

Photographing Solar Eclipses

(What Lessons Have I Learned in 44 Years?)

Fred Espenak, *Scientist Emeritus*

NASA's Goddard Space Flight Center

POSITIVE LESSON

Do this!

NEGATIVE LESSON

Don't do this!



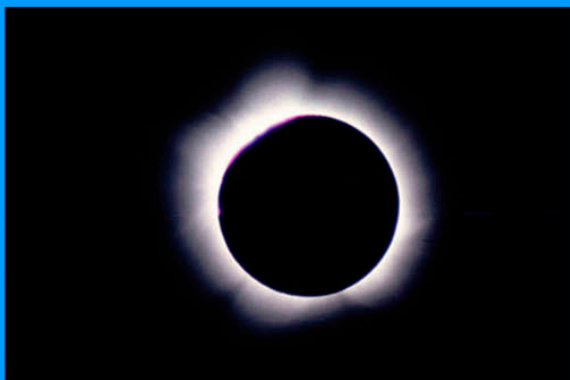
Use the biggest, heaviest TRIPOD available!
Unwanted vibrations blur many Eclipse photos!



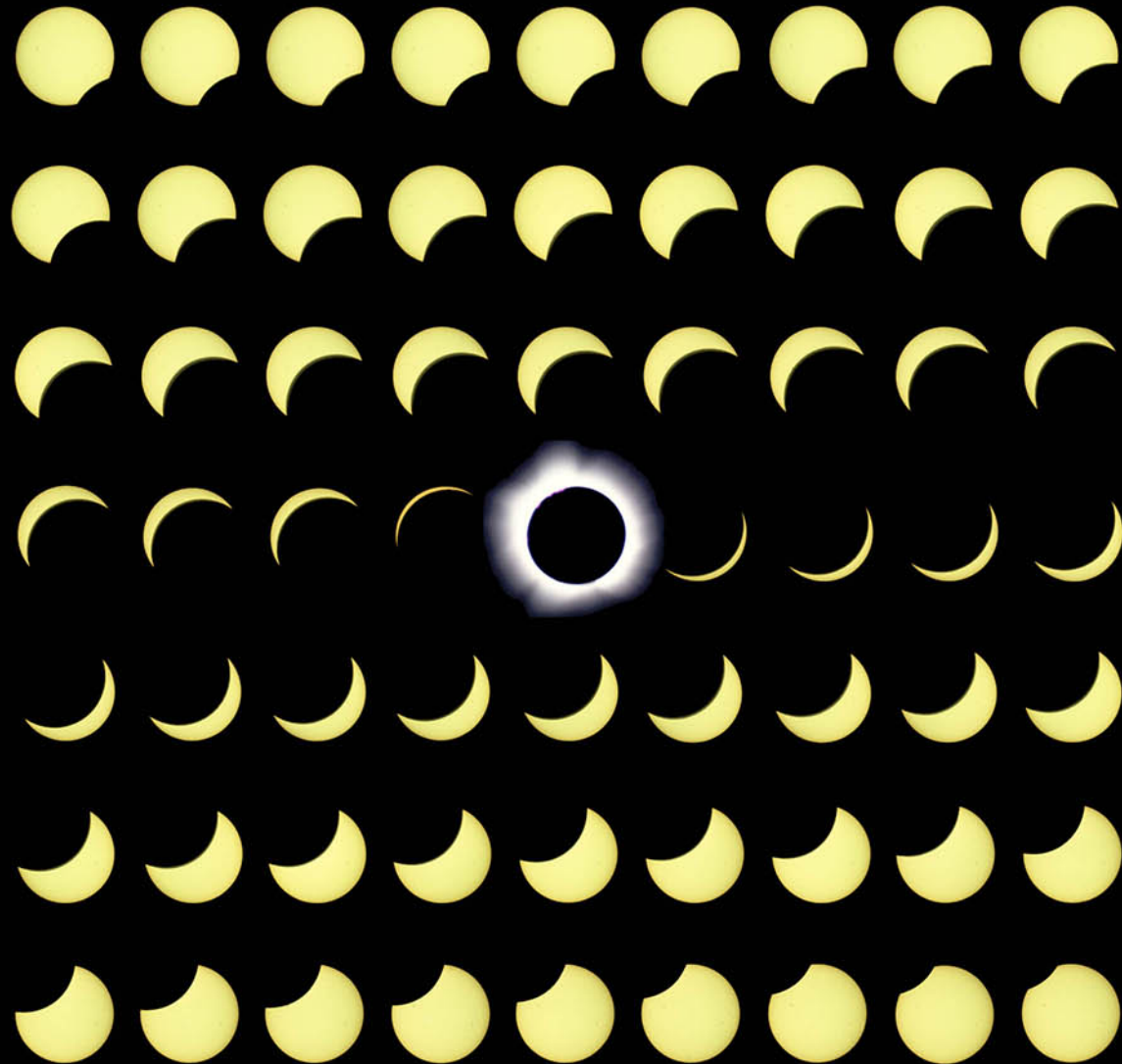
Total Solar Eclipse - 1970 Mar 07



**Don't try to "fix" problems during TOTALITY!
Give up and just watch!**



Shoot more photos than you think you need!
Better to have too many than too few!



Canada's Total Eclipse of 1972 Jul 10



**Everyone gets CLOUDED OUT.
Don't let it discourage you.**



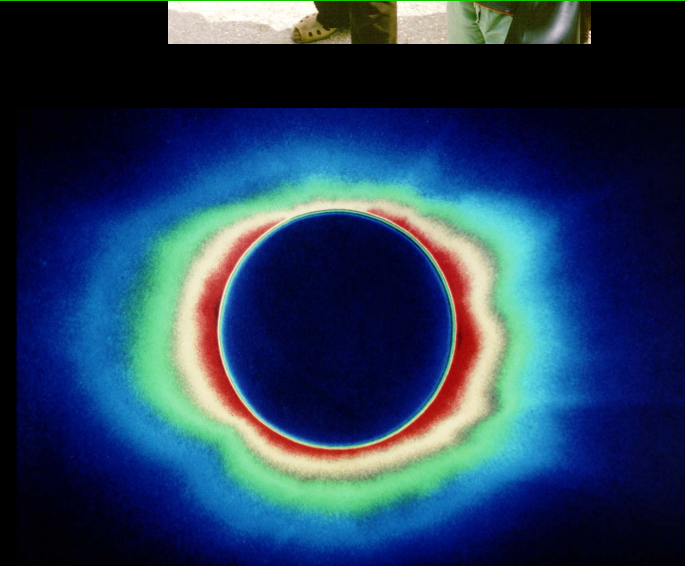
Sahara's Total Solar Eclipse of 1973 Jun 30



**Embrace exotic and remote destinations.
They enhance the eclipse experience.**



Saros 136



Kenya's Total Solar Eclipse of 1980 Feb 16



Be prepared to move at the last minute!



1990 Total Solar Eclipse at 32,000 Feet

Shoot video at EVERY eclipse!

Consider an aerial rendezvous eclipse!



1990 Jul 26 - Finland

Totality Over Bolivia 1994 Nov 03



Although compact telescopes are convenient, they suffer from internal reflections and the focal plane is curved!





A good fluorite or APO refractor works best for Solar Eclipse Imaging.

2008 Aug 01 - Jinta, CHINA

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India's Total Solar Eclipse of 1995 Oct 24

**DO NOT use Barlows or Tele-Converters!
They can produce internal reflections.**

AstroPhysics Traveler APO Refractor

AstroPhysics Traveler Refractor + AP 2x Barlow

1995 Oct 24 - Dunlod, India

India's Total Solar Eclipse of 1995 Oct 24

**Take Eclipse SELFIES!
Use wide angle & fisheye lenses!**

16mm Full Frame Fisheye Lens

1995 Oct 24 - Dunlod, India



India's Total Solar Eclipse of 1995 Oct 24




Take shots of PEOPLE
before, during & after the eclipse.

