



# NightScapes

## Dark Sky Festival

Sequoia and Kings Canyon National Parks  
July 25-27, 2014

Alex McConahay

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Riverside Astronomical Society

[Rivastro.org](http://Rivastro.org)

Alex McConahay, Sequoia Wuksachi

# What is a NightScape?

## ◉ The World at Night twanight.org

...a **program** to create and exhibit a collection of stunning landscape [images] of the world's most beautiful and historic sites against a nighttime backdrop of stars, planets and celestial events.

...a **bridge** between art, humanity, and science.



Alex McConahay, Sequoia Wuksachi



# What is a NightScape?

## ◉ The World at Night Images

- Outdoors at night
- Earthly foreground
- Celestial background
- Visually appealing
- Proper exposure and focus

...a **single exposure** (or stitched panorama)  
...are processed, but **not composited / not stacked**.

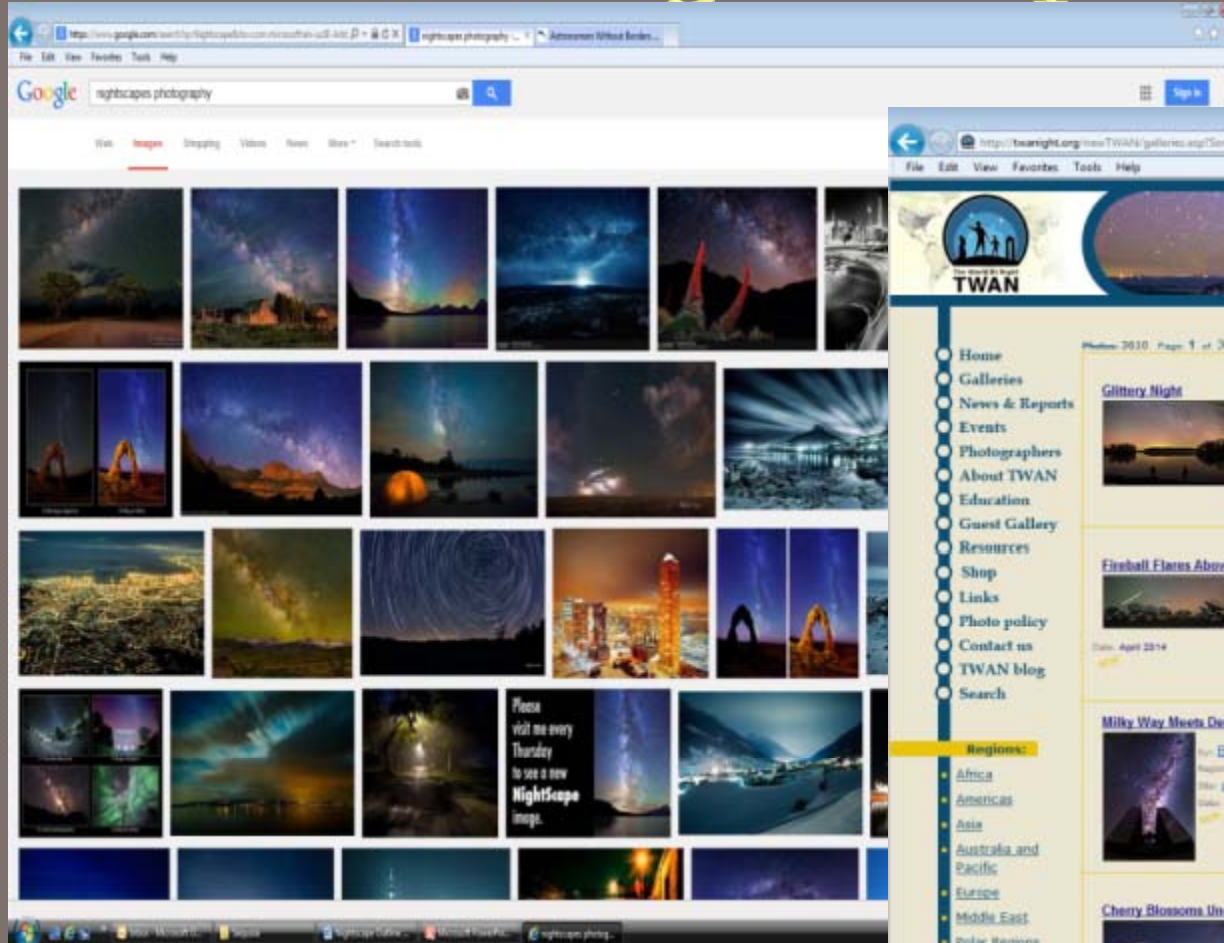
(TWAN does not use the term “NightScapes”  
—It just has the best examples of it.)



Alex McConahay, Camp Oakes

# NightScape Examples

Visit “[twanight.org](http://twanight.org)”



Google “NightScape Photography”  
.....and click on “Images”





# For Our Purposes

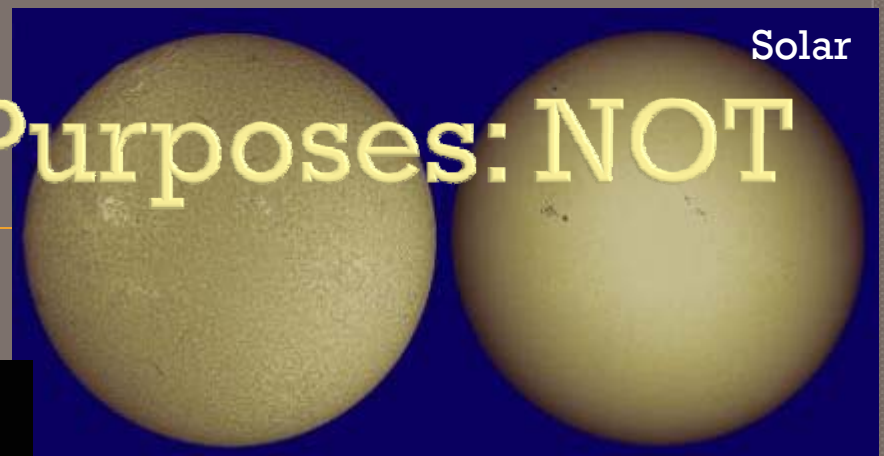
- ◉ Single Exposure
- ◉ Dark Sky
- ◉ Natural Earthly Foreground
- ◉ Consumer Grade DSLR's
- ◉ Minimal Equipment
- ◉ Existing / Free Software



# For Our Purposes: NOT



Deep Space



Solar



Aurora



Lunar



Eclipse



Moviemaking



Star Trails

Daniel Perry, Julian

***Today is only stuff you have, and things you can learn in an hour.***



# The Challenge

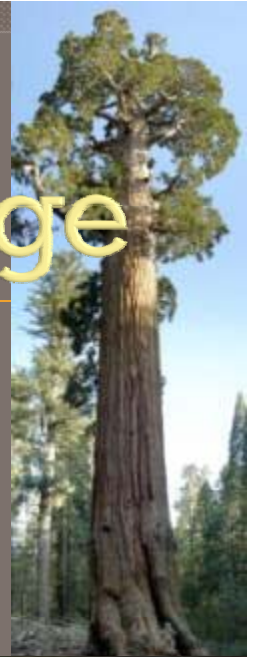
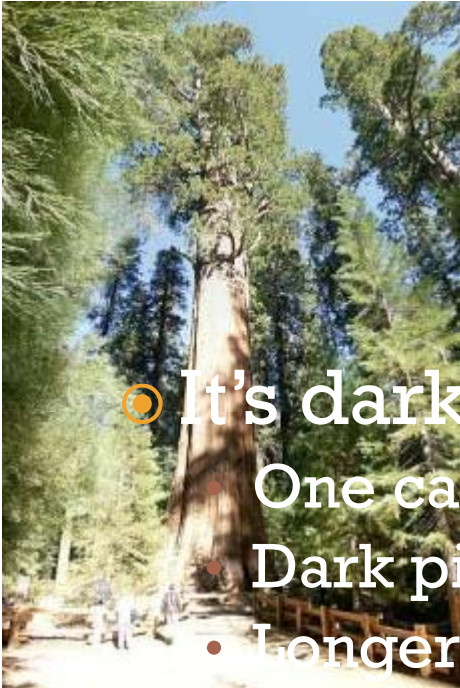
## ◉ It's dark

- One cannot see what one is photographing
- Dark pictures require longer exposures
- Longer exposures require more stability
- Dark pictures are “noisy”
- Longer pictures are “noisy”

## ◉ The subject is moving

- Stars leave streaks
- The wind blows trees

## ◉ The subject will not arrange itself



George A. Healey, The Peacemakers



# The Promise

You can take a picture

**TONIGHT**

that will

**WOW**

your church group,  
your secretary,  
your boyfriend,  
your ...

