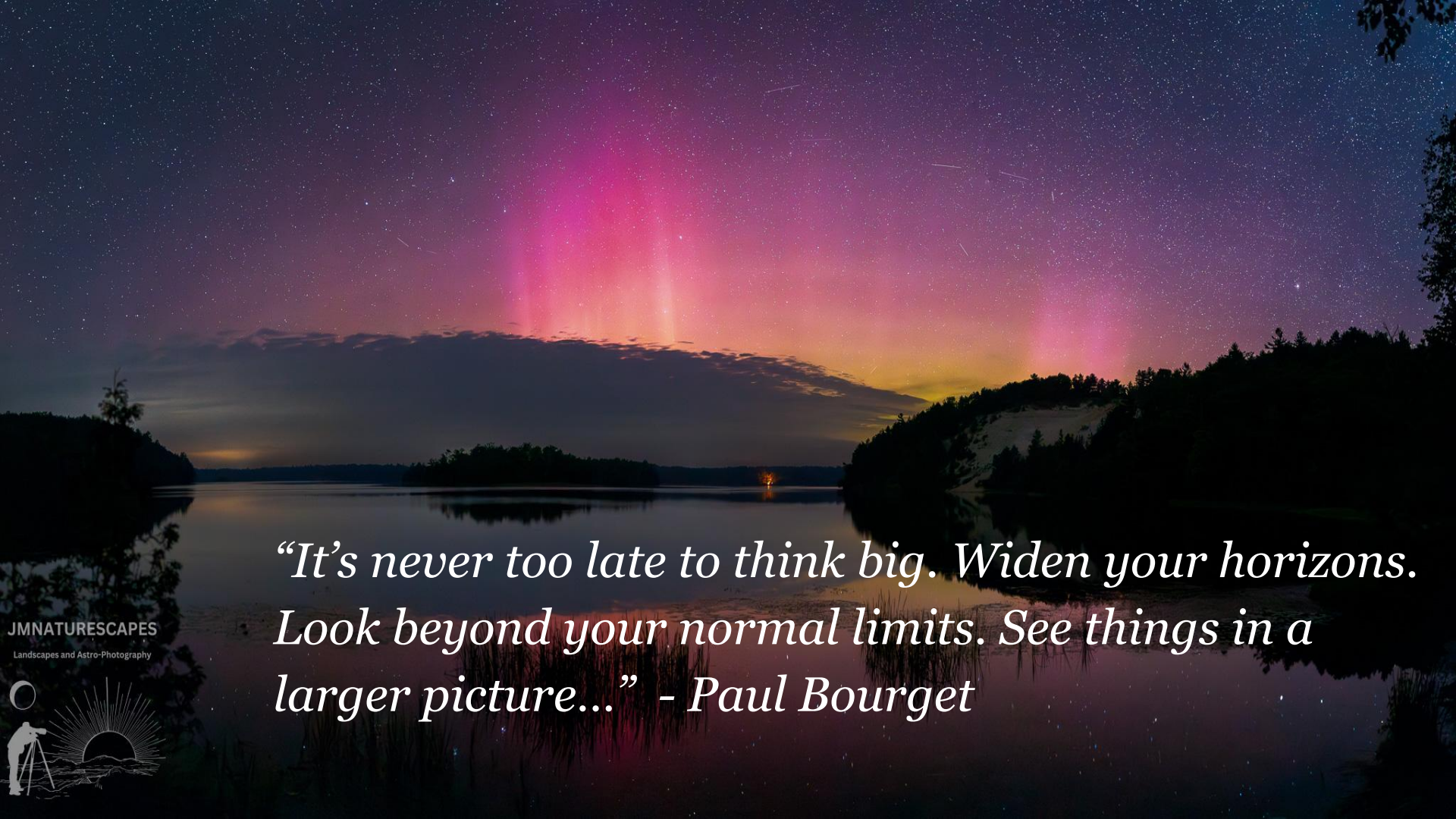

THINK BIGGER
Mosaics, Panoramas, and Timelapses.
JMNATURESCAPES
Landscapes and Astro-Photography



“It’s never too late to think big. Widen your horizons. Look beyond your normal limits. See things in a larger picture…” - Paul Bourget

Expanding beyond your comfort zone.

It’s easy to get set in your ways.

Being a simple point and shoot photographer can be rewarding and you can capture stunning results.

Afterall, single shot photos typically require the least amount of effort both in the field when taking the photo and post production when editing the photo.

To grow as a photographer it’s important to push your boundaries and comfort zones by learning and implementing new techniques into your photography.