1995 Oct 24 - Dunlod, India



1999 Total Solar Eclipse Elazig, Turkey

**Use Intervalometers to
Automate Eclipse Photography!**



Nikon N8008 SLR with
Program Back
(Timer/Intervalometer)

What if your camera doesn't have a built in Intervalometer (Time-Lapse) function?



Search Amazon for: "digital timer remote"

NEEWER Digital Timer Shutter Release Trigger Remote

Automated Eclipse Photography using a Laptop PC

- 1) *Eclipse Orchestrator for Windows PCs***
(Moonglow Technologies / Fred Bruenjes)
- 2) *Solar Eclipse Maestro for Mac OS X***
(Xavier Jubier)
- 3) *UmbraphileX for Mac OS X***
(Glenn Schneider)

Support these products with a
Donation/Contribution/Purchase!

- 2) *Eliminate Human Error / Brain Freeze***
- 3) *Frees you to watch TOTALITY!***
- 4) *Murphy's Law (more to bring & set up)***

Vixen Fluorite Refractor + Nikon DSLR



Use Equatorial Mount for Tracking the Sun

2006 Mar 29 -
Jalu, LIBYA

Shoot in Camera RAW!

Test DSLR/Memory Card combo to
characterize FULL BUFFER limits!

TSE2006 - Corona Exposure Sequence



TSE2006-1098.JPG



TSE2006-1100.JPG



TSE2006-1102.JPG



TSE2006-1104.JPG



Shoot bracketed exposures to capture the inner, middle and outer corona!



TSE2006-1116.JPG




TSE2006-1118.JPG

1/500 to
2 seconds
F/9 @ ISO 200



TSE2006-1114.JPG

Learn how to combine exposures to produce
HDR (High Dynamic Range) composites.



"Great Imaging Tools for Eclipse Chasers",
Sean Walker, Sky & Telescope, 2009 June.

"Lessons from the Masters: Current Concepts in
Astronomical Image Processing", Robert Gendler.

