Night Landscape Photography

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Whether you choose stars as points (static stars) or star trails, the sky in night landscape photography is just one component, the backdrop for your scene. It cannot stand alone.

Spend some time learning about the technical aspects of night photography… not to get the perfect shot, but to get to the point where your camera does not get in the way of realizing your vision.

Only when you don’t have to think so much about the technical aspects can you truly focus on your vision.

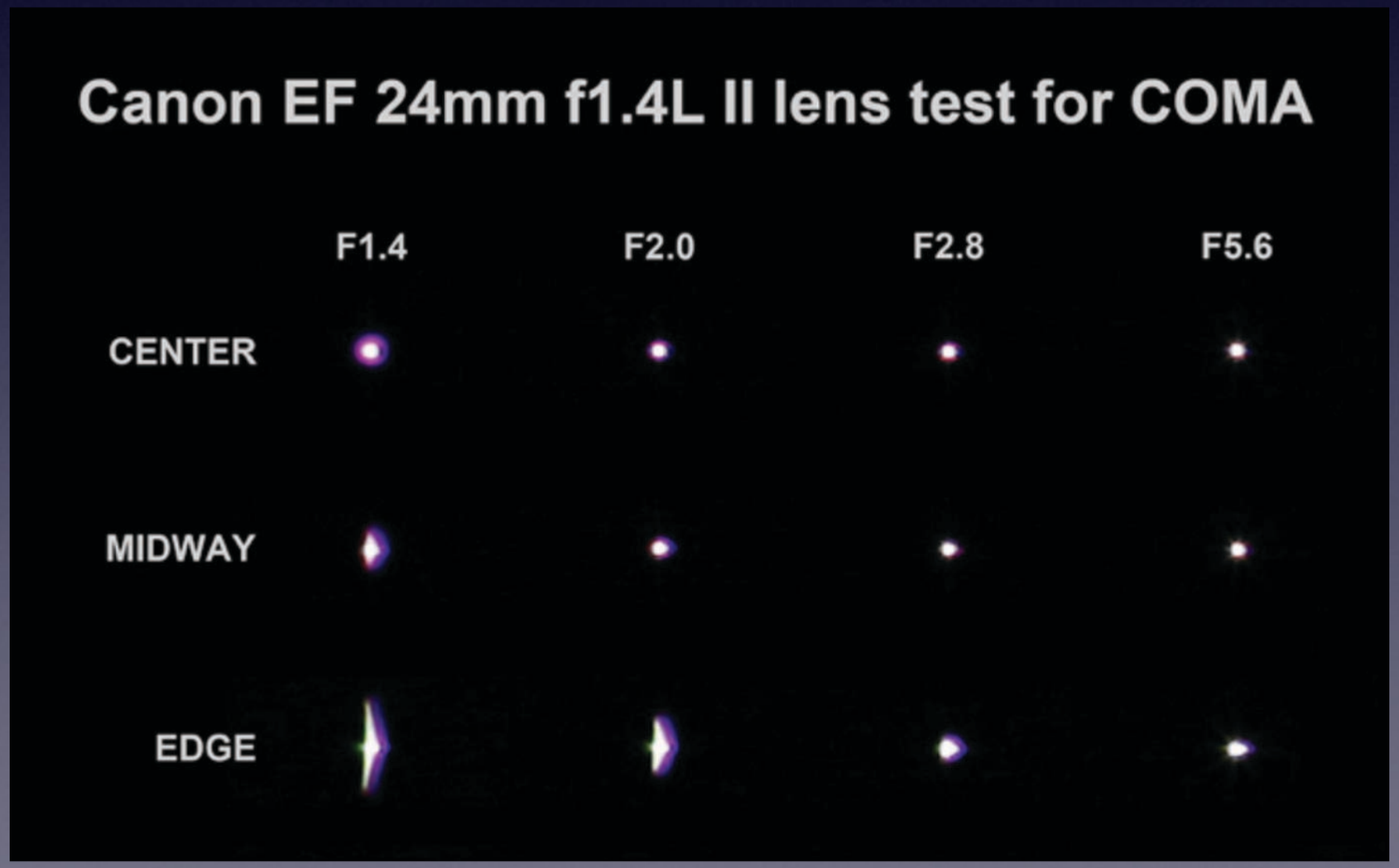
1. Equipment

- DSLR with “Bulb” mode capability
- Sturdy tripod
- Remote cable or wireless release (with intervalometer [timer] function)
- Your fastest (e.g., f/1.4, f/2.8) and widest (e.g., 24mm) lens

Why use a quality lens?

