



NPSNZ Intro to Astrophotography Workshop

July 2022



What is Astrophotography?

Astrophotography, also known as astronomical imaging, is the photography or imaging of astronomical objects, celestial events, or areas of the night sky.

Wikipedia

Nightscape



Celestial objects



Star Trails



Milky Way



Deep Space

Image Credit: NASA

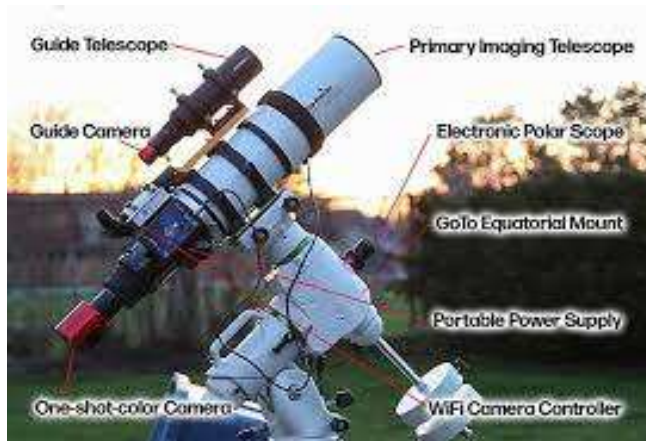
Image Credit: Google



We are not covering

- Tracking mounts
- Telescope mounts

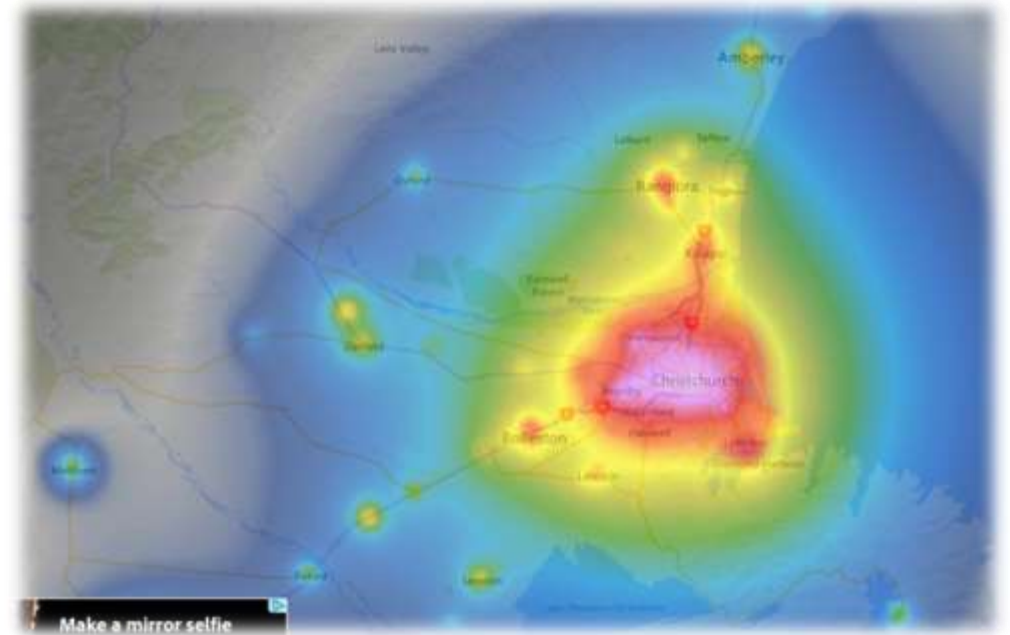
Image Credit: Google



Location Scouting

- **Light Pollution**

- Dark sky finder
- Common sense
- Moon phase



Location Scouting

- Light Pollution
- **Subject**
 - What direction do you want to look?
 - What time of day / time of year?



