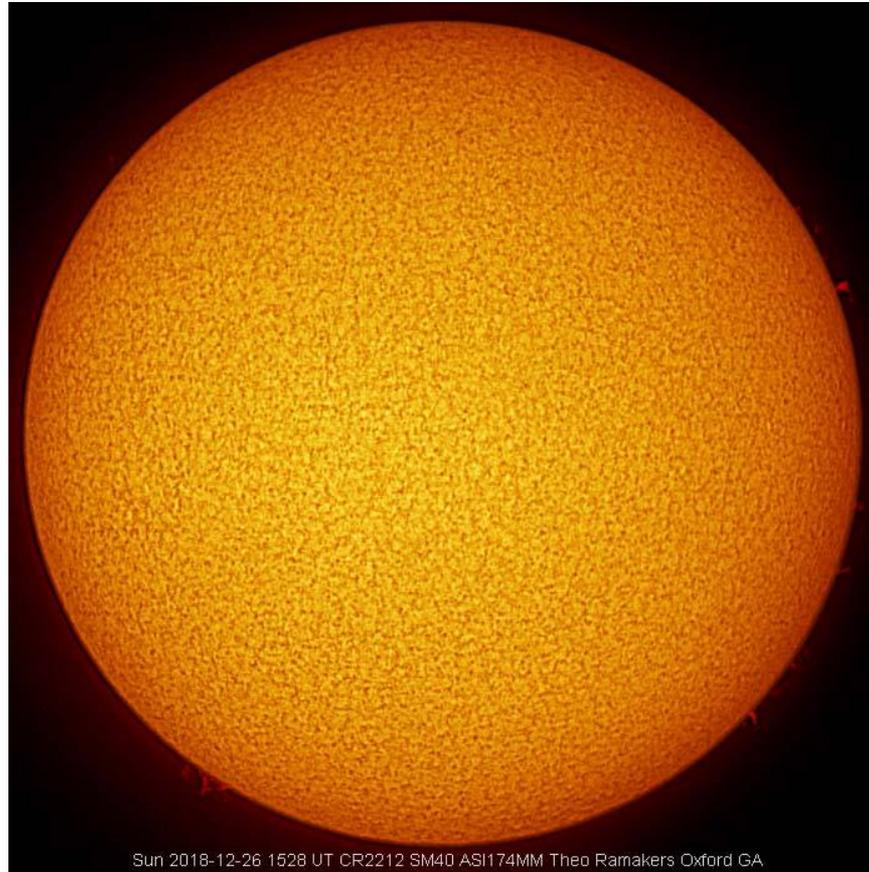


# ASTROPHOTOGRAPHY TARGETS

## Jan-Feb 2019



The Sun in Hydrogen Alpha

12-26-18

By Theo Ramakers

# Visual/Bino Targets

- **Quadrantid Meteor Shower:** Jan 4-7. The Quadrantid meteor shower will reach its maximum rate of activity on 4 January 2019. This is very low on the horizon to the north east. Look to the lower left of the handle of the big dipper. Due to the proximity to the horizon we may only see a few per hr. The peak is Jan 4.
- **Conjunction of the Moon and Mars:** Jan 12. The Moon and Mars will make a close approach, passing within  $4^{\circ}58'$  of each other. The Moon will be 6 days old. From Atlanta, the pair will become visible at around 18:05 (EST) as the dusk sky fades,  $58^{\circ}$  above your southern horizon. They will then sink towards the horizon, setting 6 hours and 1 minute after the Sun at 23:48. The pair will be too widely separated to fit within the field of view of a telescope, but will be visible to the naked eye or through a pair of binoculars.
- **Total Lunar Eclipse:** Jan 20-21. The Moon will pass through the Earth's shadow between 22:35 and 01:51 EST, creating a total lunar eclipse. It will be visible from Atlanta in the south-eastern sky. The Moon will lie  $74^{\circ}$  above the horizon at the midpoint of the eclipse. The total eclipse will last from 23:42 until 00:44. The Moon will be partially eclipsed between 22:35 and 01:51 (all times given in Atlanta time).
- **Moon and M44:** Jan 22. The Moon and M44 (Beehive Cluster) will make a close approach, passing within  $0^{\circ}16'$  of each other. The Moon will be 15 days old. From Atlanta, the pair will be visible in the morning sky, becoming accessible at around 18:58, when they rise  $7^{\circ}$  above your eastern horizon. They will then reach its highest point in the sky at 01:16,  $75^{\circ}$  above your southern horizon. The pair will be close enough to fit within the field of view of a telescope, but will also be visible through a pair of binoculars.