USA's Partial Solar Eclipse of 2000 Dec 25



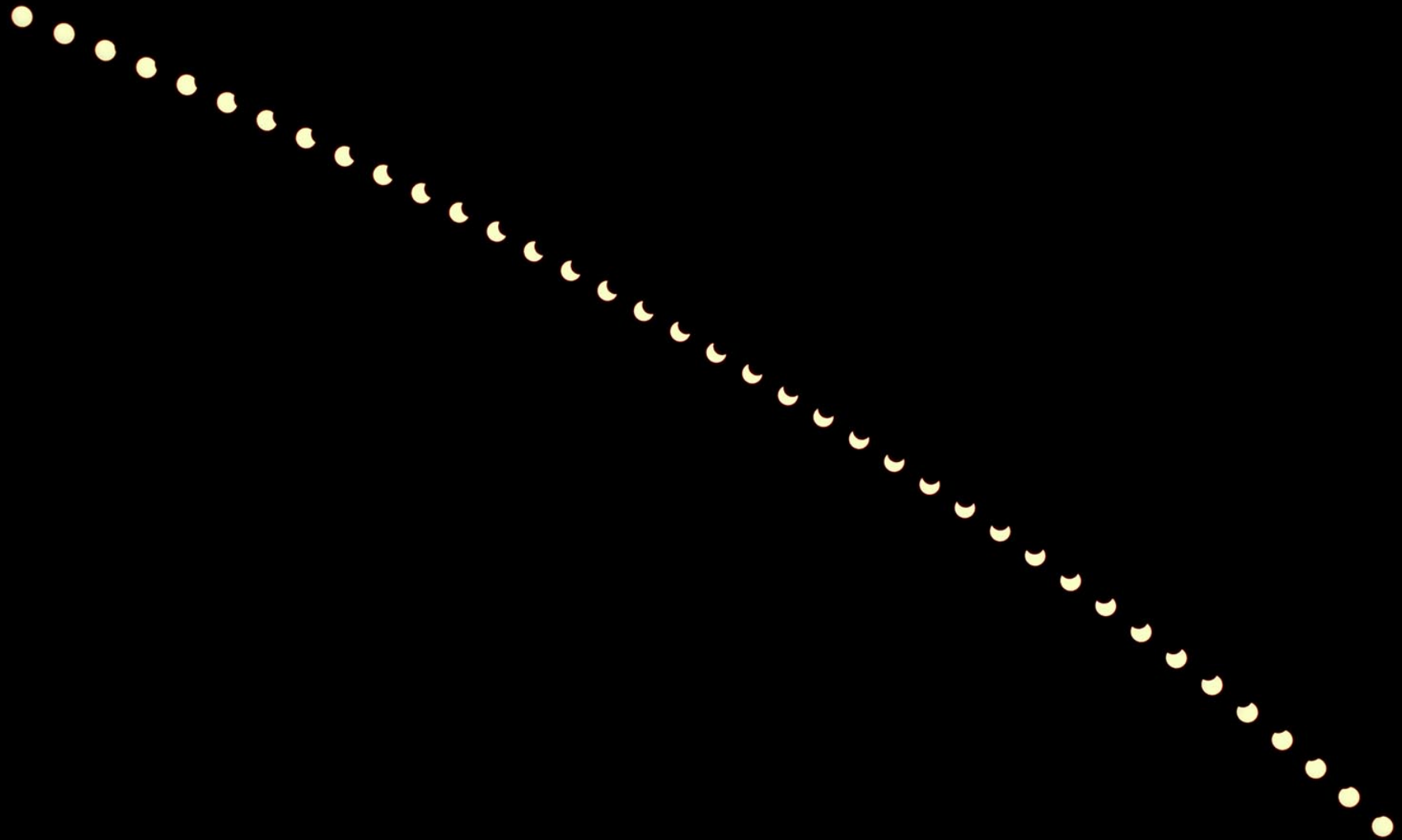
Holgate, NJ

USA's Partial Solar Eclipse of 2000 Dec 25



Holgate, NJ

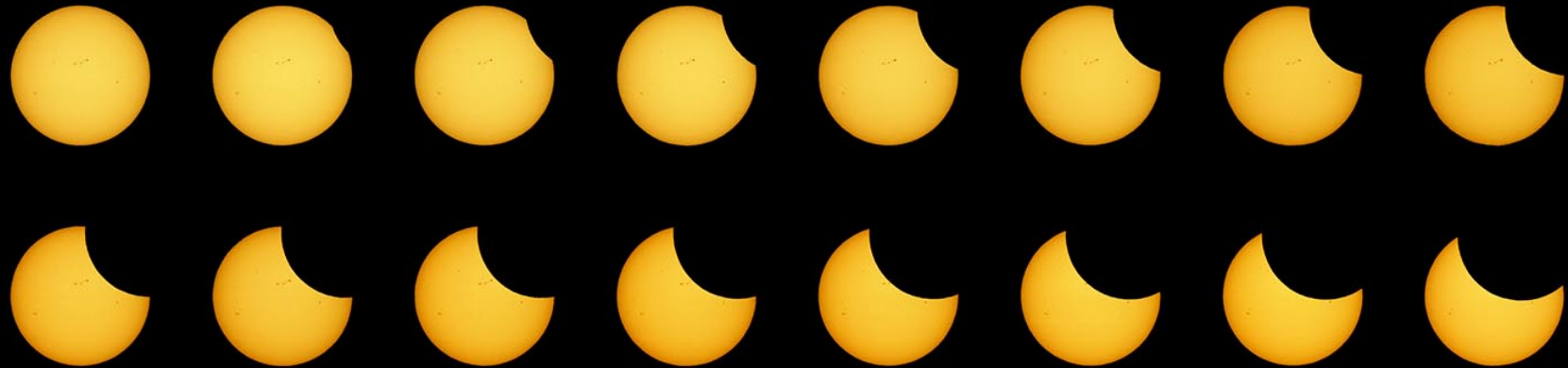
USA's Partial Solar Eclipse of 2000 Dec 25