Northeast*
vs
South



Location Scouting

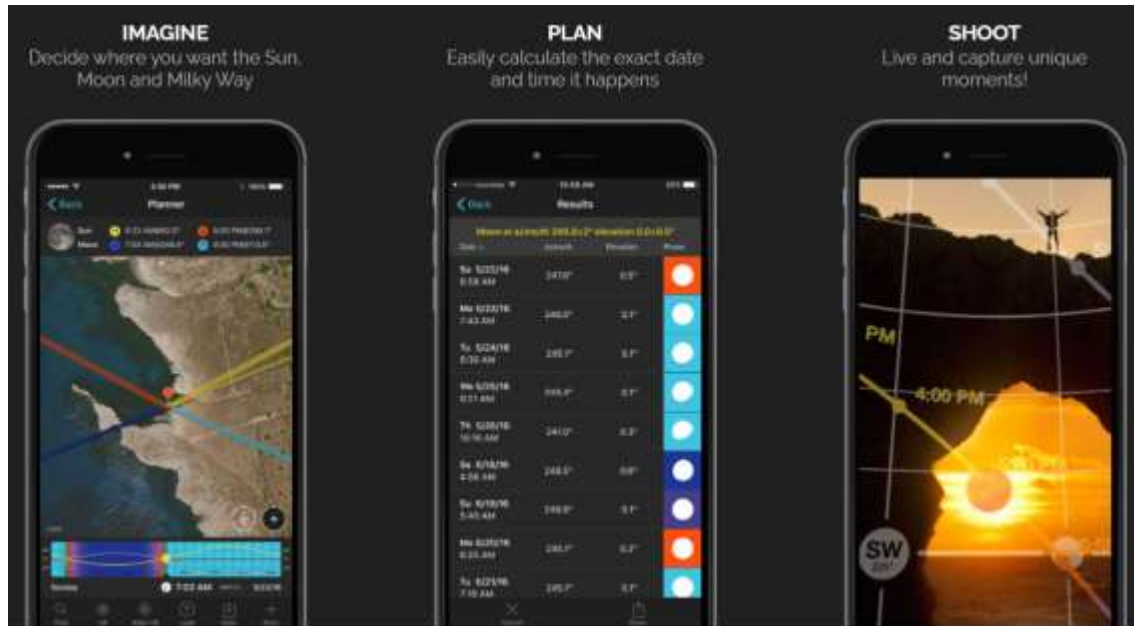
Planning the composition



(Image credit: Stuart Cornell)