Mark Melnyk, Bristlecone Pine Forest



# Equipment

## ○ Camera and Lens

- Focus
- Timed Exposure



# Equipment

## ○ Camera and Lens

- Field of View (Coverage)
  - 18mm-72° x 48°
  - 55mm-23° x 16°
- Aperture
  - Smaller number is wider
- Zoom or Fixed
  - Image Quality
  - Refocus as zoomed?
- Lens Hood
- No Filter (1A, UV, etc)





# Equipment

- Tripod
- Alternatives
  - Fencepost/Rock
  - Beanbag
- Stable and Controllable



# Equipment

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## ◉ Remote Release (or Timer)





# Equipment

## Other Stuff--Camera

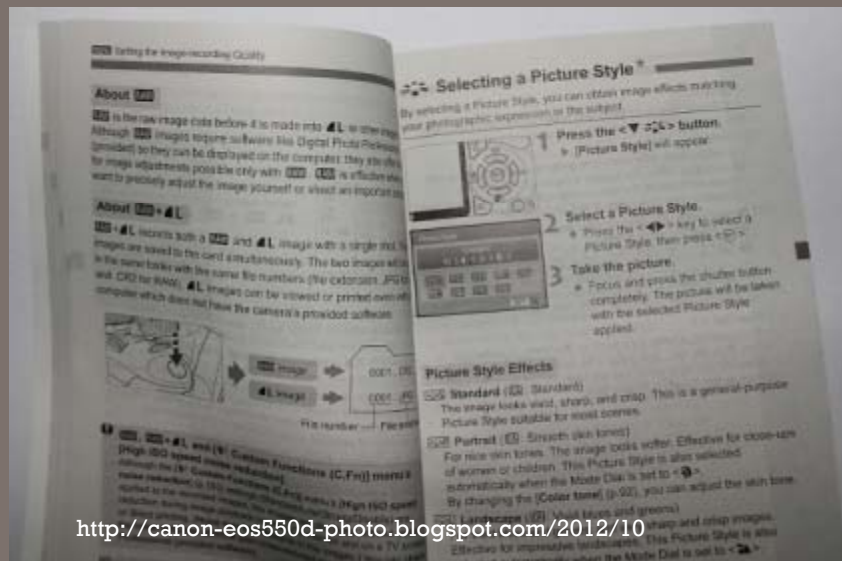
- Memory Card(s)
- Battery (ies)
- Loupe/Magnifying glass
- CAMERA MANUAL!!!!



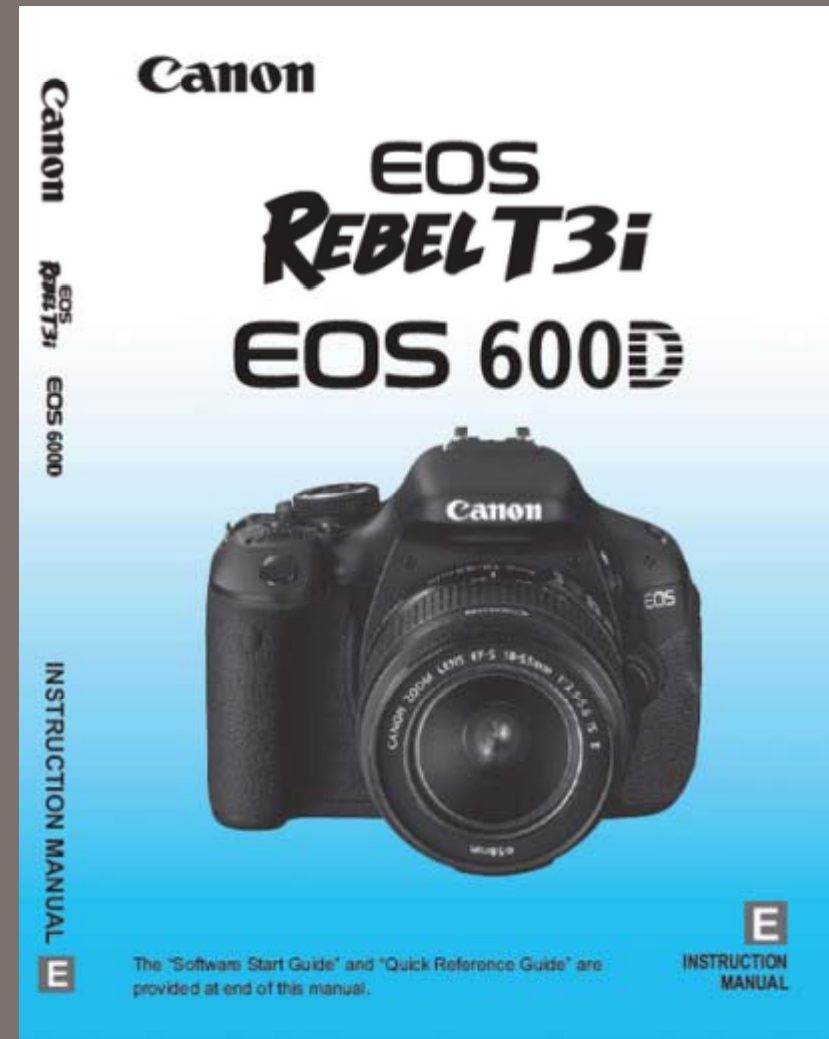
# Equipment

## Other Stuff--Camera

- Memory Card(s)
- Battery (ies)
- Loupe/Magnifying glass
- CAMERA MANUAL!!!!



<http://canon-eos550d-photo.blogspot.com/2012/10>





# Equipment

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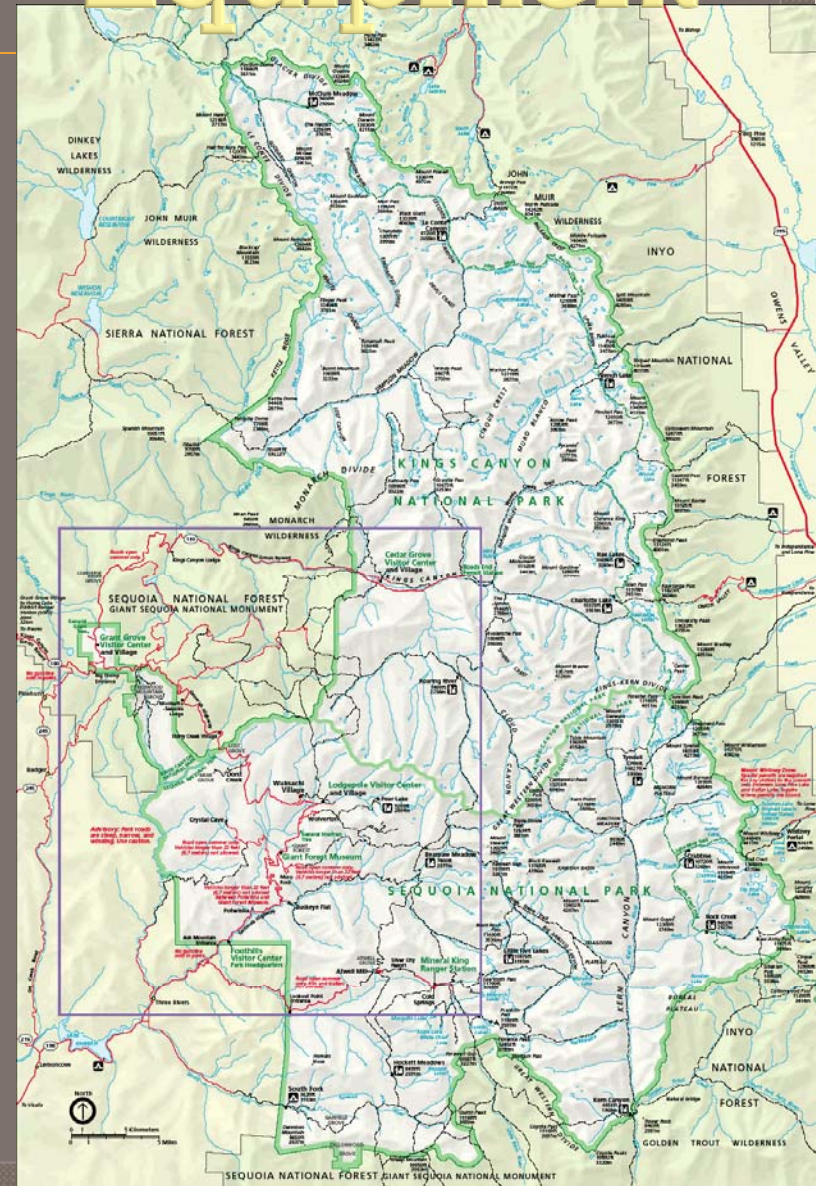
## ◉ Other Stuff--Comfort