Coma

A lens aberration that causes points of lights (e.g., stars) near the edges of the frame to take on a wing-like appearance.

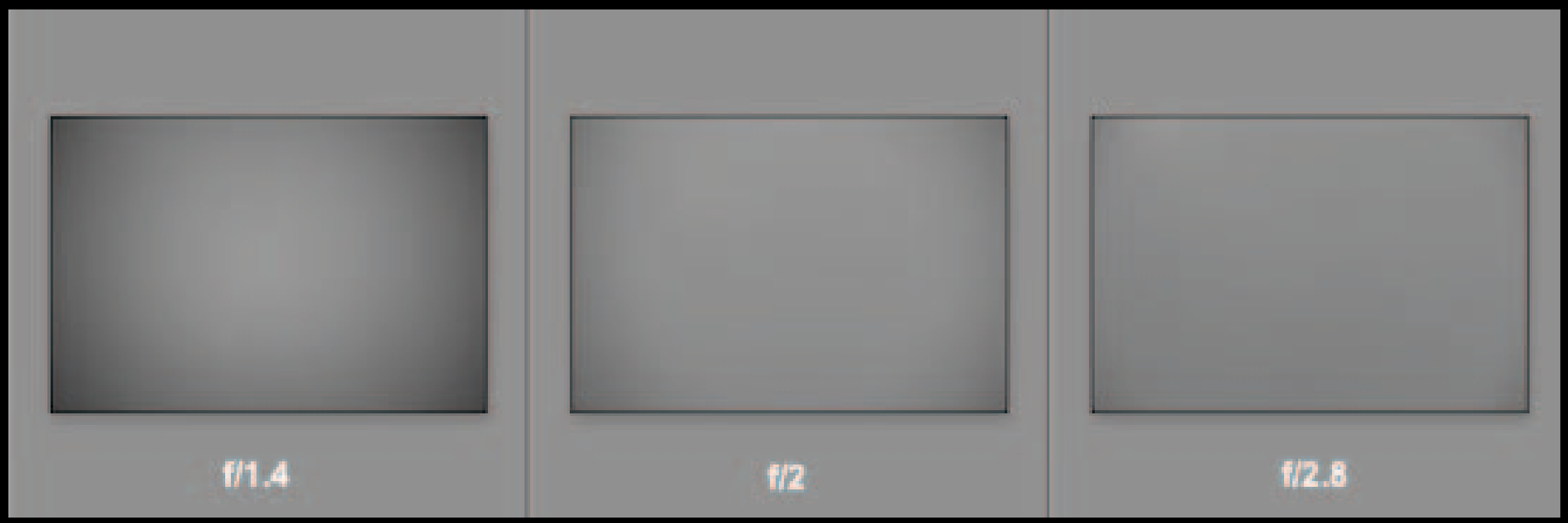


Chromatic Aberration

In night photography, it shows up as purple fringing around bright stars.

Vignetting

Darkening in the corners of the image. Worst at widest aperture and improves as you stop down.



- Low-powered flashlight, preferably with red and white lights
- Magnification loupe (optional)
- Smart phone (optional)

- Extra *charged* batteries
- For humid environments, dew protection — use chemical hand warmers on the lens, chamois cloth to wipe dew off lens

2. Camera Setup

Shoot in RAW

Shoot in manual mode

White Balance:

Fluorescent or ~3500K

Set focus and
tape down
(with gaffer tape)

Turn off:

Image Stabilization/ Vibration Reduction on your lens

Turn down
LCD brightness

Remove filters from lenses

3. Understanding the Night Sky

It starts with the *Blue Hour*

Sunset / Sunrise >

Civil Twilight (when sun is between -6 to 0 degrees below horizon)

Nautical Twilight (when sun is between -12 to -6 degrees below horizon)

Astronomical Twilight (when the sun is -18 to -12 degrees below horizon)

As soon as the sun sinks below the horizon,

you are taking night images.

Each stage of twilight lasts about 25 minutes at Miami latitude


day
horizon
sunset
civil twilight
6°
12°
18°
civil dusk
nautical twilight
nautical dusk
astronomical twilight
astronomical dusk
night

Blue Hour - Civil Twilight
25s, ISO 200, f/2.8, 17mm
Nikon D800e, Nikkor 14-24mm lens

Blue Hour - Nautical Twilight
182s, f/5.6, ISO 200
Nikon D800E, Nikkor 28-300mm lens

Blue Hour - Nautical to Astro Twilight
20s, f/4, ISO 800, 24mm
Nikon Df, Nikkor 14-24mm f/2.8

The Moon Dictates!