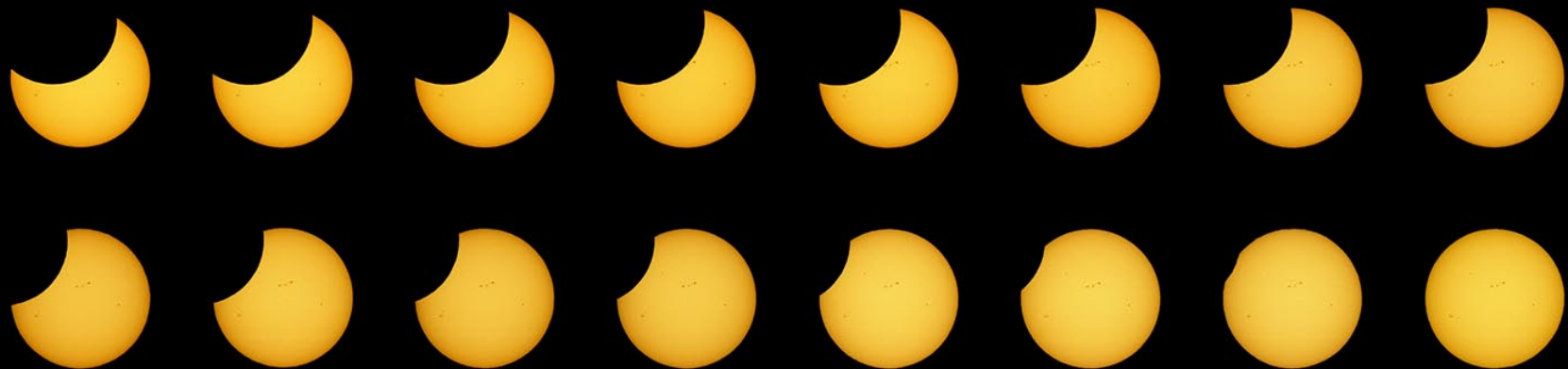
Timed Image Sequence

Holgate, NJ

USA's Partial Solar Eclipse of 2000 Dec 25



Partials offer the chance to try new or novel compositions, techniques or ideas!



Partial Solar Eclipse – 2000 Jul 30



Consider traveling for Partial Eclipses!