- Red and white flashlights
- Warm Clothes
- Bug and Bear repellent, etc.
- Thermos/Munchies
- RV

# Equipment

## Other Stuff--Research

- Maps
- Planetarium Ap
- Compass





# Equipment

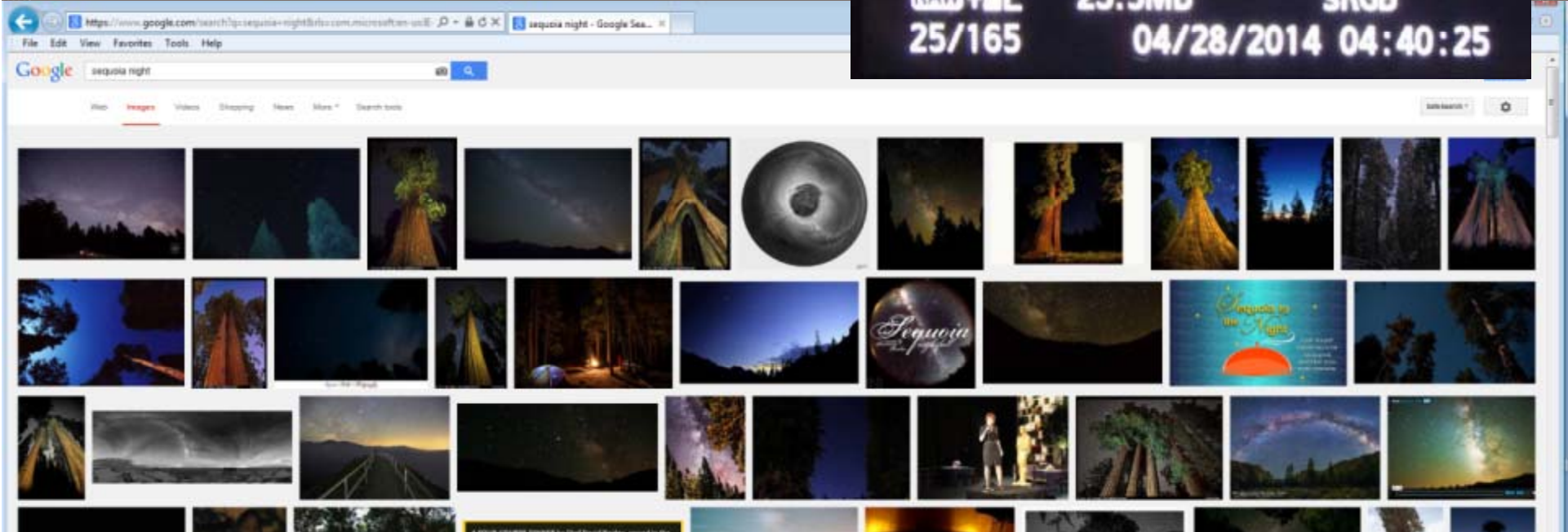
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## ◉ How to Pack

- Set it all up and try it out during the day/at home
- Put it all in a big box
- Don't leave home without the box!
- Or Make a list

# Pre Planning

- Start at home
- Know your camera
  - Settings menu
  - Info on Review screen
- Ideas for pictures
- Best time
  - Year/Month/Night



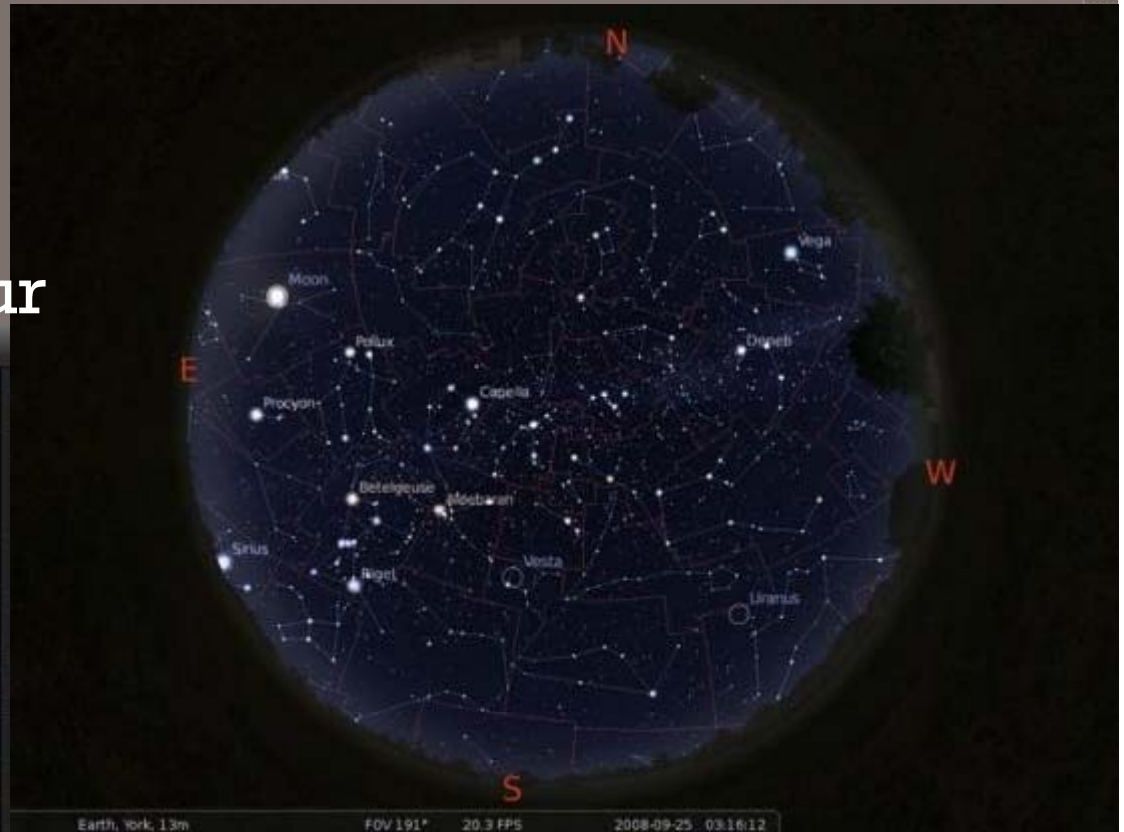


# Pre Planning

- ◉ Planetarium App
  - Azimuth
  - Altitude—15°/hour
  - Rise
  - Set
  - Transit

Search	
Basic Information	
Name	Andromeda Galaxy
Catalog Numbers	Messier 31 NGC 224 UGC 454 PGC 2557 MCG 7-2-16 CGCG 535-17
Description	Spiral Galaxy in Andromeda
Visual Magnitude	+3.36
Apparent Size	177.6 x 69.2 arcmin
Coordinates and Visibility	
R.A. (2010.8)	00h 43m 20.73s
Dec. (2010.8)	+41° 19' 45.7"
Azimuth	040° 08' 00.1" in the northeast
Altitude	+05° 39' 37.7" above horizon
Rise	03:57:57 PM
Transit	12:57:31 AM
Set	09:53:08 AM
Physical Parameters	
Color Index	+0.92
Morphology	Sb, spiral
Radial Velocity	-290.0 km/sec
Absolute Mag.	-21.09 visual
Diameter	46.2 kpc, 131.3 kly