[www.earthsky.org](http://www.earthsky.org)

<https://in-the-sky.org/>

# Beginner/Intermediate Target

The Moon – Total Eclipse



October 8, 2014

by Jonny Horne

# Seeing the Eclipse

**When:** Evening of Jan 20 to early morning of Jan 21

**Visually:**

Your naked eyes will do great. A pair of binoculars during totality helps. Get a comfortable chair and warm clothes. Time period leading up to totality can seem to drag on, particularly when it's cold. Totality is cool with orange and red colors for the moon.

**Photographing the eclipse:**

- You can use a DSLR with a telephoto or zoom lens, 200mm or higher is best.
- Use a tripod to hold your camera. You will need to track the movement of the moon during the evening.
- Use a remote shutter release or an intervalometer to automatically take pictures at selected intervals.
- If you have a tracking telescope mount you can use your mount and telescope to track and photograph the eclipse. Consider a telescope under 1500mm to get the full disk, pending your camera.
- You can also attach your DSLR with a telephoto lens to your tracking mount.
- Consider taking still frames from the start of the eclipse to just up to totality and after.
- Consider switching to video with your camera during totality for a time lapse or for a better chance to get crisp pictures of totality. Make sure to have a big storage card or ssd for video.
- When using still frames place your camera settings in RAW picture mode instead of JPG. RAW is easier to edit if your exposure is off but does use more sd space.

# Eclipse Timing

The animation shows what the eclipse approximately looks like in [Atlanta](#). Stages and times of the eclipse are outlined below. All times are local time (EST) for Atlanta.

Time	Phase	Event	Direction	Altitude
9:36 pm <i>Sun, Jan 20</i>		<b>Penumbral Eclipse begins</b> <i>The Earth's penumbra start touching the Moon's face.</i>	 95°	 46.3°
10:33 pm <i>Sun, Jan 20</i>		<b>Partial Eclipse begins</b> <i>Partial moon eclipse starts - moon is getting red.</i>	 106°	 57.6°
11:41 pm <i>Sun, Jan 20</i>		<b>Total Eclipse begins</b> <i>Total moon eclipse starts - completely red moon.</i>	 128°	 69.8°
12:12 am <i>Mon, Jan 21</i>		<b>Maximum Eclipse</b> <i>Moon is closest to the center of the shadow.</i>	 146°	 74.0°
12:43 am <i>Mon, Jan 21</i>		<b>Total Eclipse ends</b> <i>Total moon eclipse ends.</i>	 173°	 76.2°
1:50 am <i>Mon, Jan 21</i>		<b>Partial Eclipse ends</b> <i>Partial moon eclipse ends.</i>	 226°	 71.0°
2:48 am <i>Mon, Jan 21</i>		<b>Penumbral Eclipse ends</b> <i>The Earth's penumbra ends.</i>	 248°	 61.1°

<https://www.timeanddate.com/eclipse/in/usa/atlanta>

# Eclipse Data

Use the table below to estimate the exposure you will need based on your camera/lens or camera/telescope combination. You should be able to set your camera to an ISO of 400-800 to reduce noise.