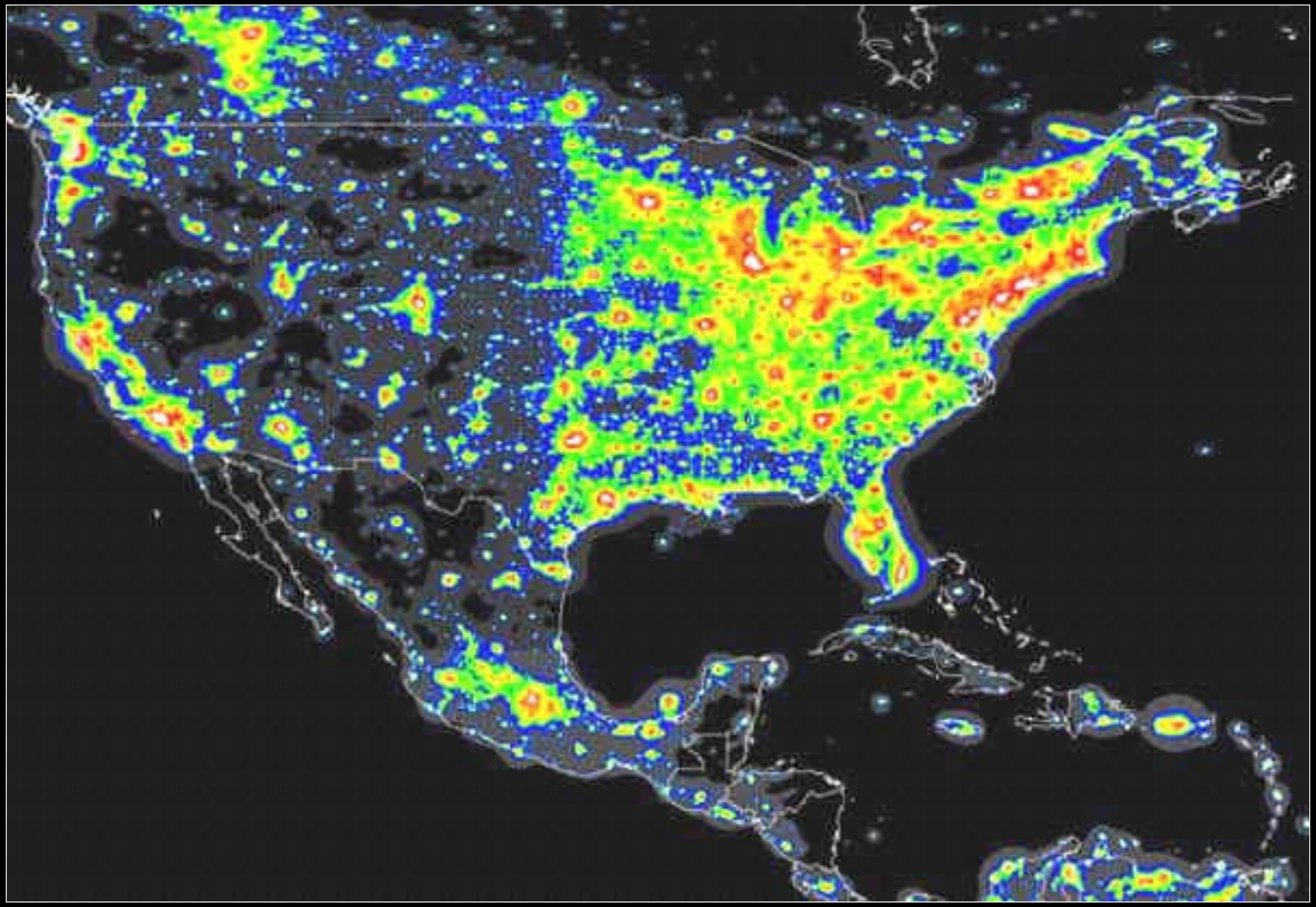
Be familiar with and aware of the lunar cycle.