Spokane, WA

Partial Solar Eclipse in Oahu – 2004 Oct 23



Partial Solar Eclipse in Oahu – 2004 Oct 23



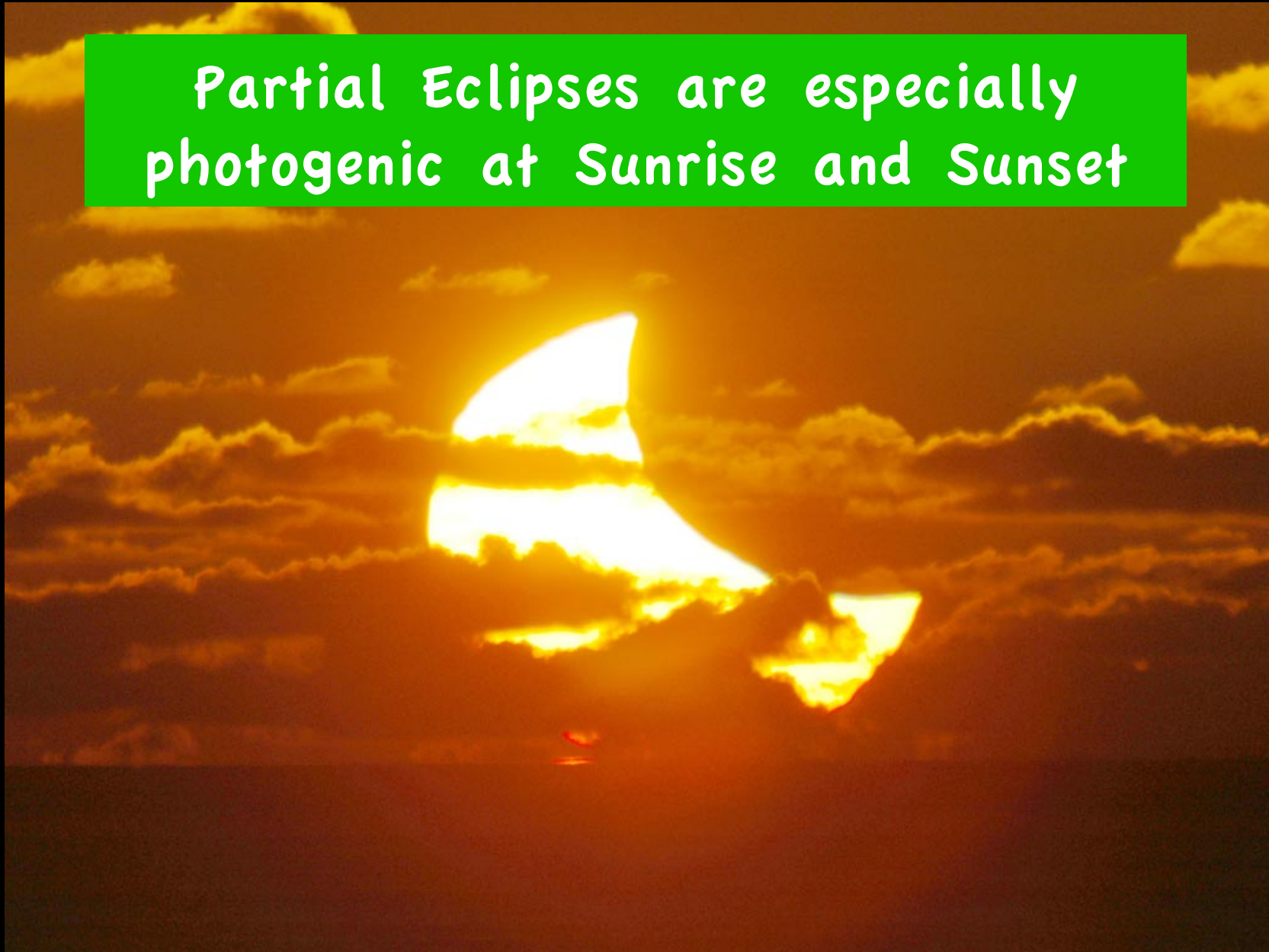
"Mr. Peanuts"
Solar Filter

Partial Solar Eclipse in Oahu – 2004 Oct 23

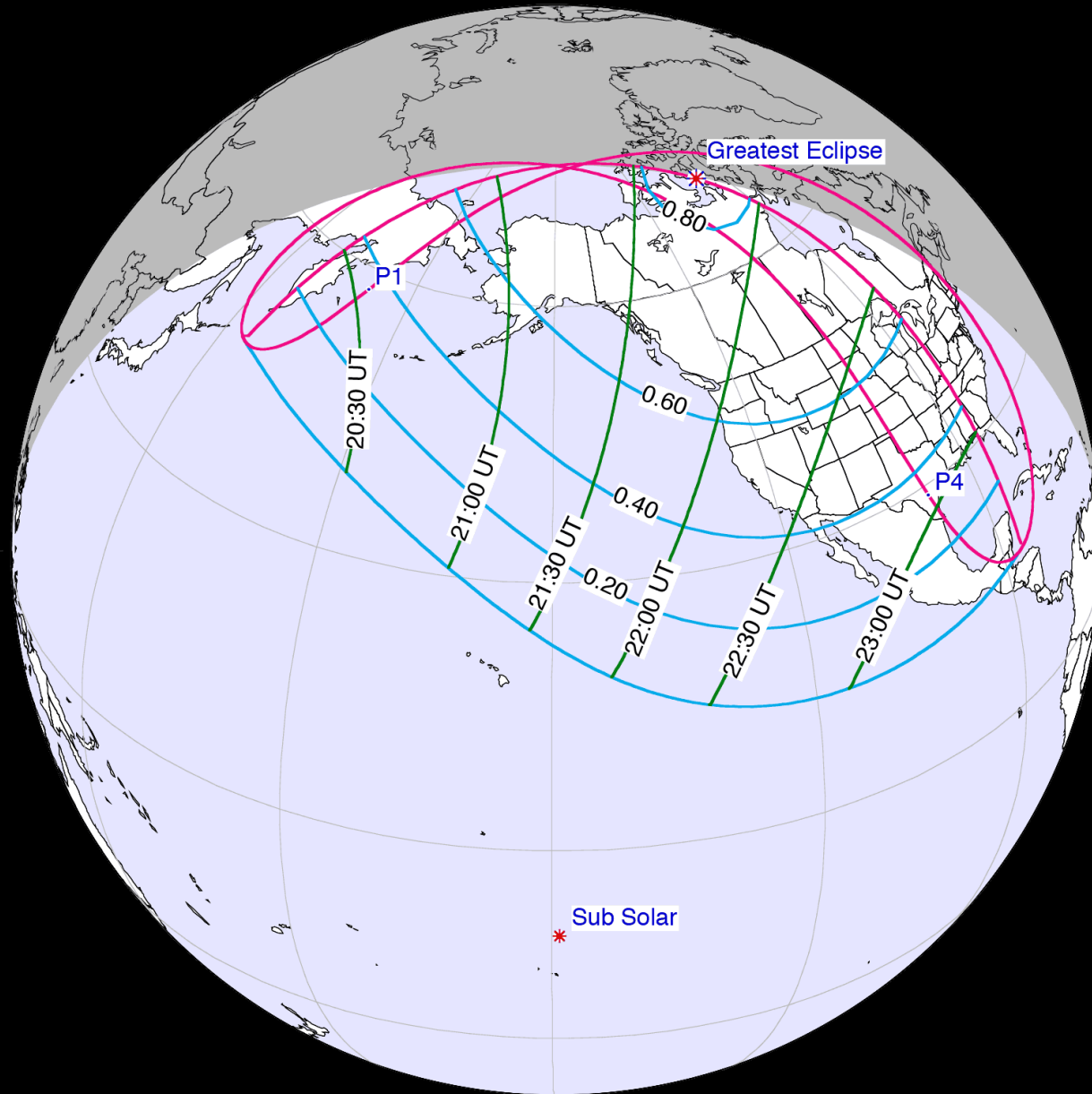


Partial Solar Eclipse in Oahu – 2004 Oct 23