“Be willing to get out of your comfort zone, if you want to grow.” - Chelsea Vincent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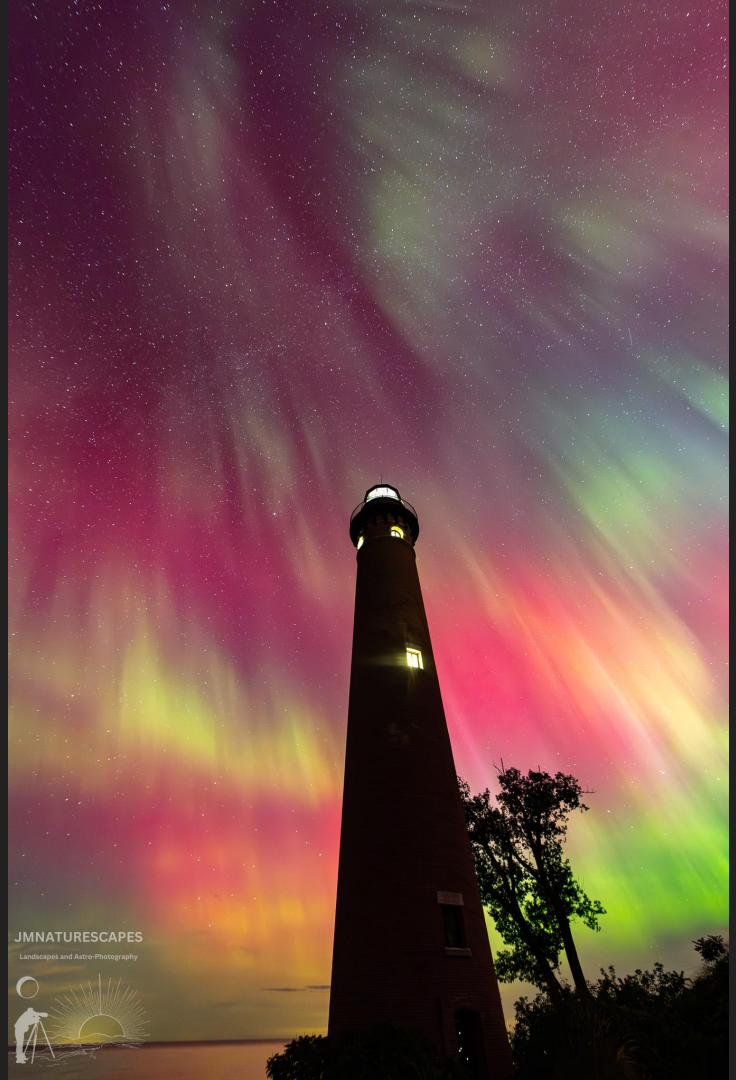
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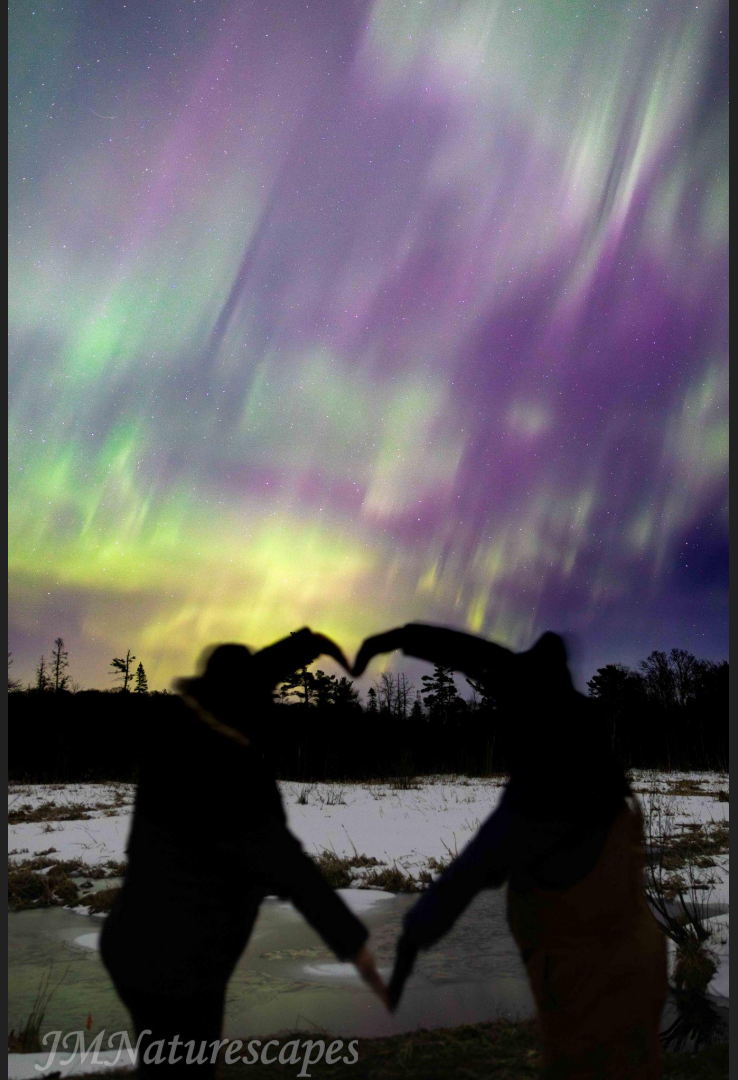
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About these shots.