A simple way of splitting it up:

- Week 1: New Moon to First Quarter
- Week 2: First Quarter to Full Moon
- Week 3: Full Moon to Last Quarter
- Week 4: Last Quarter to New Moon


New Moon
Waxing Crescent
First Quarter
Waxing Gibbous
Full Moon
Waning Gibbous
Last Quarter
Waning Crescent
New Moon

Light pollution plays a major role in night photography



To find dark sky areas:

www.darksky.org or

www.lightpollutionmap.info

4. Focusing at Night

Focus Method 1: Moon or Distant Bright Light

- Focus on the moon (if it is out) or a distant bright light using autofocus;
- Lock down the focus ring with gaffer tape

Focus Method 2: Far Subject

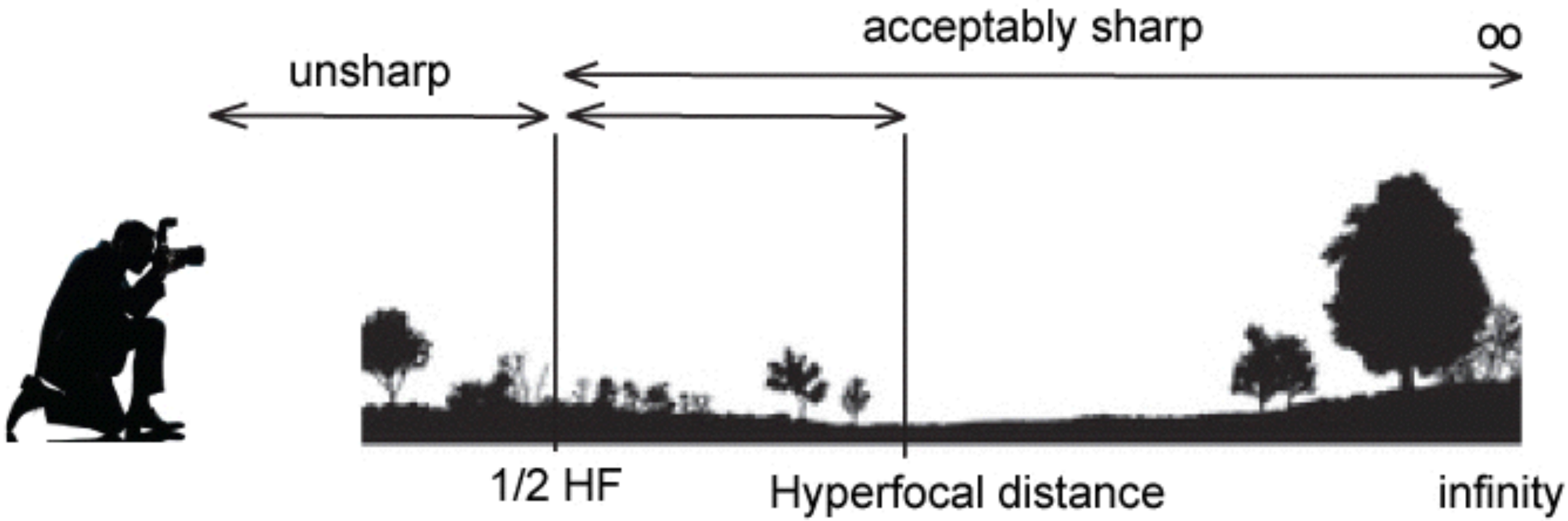
- Use center focusing point to focus on a far subject using autofocus *before dark*;
- Lock down the focus with gaffer tape;
- Wait for dark.

Focus Method 3: Live View

- Find a bright star or planet and place in center of viewfinder;
- Turn on Manual Focus;
- Turn on Live View and zoom to 10x;
- Manually focus until the star is sharp (when it is smallest);
- Tape down focus ring with gaffer tape.

Focus Method 4: Hyperfocal Distance

The hyperfocal distance is the closest distance at which a lens can be focused while keeping objects at infinity *acceptably* sharp.


acceptably sharp
∞
unsharp
1/2 HF
Hyperfocal distance
infinity

Whatever method you choose…

The stars need to be *sharp!*

5. Photographing Stars as “Points”

25s, f/2.8, ISO 3200, 22mm
Nikon D800E, Nikkor 14-24mm f/2.8

Alaska Pipeline, Fairbanks, Alaska
13s, f/2, ISO 1250, 25mm
Nikon Df, Zeiss 25mm f/2 lens

Badwater Basin, Death Valley NP
10s, f/1.4, ISO 1600, 35mm
Nikon D800E, Nikkor 35mm f/1.4 lens

The “500” Rule

$$\frac{500}{\text{Effective Focal Length}}$$

$$\approx$$

Max exposure time before stars begin to trail

For example,

500/25mm = 20 seconds

The longer the lens,

the shorter the time

6. Photographing Star Trails

Kitt Peak, Arizona (facing Tucson)
40 min, f/4, ISO 200, 24mm
Nikon Df, Rokinon 24mm f/1.4 lens