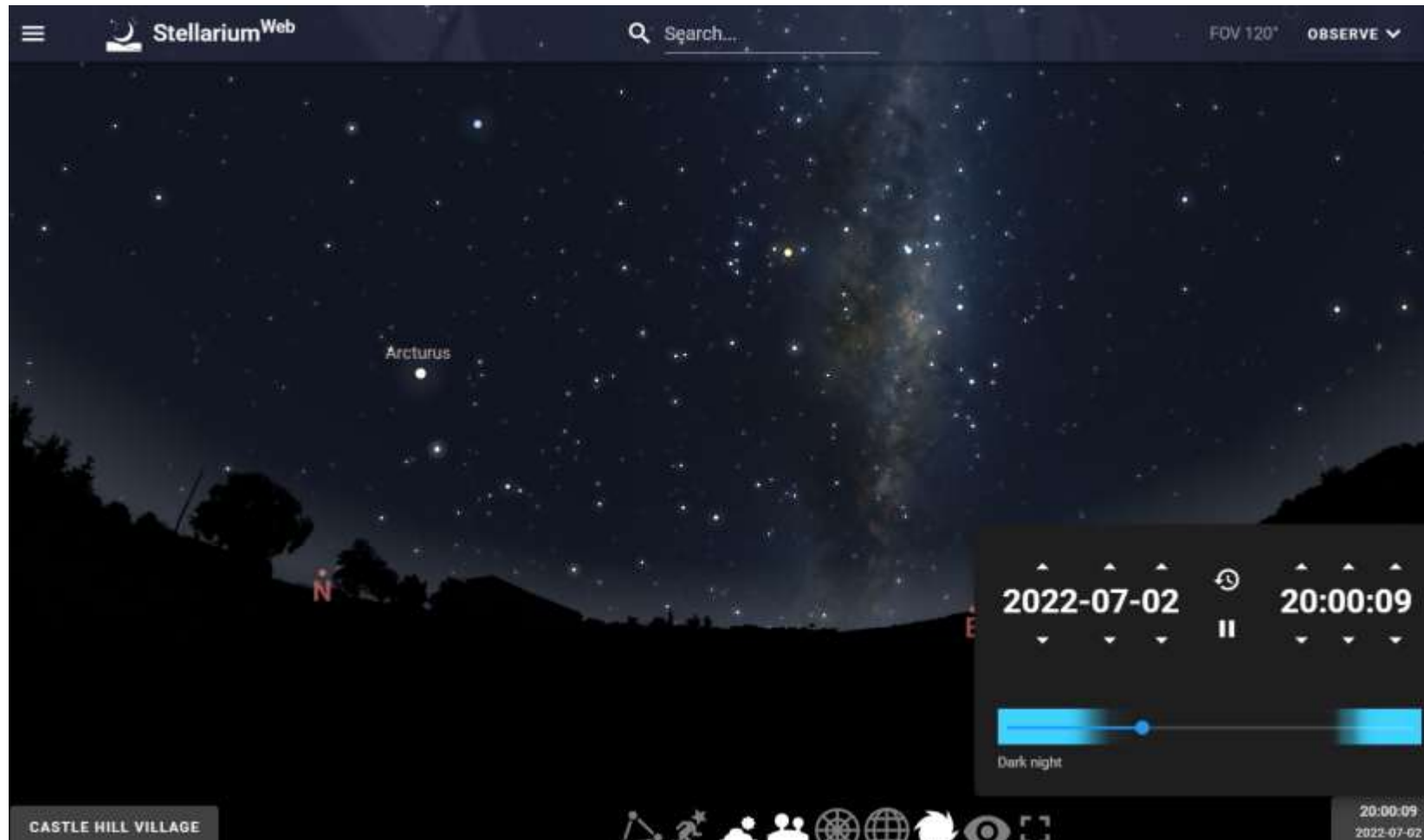
Location Scouting

PhotoPills app



Location Scouting

Stellarium (web or app)



Location Scouting

- Light Pollution
- Subject
- **Composition**
 - Unobstructed view
 - Foreground (or not)
 - Framing (or not)



Location Scouting

- Light Pollution
- Subject
- Composition
- **Safety & legality**



Location Scouting

- Light Pollution
- Subject
- Composition
- Safety & legality
- **Weather**



Set-up

- **Equipment**

- Fully manual camera + spare batteries
- Tripod
- Delayed timer or remote release
- Torch (red)
- Clothing – layers
- Study shoes

*Tracking & Telescope
mounts not covered today*

Image Credit: OPT Telescopes



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- **Focus**

- Pre-focus
- Use manual mode
- Live View
 - “Focus magnifier” / “Manual focus assist”



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- **Settings**

- RAW
- Aperture
 - Fast
 - Stop down for sharpness
- Shutter speed
 - 500 “rule”
- ISO
 - 1600 minimum
 - Noise reduction
- White balance
 - Shoot in Raw and stick to 1 setting

Set-up: Shutter Speed

**Ideal Shutter Speed =
500 / Crop-Factor x Focal Length**

$$35.7'' = 500 / (2 \times 7\text{mm})$$

The 500 Rule

Lens Focal Length	Full Frame Camera	1.5 Crop (Nikon)	1.6 Crop (Canon)
14 mm	36 sec	24 sec	22 sec
16 mm	31 sec	21 sec	20 sec
20 mm	25 sec	17 sec	16 sec
24 mm	21 sec	14 sec	13 sec



60" image – star trails only visible when enlarged



Micro 4/3:

- 8mm
- f/4.0
- 25"

Set-up: ISO



ISO 1600



ISO 3200



ISO 6400



ISO 12800

Set-up: ISO (edited images)



ISO 1600

ISO 3200

ISO 6400

ISO 12800

Set-up: White Balance

Cloudy



Tungsten



Combined



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Light Painting

Oops...









Southern Hemisphere

© pixelsandwanderlust.com



Star Trails

Star Trail Technique – *use longer shutter speeds!*

- Shoot Multiple Exposures (maintain settings and composition)
 - Enables control in post processing of the length of star trails
 - Reduces noise caused by sensor heat
 - Can capture separate image(s) that expose for the foreground
 - Requires intervalometer
 - Number of exposures / shooting time
 - Time between exposures
 - 1-2" to overlap the trails
 - 5-10" for breaks in the trail
- Shoot single exposure

Possible software options:
Photoshop, ImageTacker,
DeepSkyStacker, Starstax, and Star
trails



