this exposure table as a guideline for clear sky conditions.

A motorized tracking mount is recommended for focal lengths longer than 400mm with longer exposures.

## FOCAL LENGTH VS. SENSOR SIZE



Outer frame: full-frame ■ Nikon APS (crop) ■ Canon APS-C (crop) and equivalent ■ Micro 4/3

Image Credits; Alex Conu