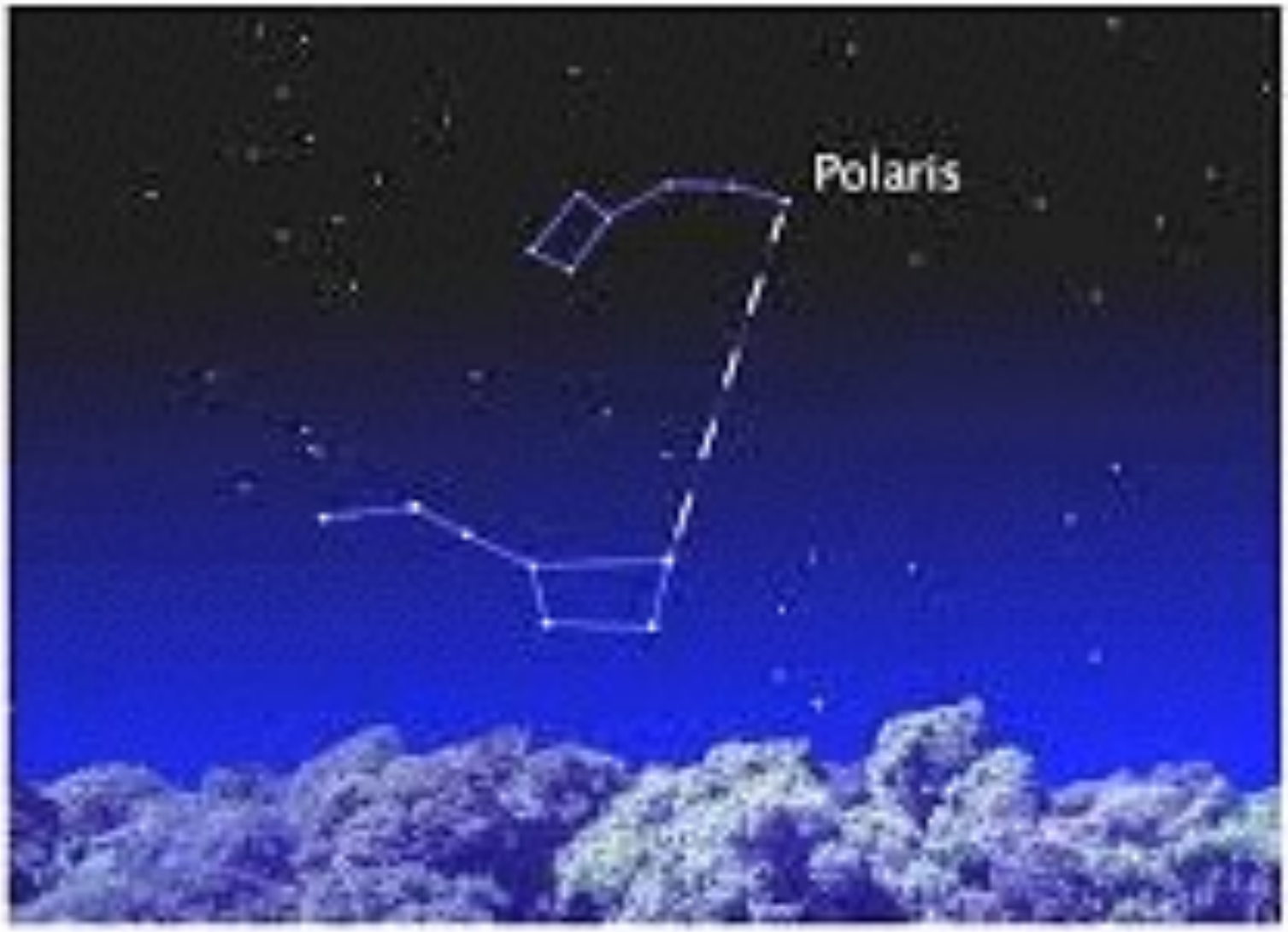
Movement

- Since Earth moves, the stars appear to move to the west (it's not the stars that are moving, it's us!).
- The stars appear to rotate around the poles.
- The movement is about 15 degrees per hour in right ascension ("horizontally"). They do not move in declination ("vertically").
- The longer the lens, the faster the stars appear to move.