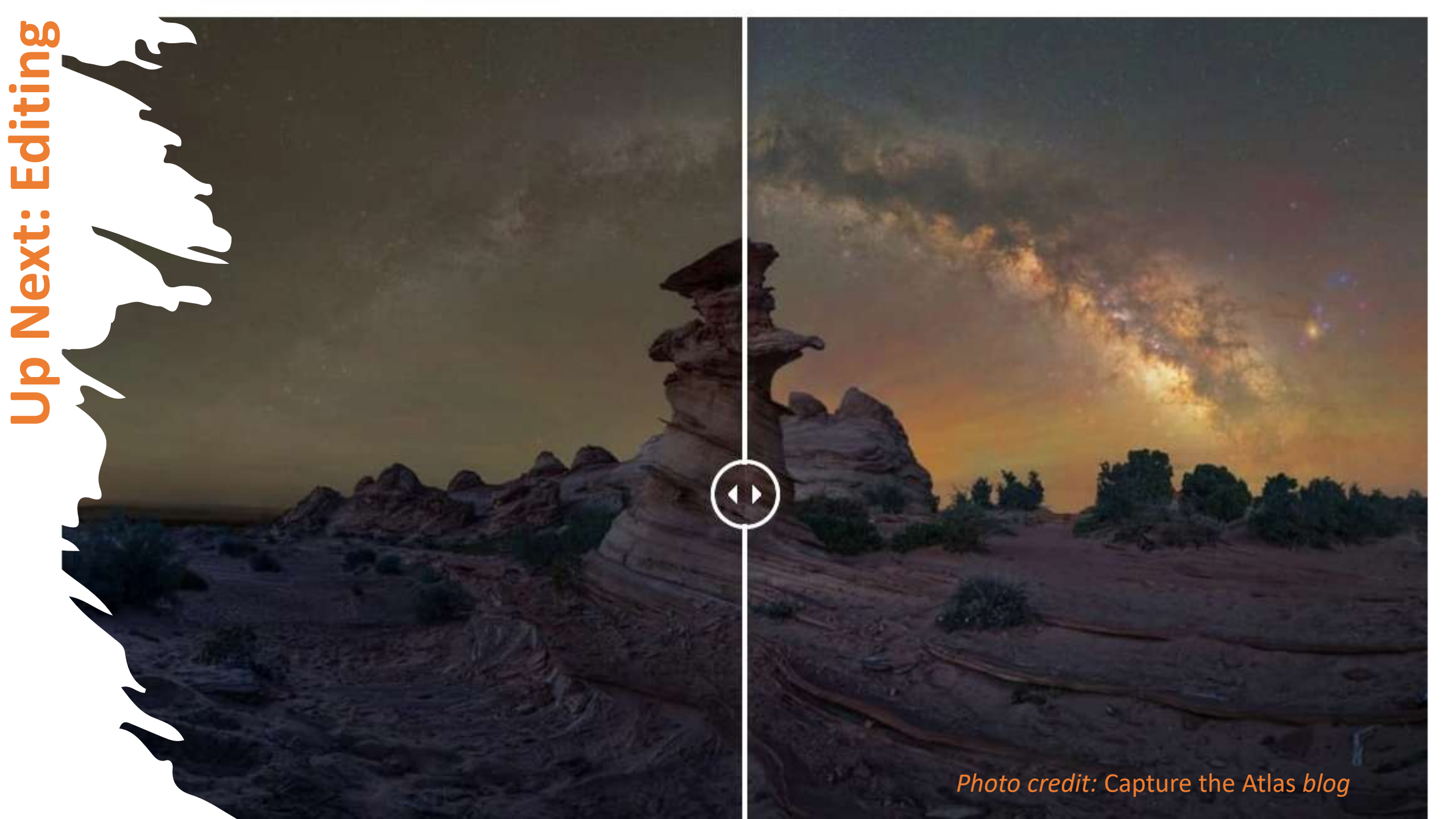
Panoramas

- Take more shots than you think you need
 - Lots of overlap
 - Plenty of space at the edges of the frame
- Portrait vs landscape framing

Histogram



Photo credit: Capture the Atlas blog



Up Next: Editing

Photo credit: Capture the Atlas blog

Mark Gee's Simple Processing

- Cool down the white balance (somewhere between 3200k and 4500k)
- Bump up the saturation and vibrance (to about 30 or 40)
- Spend a little time going back and forward adjusting the colour temp and saturation and vibrance.
- Bring the clarity up to about 40
- Lift the shadows for any foreground
- Check the highlights but probably won't need to adjust much
- Adjust you whites and blacks to avoid any clipping in the histogram (you won't be able to completely avoid clipping)
- Bring the noise reduction luminance up to about 30

With the aurora shots last night you can also pulled up the individual colour sliders for orange and yellow.