Skysafari Phone App



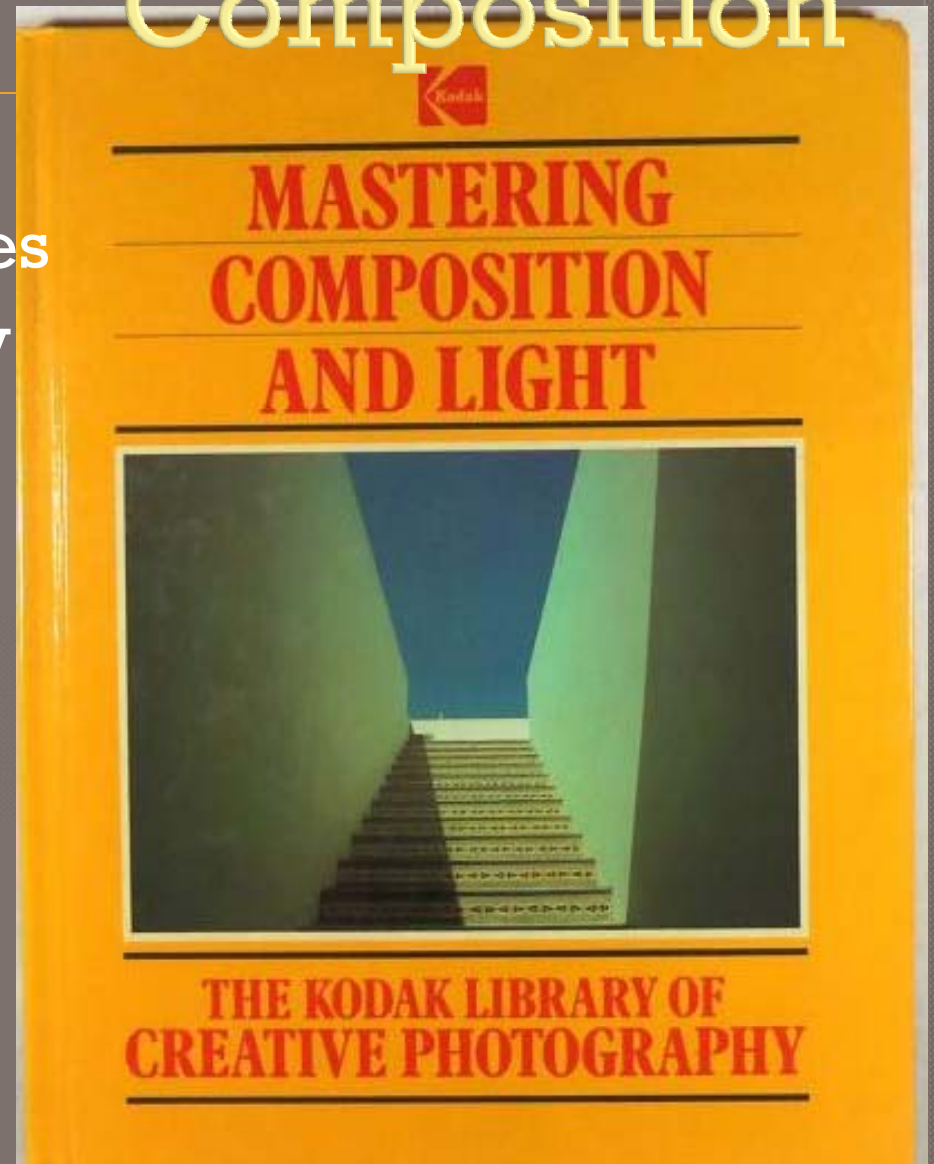
Stellarium.org

# Composition

- Subject
- S Curves and Dynamic Lines
- Horizontal Line Asymmetry
- Mirroring
- Perspective