Partial Eclipses are especially photogenic at Sunrise and Sunset

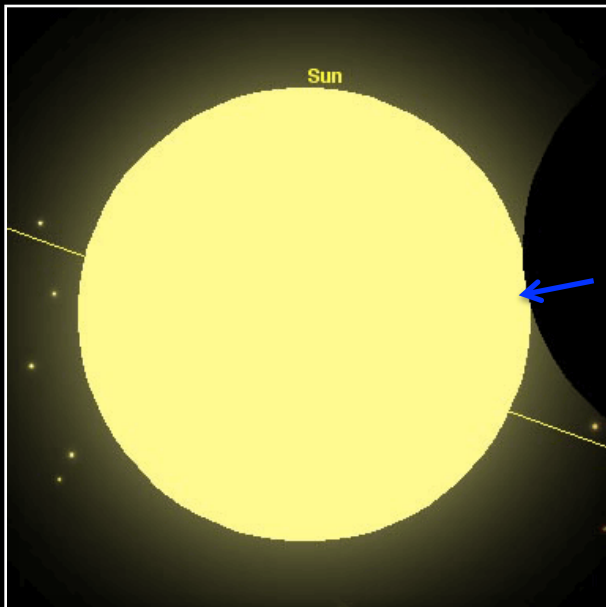


Partial Solar Eclipse of 2014 Oct 23



USA's Partial Solar Eclipse of 2014 Oct 23

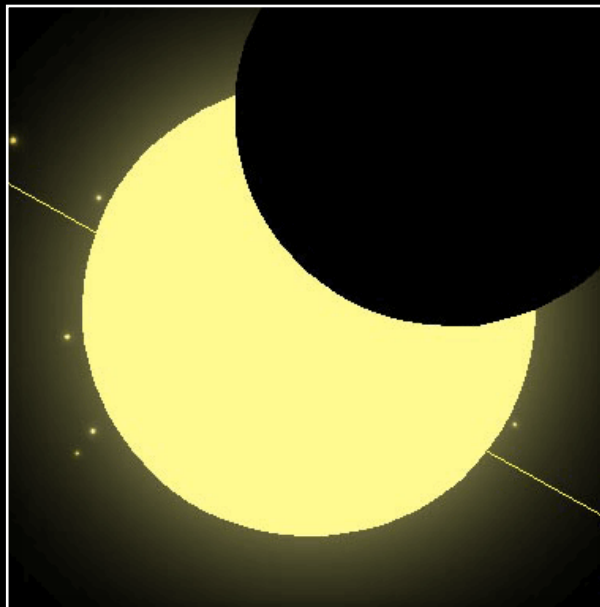
Partial Begins



21:34:20 UTC
(15:34:20 MDT)