<http://www.mreclipse.com/LEphoto/LEphoto.html>

## Lunar Eclipse Exposure Guide

ISO	f/Number									
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	

Eclipse Phase	Q	Shutter Speed												
<b>No Eclipse</b>														
Full Moon	8	1/4000	1/2000	1/1000	1/500	1/250	1/125	1/60	1/30	1/15				
<b>Penumbral Eclipse</b>														
Magnitude = 1.0	7	1/2000	1/1000	1/500	1/250	1/125	1/60	1/30	1/15	1/8				
<b>Partial Eclipse</b>														
Magnitude = 0.00	7	1/2000	1/1000	1/500	1/250	1/125	1/60	1/30	1/15	1/8				
Magnitude = 0.30	6	1/1000	1/500	1/250	1/125	1/60	1/30	1/15	1/8	1/4				
Magnitude = 0.60	5	1/500	1/250	1/125	1/60	1/30	1/15	1/8	1/4	1/2				
Magnitude = 0.80	4	1/250	1/125	1/60	1/30	1/15	1/8	1/4	1/2	1 sec				
Magnitude = 0.90	3	1/125	1/60	1/30	1/15	1/8	1/4	1/2	1 sec	2 sec				
Magnitude = 0.95	2	1/60	1/30	1/15	1/8	1/4	1/2	1 sec	2 sec	4 sec				
<b>Total Eclipse</b>														
Danjon Value: L=4	-3	1/2	1 sec	2 sec	4 sec	8 sec	15 sec	30 sec	1 min	2 min				
Danjon Value: L=3	-5	2 sec	4 sec	8 sec	15 sec	30 sec	1 min	2 min	4 min	8 min				
Danjon Value: L=2	-7	8 sec	15 sec	30 sec	1 min	2 min	4 min	8 min	15 min	30 min				
Danjon Value: L=1	-9	30 sec	1 min	2 min	4 min	8 min	15 min	30 min	—	—				
Danjon Value: L=0	-11	2 min	4 min	8 min	15 min	30 min	—	—	—	—				

### Instructions

Choose the ISO speed in the upper left column. Next, select the f/number of the lens or telescope (on same line as ISO). Finally, drop straight down to the bottom table to get the correct exposure for each stage of the lunar eclipse. The magnitude of a partial eclipse is the fraction of the Moon's diameter immersed in Earth's umbral shadow (in the case of a penumbral eclipse, it is the penumbral shadow).

Note that the brightness of a total eclipse varies with different Danjon values (L). All exposure times in this guide are estimates. For best results, use them as a guide and bracket your exposures.

Exposure Formula:  $t = f^2 / (I \times 2^Q)$  where: t = exposure time (sec); f = f/number;  
I = ISO speed; Q = brightness value

## Danjon Scale of Lunar Eclipse Brightness

Danjon Value	Description
L = 0	Very dark eclipse. Moon almost invisible, especially at mid-totally.
L = 1	Dark Eclipse, gray or brownish in coloration. Details distinguishable only with difficulty.
L = 2	Deep red or rust-colored eclipse. Very dark central shadow, while outer edge of umbra is relatively bright.
L = 3	Brick-red eclipse. Umbral shadow usually has a bright or yellow rim.
L = 4	Very bright copper-red or orange eclipse. Umbral shadow has a bluish, very bright rim.

# Advanced Target

Caldwell 49 – Rosette Nebula



By Chris Horne

15x C11 Edge @ f/2, unguided, 2/14/18

ASI1600MM-Pro

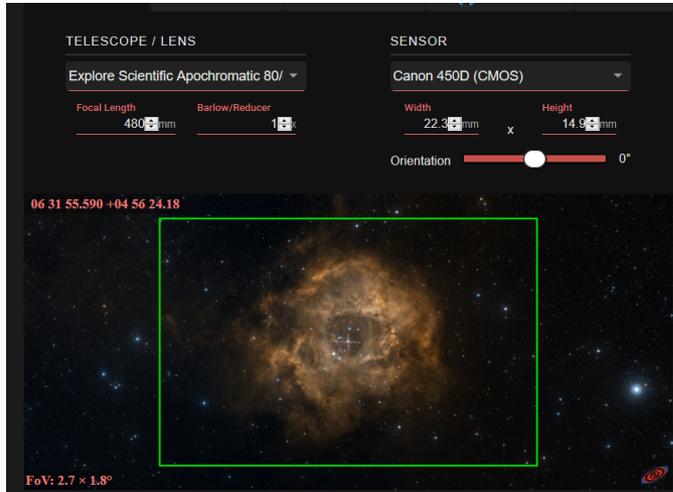
50 x 60s Ha, 50 x 30s OIII, HOO processing via Pixinsight