## Kodak's Elements of Composition

- Simplicity
- Lines
- Framing
- Rule of Thirds
- Balance
- Avoiding Mergers

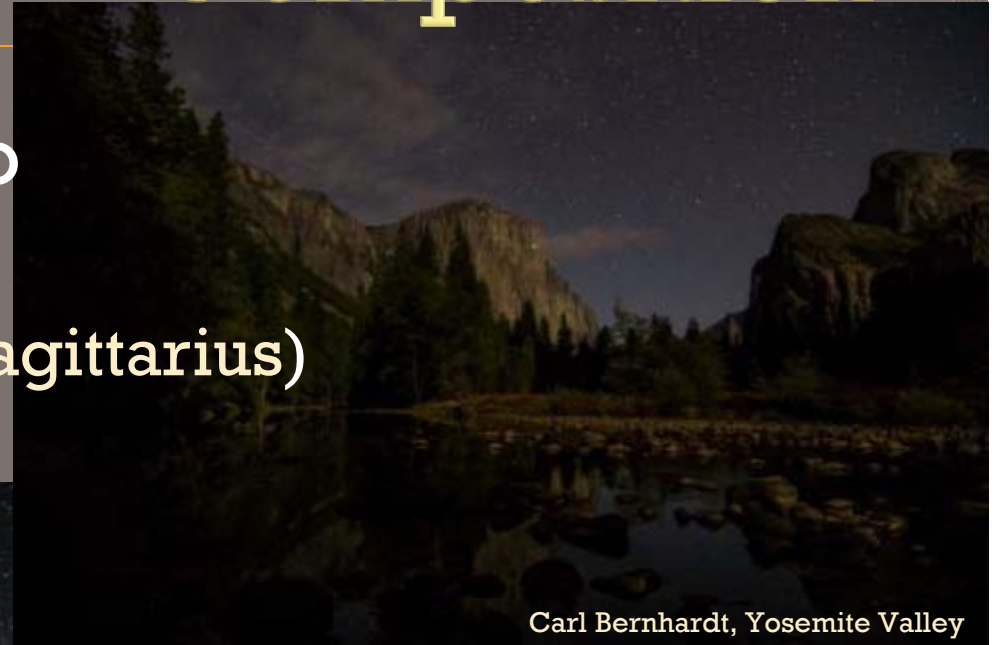




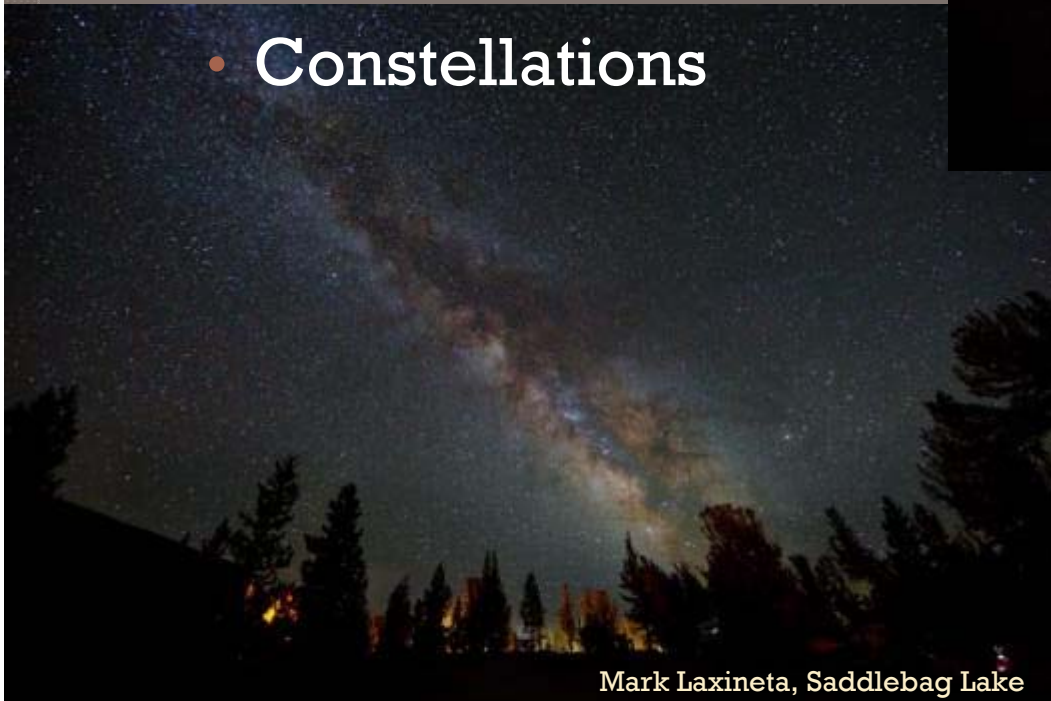
# Composition

## ◉ Subject of the Photo

- Foreground
- Milky Way (Scutum-Sagittarius)
- Moon/Planets
- Constellations



Carl Bernhardt, Yosemite Valley



Mark Laxineta, Saddlebag Lake

# Composition

## ◉ Subject of the Photo

- Foreground
- Milky Way (Scutum-Sagittarius)
- Moon/Planets
- Constellations



Alex McConahay, Sequoia Big Dipper



John Rhodes, GMARS



John Rhodes, GMARS



# Composition

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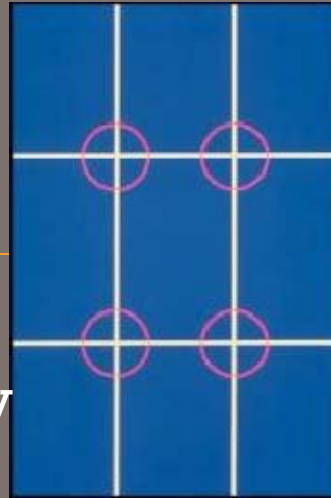
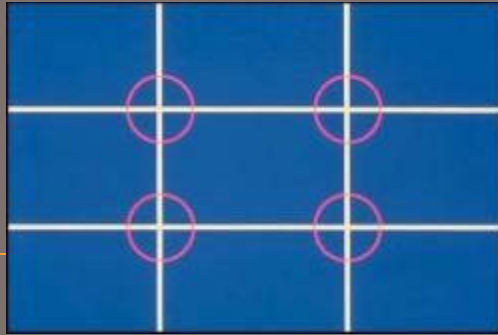
- S Curves and Dynamic Lines



Robert Stephens, Cerro Tololo



Alex McConahay, GMARS Observatory



# Composition

- Horizontal Line Asymmetry
- Mirroring



Daniel Perry, Waimea Canyon



Carl Bernhardt, Lake Tenaya



# Composition

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## ○ Perspective

- Horizontal AND Vertical
- Slight change in location





# Lighting

- ◉ Moon
- ◉ Silhouette/Highlight
- ◉ Painting



Carl Bernhardt, Tunnel View Full Moon



Alex McConahay, Tunnel View



Alex McConahay, Rainbow Canyon

# Lighting

- Moon
- Silhouette/Highlight
- Painting



Alex McConahay, Sequoia Potwisha



Alex McConahay, Orion Setting, Palmyra, Syria



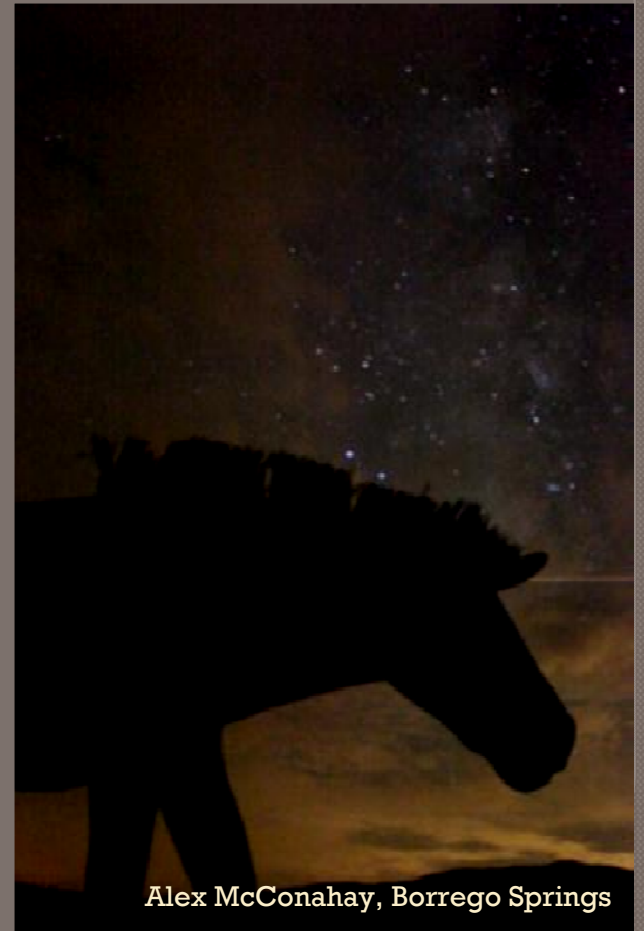
Daniel Perry, Zion

# Lighting

- ◉ Moon
- ◉ Silhouette/Highlight
- ◉ Painting



Alex McConahay, Borrego Springs



Alex McConahay, Borrego Springs



# The Expedition

- ◉ Charging
- ◉ Packing
- ◉ Scout--Walk the shot with
  - Planetarium Ap
  - Compass
  - Camera

# Pre-Focus

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- ◉ Pre-mark Focus (Daytime)
  - Focus on distant bright object
  - Live View/Magnified Live View/
  - Live View with loupe
- ◉ Test exposure
- ◉ White ink (White-out)
- ◉ Tape/double check



# Camera Pre Settings

- Camera Custom Functions
  - Mirror Lockup (no?)
  - Long Exposure Noise Reduction (yes?)
  - High ISO Noise Reduction (yes?)
- LCD Brightness (Dimmer)
- Auto Off (eight minutes +)
- Review time (four seconds +)
- Picture Quality/File Type (RAW + Large)
- White Balance (Tungsten—3400-4400)
- Function Dial (Manual)
- Image Stabilizer (off)
- Auto Focus (off)
- Set Self-timer to 2 seconds (Or use remote release)
- Lens Hood On, Filters Off

*How to set it all? It's in the Manual.....*





# Camera Pre Settings

## Camera Custom Functions

- Mirror Lockup (no?)
- Long Exposure Noise Reduction (yes?)
- High ISO Noise Reduction (yes?)

## LCD Brightness (Dimmer)

## Auto Off (eight minutes +)

## Review time (four seconds +)

## Picture Quality/File Type (RAW + Large)

## White Balance (Tungsten—3400)

## Function Dial (Manual)

## Image Stabilizer (off)

## Auto Focus (off)

## Set Self-timer to 2 seconds (or 10)

## Lens Hood On, Filters Off

## Nightsapes Checklist

### Setup

Camera Custom Functions and Presets  
 Learn Infrared Focus position  
 Mirror Lockup (no?)  
 Long Exposure Noise Reduction (yes?)  
 High ISO Noise Reduction (yes?)  
 LCD Brightness (Dimmer)  
 Auto Off (eight minutes +)  
 Review time (four seconds +)  
 Picture Quality/File Type (RAW + Large)  
 White Balance (Tungsten—3400-4400)  
 Function Dial (Manual)  
 Image Stabilizer (off)  
 Auto Focus (off)  
 Lens Hood (yes), Filter, (no)  
 Set Self-timer to 2 seconds or program remote release)  
 Mount Camera  
 Lock everything that can be locked on tripod  
 Tie down straps, remote, etc.

### Taking an Image

Check Setup  
 Focus  
 Aim at bright star (anywhere in sky)  
 Wide Angle/viewfinder/center and focus  
 Tele Angle/viewfinder/center  
 Imaging Zoom Setting/Live/View-LCD Screen/Loupe  
 Find star/Position/Magnify Box,  
 Magnify by 10  
 Focus Manually  
 Remove color fringe  
 Test Image (Composition)  
 Aim at subject  
 Shutter at 10 seconds (more if needed)  
 Widest aperture (F smallest possible number)  
 Highest ISO available (6400/12800 is OK)  
 Take and Evaluate Image  
 composition  
 sweep corners

less aberrations at full aperture  
 fill frame  
 local lights/distractions, etc.  
 Adjust/Repeat until happy  
 Lock Tripod  
 Test Image (Exposure)  
 Apply "Rule of 100" for shutter time  
 Exposure time=200/focal length  
 Widest aperture (F smallest possible number)  
 ISO 800  
 Evaluate Image  
 Histogram—one third across  
 Star shapes—magnify and check corners  
 Adjust ISO higher if possible  
 Adjust/Repeat until happy

### Final Shots

Set self timer or remote release.  
 Take several images at any given setting  
 Do both Horizontal and Vertical Alignment  
 Vary ISO/Time/Aperature as you like  
 Take Notes  
 For Every Exposure:  
 Take a deep breath  
 Press shutter/remote button  
 Wait for self timer (if no remote)  
 Wait for shutter  
 Wait for "ICNR" time if used  
 Review  
 Light Painting (Highlight foreground)  
 Diffused Flashlight (or Cellphone)  
 Wave and move around to avoid harsh shadows  
 Experiment

### Processing

Do Not Work on Originals  
 File Explorer or Image Viewer  
 Fix  
 Move sliders to make pleasant picture  
 Change Exposure, Color Balance, etc.