Polaris

The “North Star” — aka Polaris — can be found at the number of degrees of your current latitude.

In Phoenix area, the latitude is 33.45 degrees north. So, if you face north and look up about 33 degrees, you can find Polaris.



Finding Polaris

Star Trails Around Polaris
10 x 300s, f/2.8, ISO 200, 52mm
Nikon D7000 (astro converted), Sigma 35mm f/1.4 lens

Two Methods for Shooting Star Trails

METHOD 1:

- One long exposure: Use a fast lens (e.g., f/2.8 or f/4);
- Do one long exposure only when there is no moon (new moon, before moon rises, or after moon sets), and the temperature is 50 degrees Fahrenheit or below;
- If there is even a crescent moon, don’t expose for more than 10 minutes;
- Start with a test shot (explained below).

24min, f/4, ISO 200, 24mm
Nikon D800E, Nikkor 14-24mm lens

METHOD 2:

- Multiple shorter exposures that you will stack in post processing;
- Shoot multiple exposures with a fast, wide lens (e.g., 24mm, f/2.8);
- Aim for a total of at least 60 minutes of exposure (e.g., thirty 3-minute exposures or forty-five 2-minute exposures);
- An intervalometer is needed for this.

Kitt Peak
20 x 4min, f/2.8, ISO 400, 24mm
Nikon D800E, Nikkor 14-24mm f/2.8

15 2-min exposures, f/2.8, ISO 800, 24mm
Nikon D800e, Nikkor 14-24mm f/2.8 lens

Multiple star trail exposures: Starting settings:

f/4
ISO 400
30s - 4min (depending on how dark it is)

Capturing Images for Stacking

- Turn off Long Exposure Noise Reduction;
- Expose to the right of the histogram;
- Base exposure length on experience with your camera's noise levels, ambient temperature, and high ISO test shot (discussed below).

- Base *total exposure time* on desired *length* of star trails;
- If desired, add light painting on first and/or last exposures;
- Take an extra identical exposure at the end as a dark frame.

Processing Star Trails:

- StarStaX (freeware for Mac or Windows)
- Photoshop

8. Full Moon and Milky Way

Trapper’s Moon Rising
1/40s, f/9.5, ISO 640, 1020mm
Nikon D7100, Nikkor 80-400mm, f/4.5-5.6 w/ 1.7x TC

Full Moon Rising

The day of the full Moon is the only day each month when it is possible to see a full Moon rising or setting in the landscape with enough light from the rising or setting sun to balance a good exposure.

Composition:

- Pre-plan where you will shoot the Moon.
- Make sure foreground is far enough from you to help emphasize the Moon; otherwise, the Moon will appear insignificant.
- Use at least 200mm. The longer the lens, the better.
- *BRACKET, BRACKET, BRACKET!!!*

Ideal time to capture the full Moon is when it is near the horizon. You have about 10-15 minutes after the Moon starts to rise before the dynamic range becomes too great for the camera to handle.

Hunter’s Moon, Acadia National Park, Maine
1/200s, f/5.6, ISO 400, 200mm
Nikon D800E, Nikkor 70-200mm f/4 lens

The Milky Way:

In the Northern Hemisphere, it moves clockwise in the southern half of the sky, from south to southwest.

When Can I See the Milky Way?

- April and May — Facing south during the pre-dawn hours are best;
- June to Early August — Highest in the sky; best time near midnight (though it will be visible almost all night);
- Mid-August through September — Best time is soon after astronomical twilight.

Watson Lake
20s, f/2, ISO 3200, 25mm
Nikon D800E, Zeiss 25mm f/2 lens

13s, f/2, ISO 3200, 35mm
Nikon Df
Sigma 35mm f/1.4 lens

A Few Last Things…

A Cardinal Rule

Always use the histogram!

Don’t trust the LCD to give you a true representation of your image.

Expose to the right (without blowing out the highlights!)

GOOD APPS FOR NIGHT PHOTOGRAPHY

- Moon Calendar (IOS only; free)
- The Photographer’s Ephemeris (IOS and Android $8.99, free Web app)
- PhotoPills (not free)
- Stellarium, SkySafari, Sky Map, Planets
- DOF Master
- Trigger Trap

NIGHT PHOTOGRAPHY ETIQUETTE

- Be careful not to shine your flashlight in someone else's shot or eyes;
- Don't walk in front of someone else's camera without asking first;
- Speak in quiet voices — enjoy the serenity!
- Be careful not to bump into someone else's tripod — you don't want to ruin someone's long exposure!