These last 4 photos are all single shot frames.

The scope of the landscape can all fit within a single focal length. I think all were shot on 14mm.

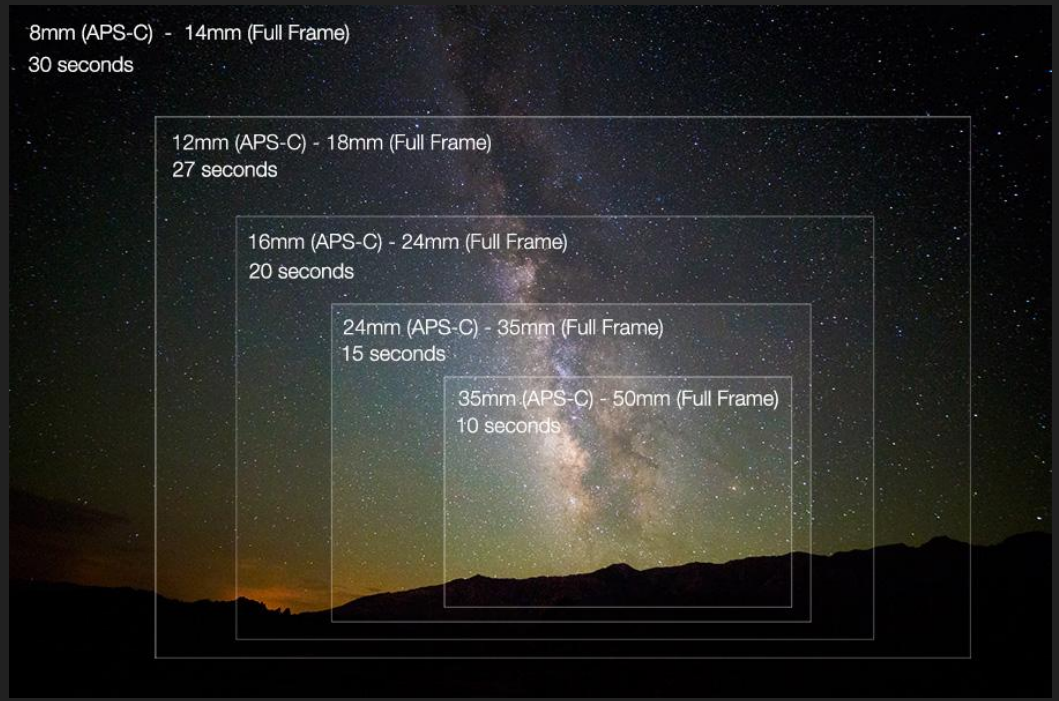
While the 1st and 2nd shot involve the technique focus stacking, all the photos are taken within a single field of view.

Understanding Field of view “FOV”

Field of view is the amount of the scene you see through the lens of your camera.

Wide focal lengths = more scene

Long focal lengths = less scene

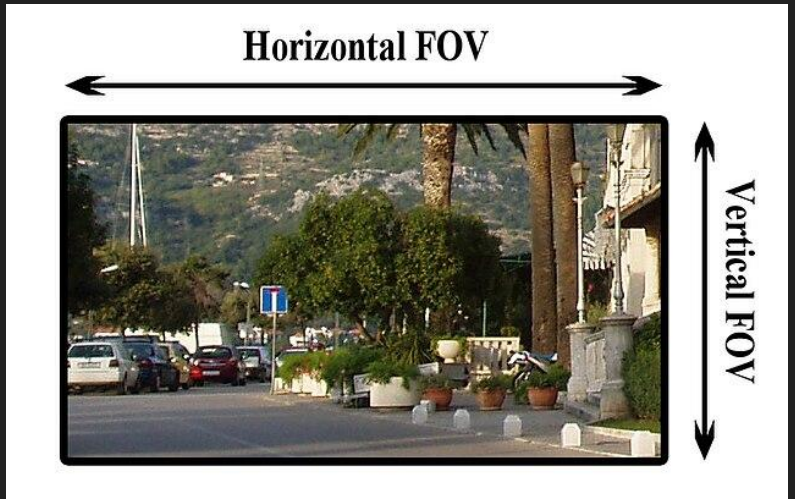


Horizontal FOV vs Vertical FOV. HFOV vs VFOV

Horizontal field of view will always be the X axis

Vertical field of view will alway be the Y axis

The angle of view will depend of the orientation of your camera.