*These suggestions are for those just starting in Nightscape photography with basic equipment and experience.  
 Experiment and change as you get comfortable.*



## Resources

Web: The World At Night [worldatnight.org](http://worldatnight.org)  
 Web: Wally Pacholka [astrophoto.com](http://astrophoto.com)

Web: Any Search Engine for Nightscape Photography  
 Classes: [danielmanning.com](http://danielmanning.com)

Print: Photography: Night Sky, Jennifer Wu/James Martin, Mountaineer Books  
 Good People: Riverside Astronomical Society [rrasrvo.org](http://rrasrvo.org)

Software: Helicon Filter [heliconsoft.com](http://heliconsoft.com) (and many others)  
 Presenter: Alex McCool [alexmccool@yahoo.com](mailto:alexmccool@yahoo.com)

*How to set it all? It's in the Manual.....*



# Camera Pre Settings

- Camera Custom Functions
  - Mirror Lockup (no?)
  - Long Exposure Noise Reduction (yes?)
  - High ISO Noise Reduction (yes?)
- LCD Brightness (Dimmer)
- Auto Off (eight minutes +)
- Review time (four seconds +)
- Picture Quality/File Type (RAW + Large)
- White Balance (Tungsten—3400-4400)
- Function Dial (Manual)
- Image Stabilizer (off)
- Auto Focus (off)
- Set Self-timer to 2 seconds (Or use remote release)
- Lens Hood On, Filters Off

*How to set it all? It's in the Manual.....*

# Exposure Tradeoffs



- ◉ Noise

- Time/Temperature/ISO

- ◉ Lens Quality/Aperture

- Wide open/aberrations

- ◉ Exposure Time/Star Shape

- The Rule of 200

- ◉ Exposure Latitude/Dynamic Range

- Dark background or foreground



# Take a Pic

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## ◉ Mount Camera

- Lock everything that can be locked on tripod
- Tie down straps, remote, etc.

## ◉ Check Settings

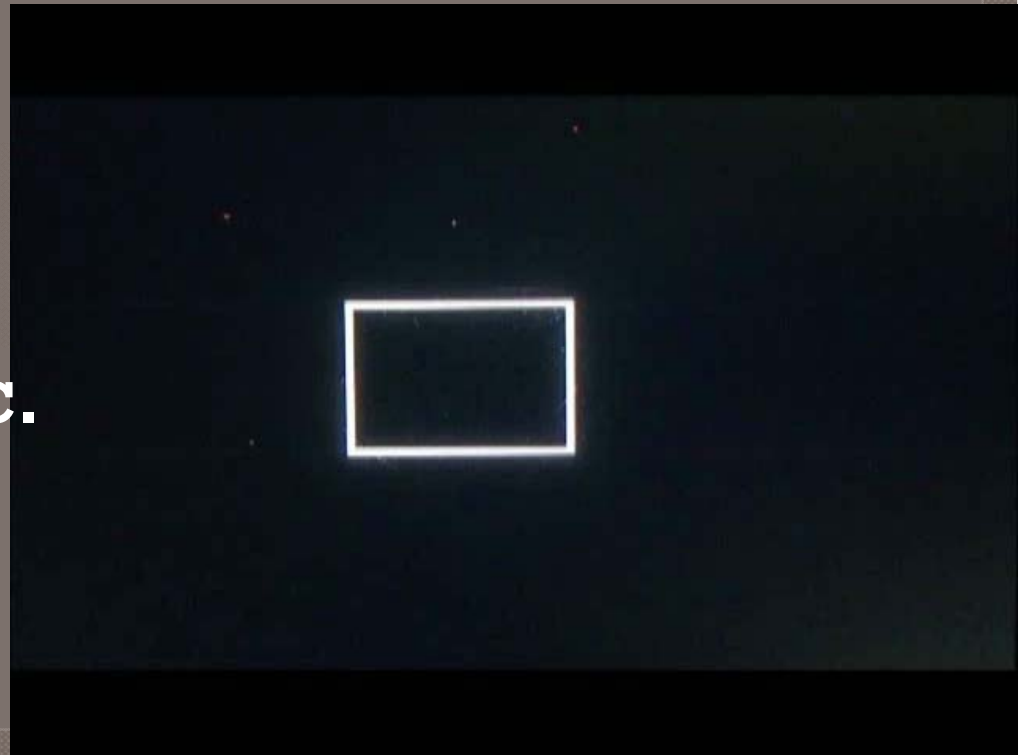
# Take a Pic

## ◎ Focus

- Aim at bright star (anywhere in sky)
- Wide Angle/viewfinder/center and focus
- Tele Angle/viewfinder/center
- Imaging Zoom Setting/LiveView-LCD Screen/Loupe
  - Find star/position Magnify box,
  - Magnify by 10
  - Focus Manually
- Remove color fringe

## ◎ Aim at subject

## ◎ Slip-Lock tripod, etc.



# Take a Pic

## ◉ Test Composition

- 10 seconds (more if needed)
- Widest aperture (F smallest possible number)
- Highest ISO available

## ◉ Evaluate Image

- composition
- sweep corners
- lens aberrations at full aperture
- fill frame
- offending local lights/distractions, etc.

## ◉ Adjust/Repeat until happy



# Take a Pic

- Test Exposure Settings
  - Apply “Rule of 200” for shutter time
    - Exposure time=200/focal length
  - Widest aperture (F smallest possible number)
  - ISO 800
- Evaluate Image
  - Histogram—one third across
  - Star shapes—magnify and move into corners
- Adjust ISO higher if possible
  - Ideal (?) ISO for advanced users/post process
  - Limited by noise
- Adjust/Repeat until happy
- Reset Composition/LOCK TRIPOD
- Set self timer or remote release.



# Imaging Session

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- Take several images at any given setting
- Do both Horizontal and Vertical Alignment
- Vary ISO/Time/Aperture as you like
- Take Notes
- For Every Exposure:
  - Take a deep breath
  - Press shutter/remote button
  - Wait for self timer (if no remote)
  - Wait for shutter
  - Wait for “ICNR” time if used
  - Review

# Imaging Session

## ◉ Highlight foreground

- Diffused Flashlight (or Cellphone)
- Notes on Color Balance
- Wave and move around to avoid harsh shadows
- Experiment