# The Rosette Nebula

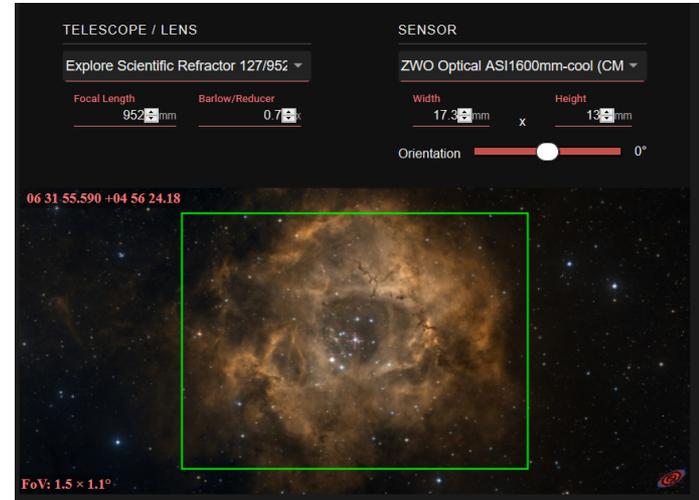
- **Designation:** Caldwell 49. Also contains open cluster NGC 2244
- **Constellation:** Monoceros
- **Coordinates:** 06h 32.3m, +05 03'
- **Size:** 80 x 60 arcmin
- **How to shoot:** Use smaller scope under 500mm for full nebula.
- **Camera Equipment:** RGB, single shot cameras or DSLR will work for this bright target. Ha can be used to enhance red channel or use Ha or red for your luminance layer in Photoshop blending.
  
- *The 100 Best Astrophotography Targets by Ruben Kier*

# Observation Data

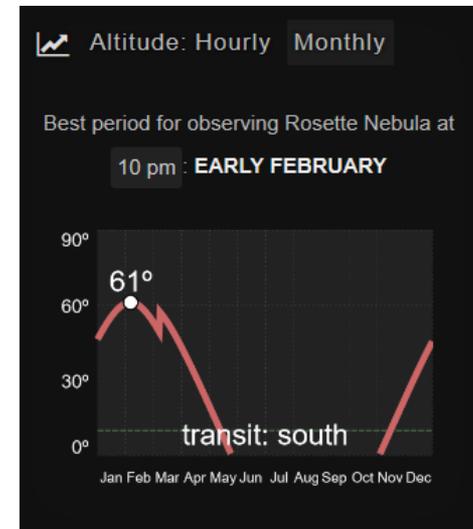
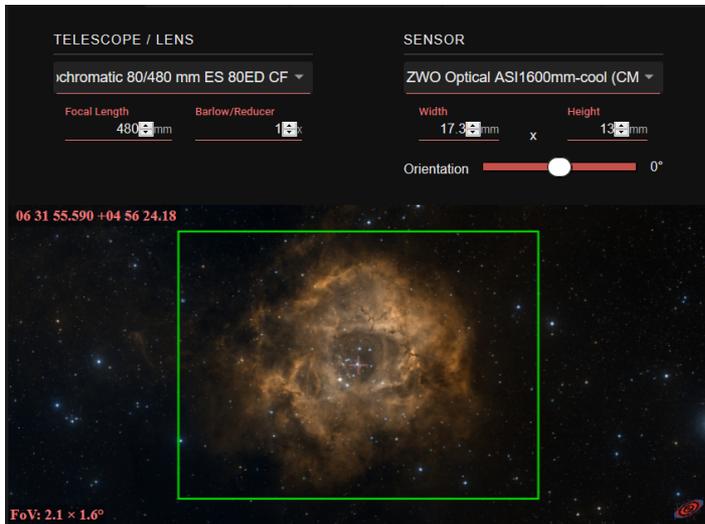
## 80mm Refractor w/ Canon DSLR



## 127mm Refractor .7x w/ ASI1600mm



## 80mm Refractor & ASI1600mm



<https://dso-browser.com/deep-sky/object/10578/rosette-nebula>

# Software and Data Sources

- **Astrophotography planning:** *DSO Browser* - <https://dso-browser.com/>
- **Field of View Calculators for different equipment:** *New Astronomy Press CCD Calculator* - [http://www.newastro.com/book\\_new/camera\\_app.html](http://www.newastro.com/book_new/camera_app.html)
- **Planetarium Software:** *Stellarium* - <http://www.stellarium.org/>
- **Weekly sky events:** *Skyweek App* - [Google play](#)
- **Monthly and weekly sky events:**
  - <http://www.skyandtelescope.com/observing/sky-at-a-glance/>
  - <http://www.skymaps.com/downloads.html>
- **Book:** *The 100 Best Astrophotography Targets* by Ruben Kier