Alt = 30.4°
Azm = 229.1°

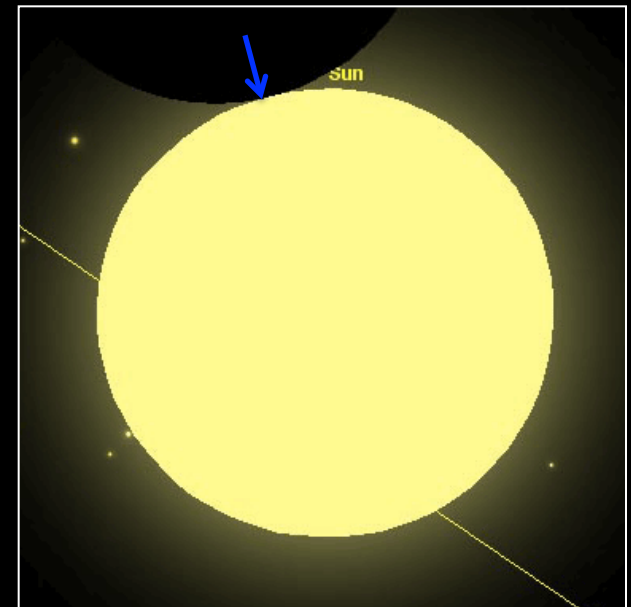
Maximum Eclipse



22:45:44 UTC
(16:45:44 MDT)

Alt = 18.0°
Azm = 242.6°

Eclipse Ends



23:49:10 UTC
(17:49:10 MDT)

Alt = 5.7°
Azm = 252.3°

Magnitude = 0.434

Eclipse Photography



www.MrEclipse.com

Ultimate Eclipse Photography