Alex McConahay, Joshua Tree Jumbo Rocks

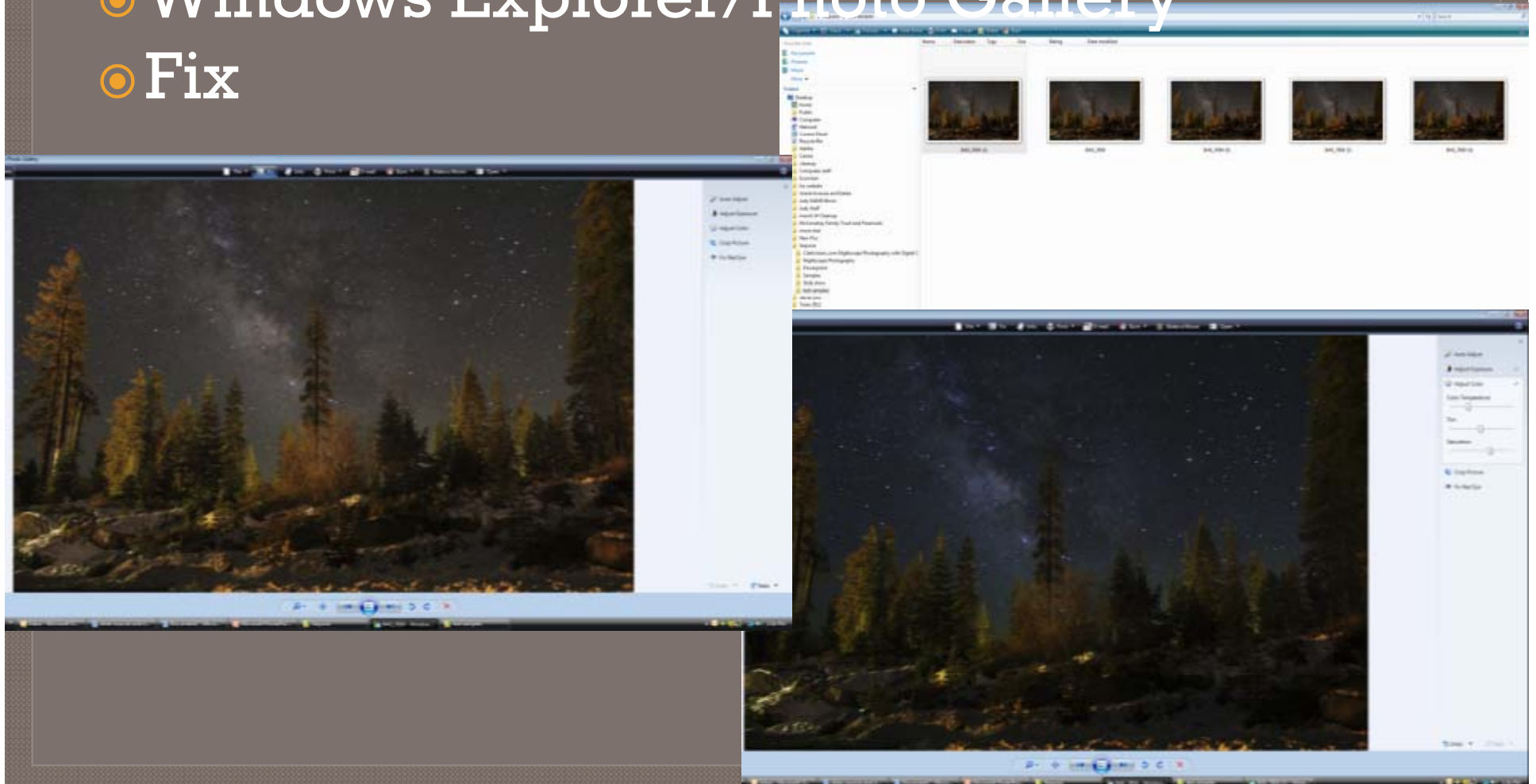


Alex McConahay, Joshua Tree Jumbo Rocks



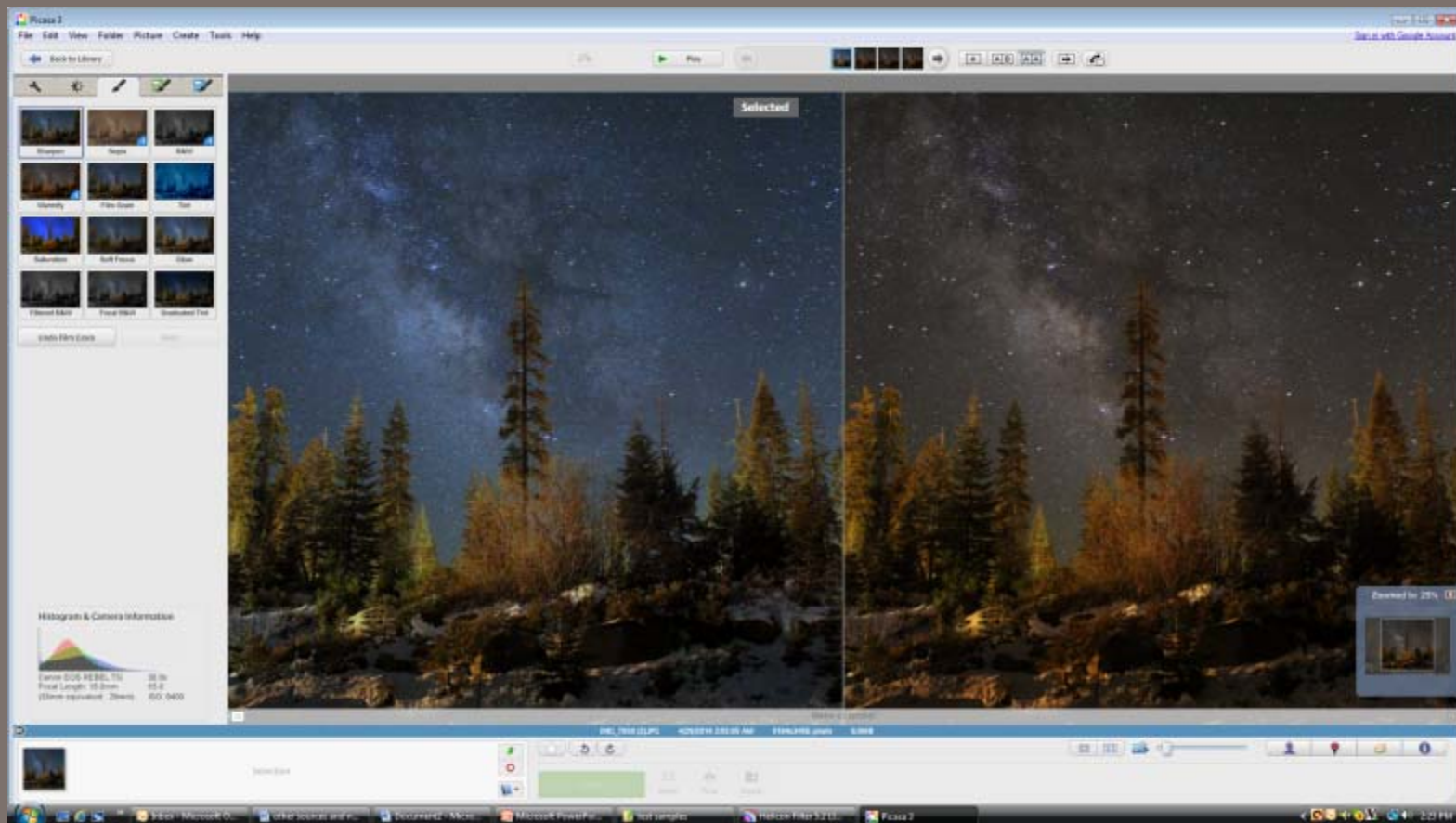
# Processing

- DO NOT WORK WITH ORIGINALS!!!
- Windows Explorer/Photo Gallery
- Fix



# Advanced Processing

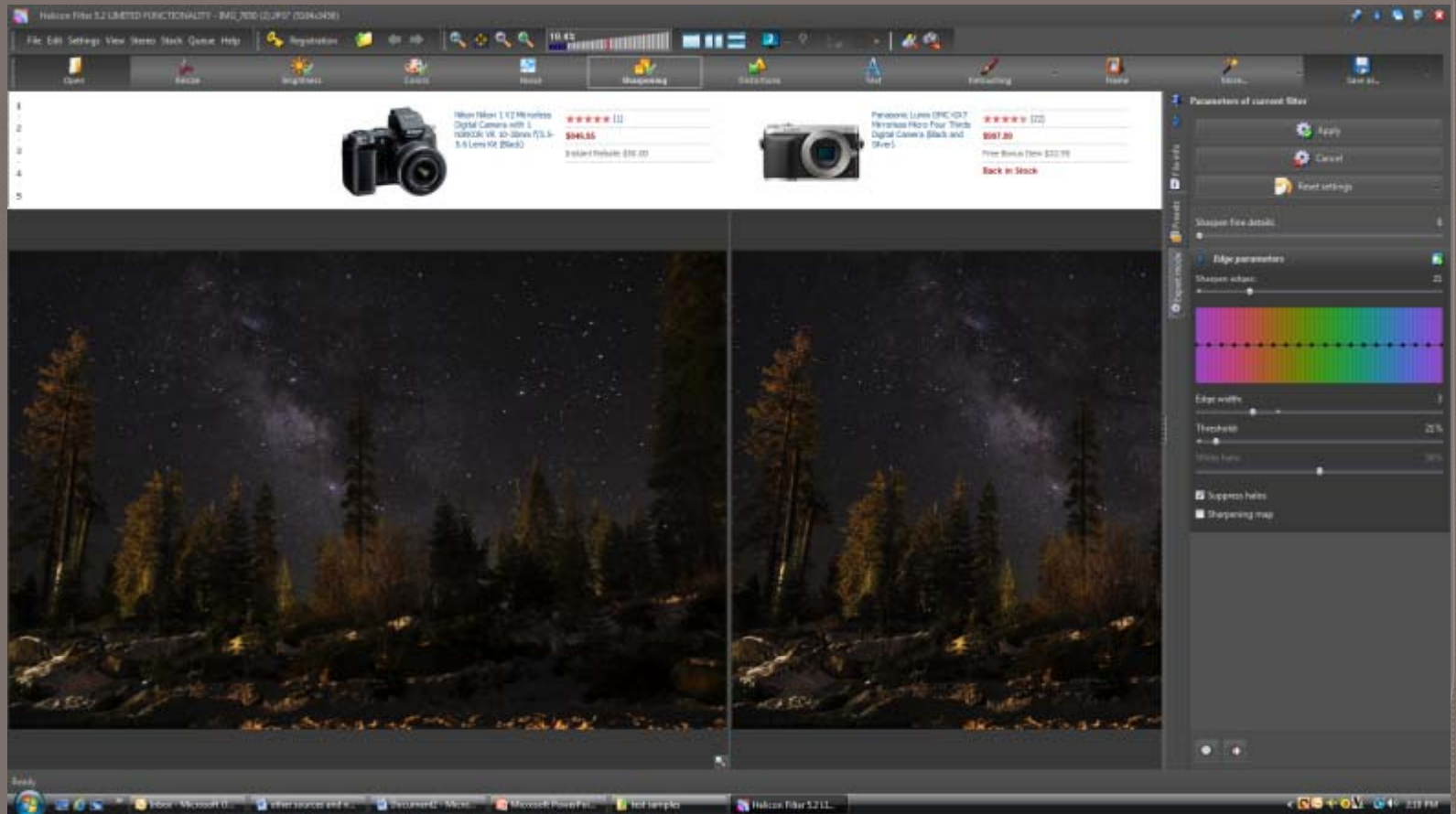
## ○ Picassa





# Advanced Processing

## ◉ Helicon Filter







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# For Our Purposes

## ○ NOT:

- Deep Space
- Lunar
- Solar
- Star Trails
- Aurora
- Eclipse
- Moviemaking





# For Our Purposes

---

## ○NOT:

- Deep Space
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- Aurora
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- Moviemaking



- And No Fancy Processing or Photoshop