Example. On 4:3 sensor size

14mm. In landscape orientation.

Horizontal AOV = 104.25 degrees. Vertical AOV = 81.2 degrees

14mm. In portrait orientation.

Horizontal AOV = 81.2 degrees. Vertical AOV = 104.25 degrees

Numbers are the same but HAOV and VAOV are flipped


Vertical AOV
VAOV 104.25
HVOV 81.2
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Horizontal AOV


HAOV 104.25
VAOV 81.2
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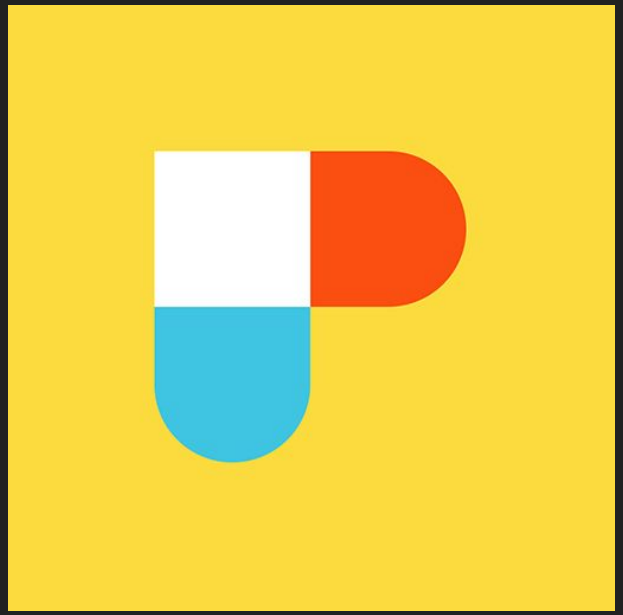
Horizontal AOV
Vertical AOV

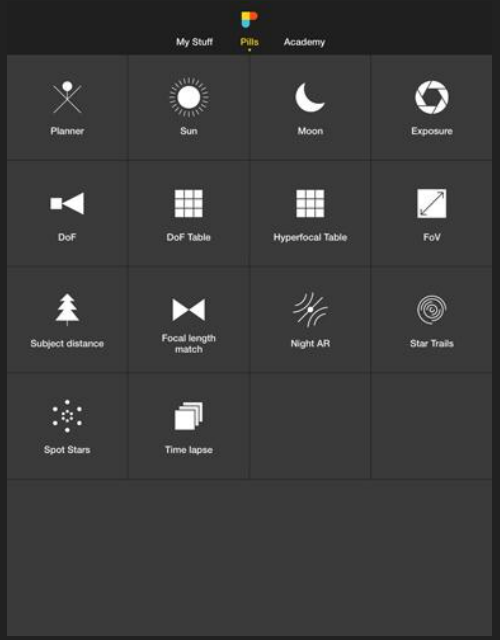
Angle of view chart for common focal lengths in landscape orientation

Focal Length	Horizontal AOV	Vertical AOV
14mm	104.25 degrees	81.2 degrees
15mm	100.39 degrees	77.32 degrees
20mm	83.97 degrees	61.93 degrees
24mm	73.7 degrees	53.13 degrees
28mm	65.47 degrees	46.4 degrees
35mm	54.4 degrees	37.85 degrees
40mm	48.46 degrees	33,4 degrees
50mm	39.6 degrees	27 degrees
85mm	24 degrees	16 degrees

If you don’t have it already… you should

Download photopills It’ll save you worlds of complicated math, and will be your best photography friend and tool.





Mosaics vs Panoramas.

Panorama definition - a horizontally extended visual representation providing a wide view of a landscape or other scene, in photography made by joining a series of shots or by using a wide-angle lens

In photography, to me, panos are about the field of view. Wider looking than your typical shot

These can still have multiple rows and columns of shots

Mosaic definition - a surface decoration made by inlaying small pieces of variously colored material to form pictures or patterns.