*Stuff you have, and things you can learn in 45 minutes.*

# For Our Purposes

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- Aurora
- Eclipse
- Moviemaking

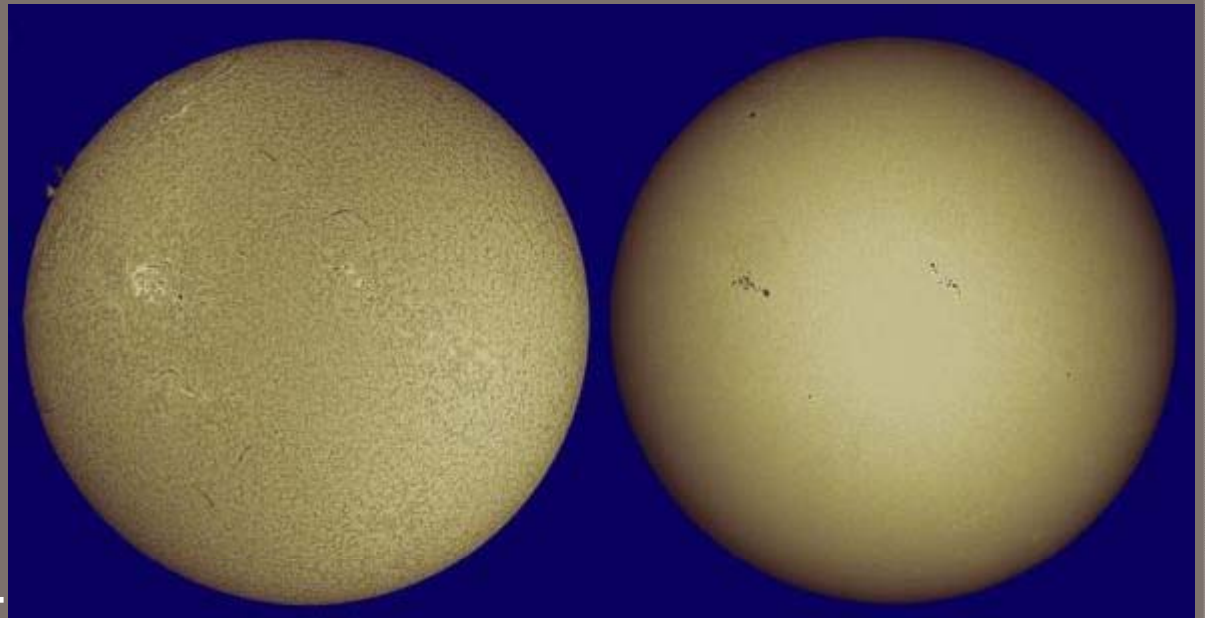


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# For Our Purposes

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## ◉ NOT:

- Deep Space
- Lunar
- Solar
- **Star Trails**
- Aurora
- Eclipse
- Moviemaking



Justin Sage

# For Our Purposes

## ◉ NOT:

- Deep Space
- Lunar
- Solar
- Star Trails
- **Aurora**
- Eclipse
- Moviemaking

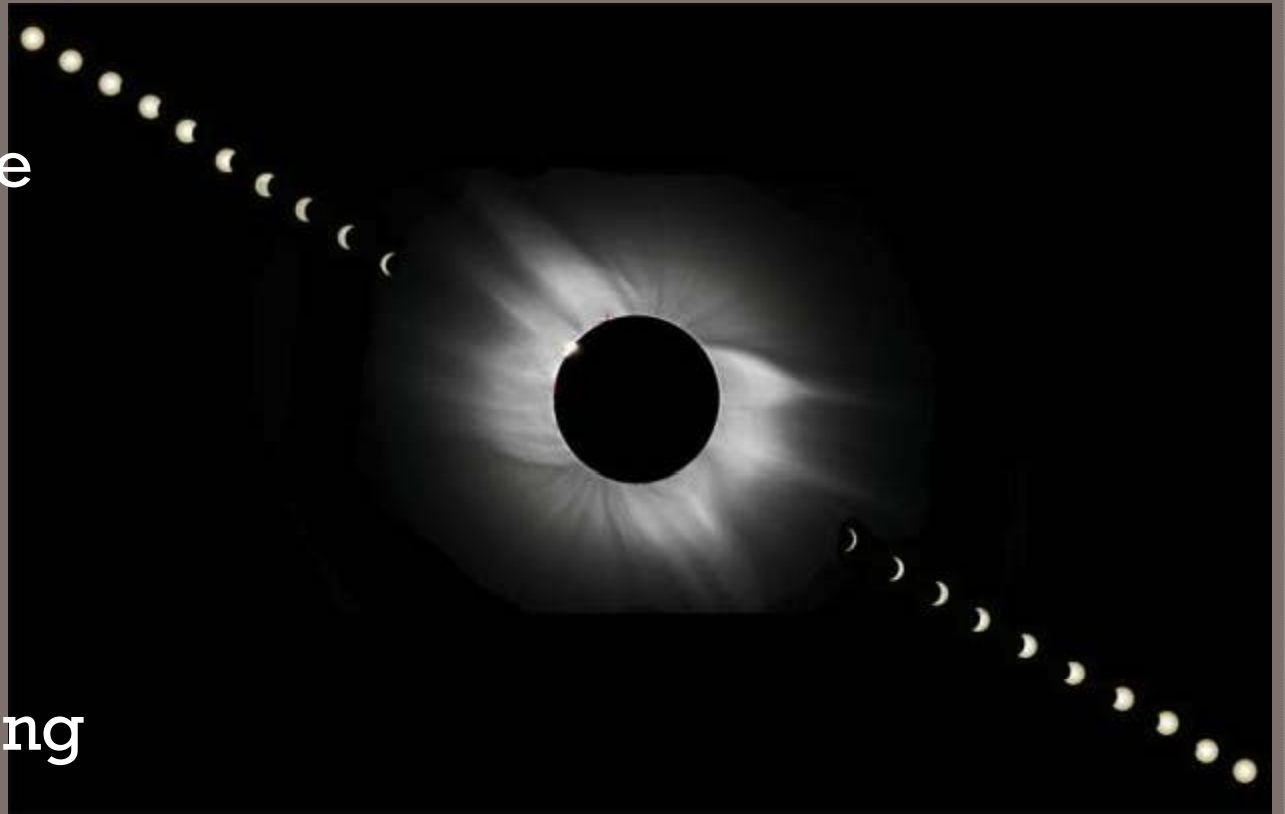


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# NightScape Examples

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Image slideshow.....