Technically all panos are mosaic, but to me, mosaics have the same aspect ratio as a single shot but are made up of multiple images.

Panoramas

Milky way Mosaic

Pros of Mosaics and Panoramas

Larger size = bigger prints if you want to print.

Longer focal lengths = more details.

Mosaics often lead to a higher resolution better looking image.

Capture a wider field of view capable that a single shot.

Ultra wide field of view without the distortion of a fisheye eye lens.

The feeling of accomplishment putting all the images together into one epic piece.

Cons of Mosaics and Panoramas.

Larger pictures = bigger files sizes = need for bigger storage solutions.

Taking many photos to put into one requires more time taking pictures in the field and editing them at home later.

Messing up one image can lead to the entire image being ruined.

Using longer focal lengths can add another layer of limitations and difficulty (especially when using a star tracker)

The feeling of annoyance having to put the entire thing together.

Taking the panoramas.

I recommend taking your shots in Portrait orientation.

Make sure the base of your tripod where the ball head is attached is perfectly level (use bubble level)

Around 50% overlap between each image. (doesn't have to be perfect)

More is fine you'll just end up with more photos than you need

Divide the VAOV for your lens by 2 and rotate your ball head around by that many degrees.

Watch the center stars on the back of your LCD screen and move them 50% across the screen

Overshoot your panoramas. Try to always include extra photos on the ends incase you need to crop in.

The wider your focal length is the more lens distortion there will be. This can cause problems when merging the photos together and may require specialized panorama software to merge photos easily. The sweet spot is around 20mm.

How to figure out how many shots you need

The Full Milky Way arch spans 180 degrees across the sky.

You'll want a little bit of extra room on the sides so let's say your field of view is a total of 200 degrees.

If you have a horizontal field of 80 degrees and you want 50% overlap, you'll be rotating 40 degrees each shot.

200/40 is 5 so you'll want at least 5 shots.

50% overlap example

When to take Panos

Panos can be taken wherever whenever. Afterall, panoramas are just a technique used in photography.

If you are trying to specifically take full Milky Way arch panoramas with the core the best time to do so is March - June.

> Milky Way core rises late february right before sunrise and sets below the horizon in october. Once the milky way gets extremely vertical it makes panoramas look pretty ugly.

Winter Milky Way arch is best December-April

> Winter milky way starts high in the sky and it lowers throughout april

Mosaics can be taken wherever whenever.

March Winter Milky Way

March Core Milky way

April Core Milky way

April Winter Milky Way

May Core Milky Way

June Core Milky Way

Visualizing the core as it rises

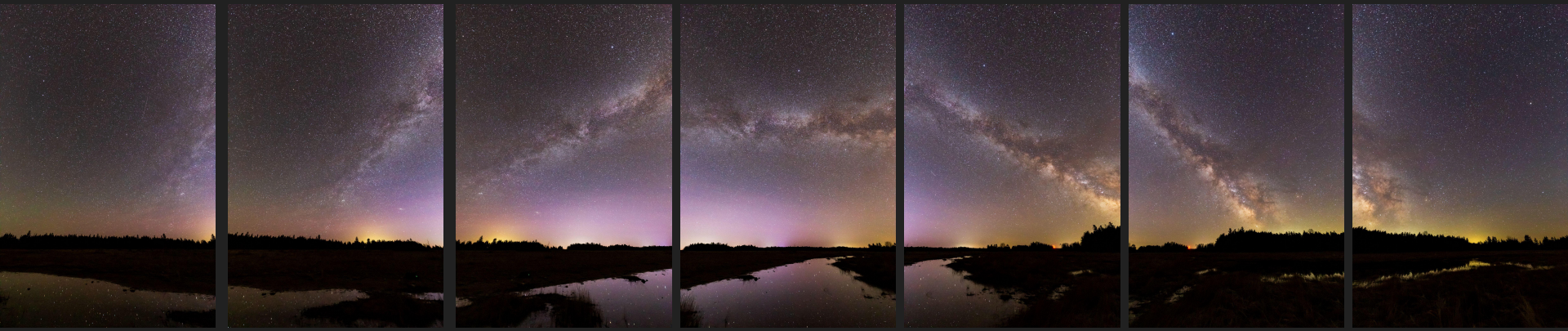
Sky rotation from right to left

Sky row taken 04-06-2024 right before asto twilight.

The pinkish glow is astro twilight starting

Start at one side and rotate with 50% overlap between each shot.

It’s that simple in the field!



Foreground shots rotation from left to right

It really doesn’t matter if you go right to left or left to right.

Put together

Do you need a separate foreground and sky pano?

Absolutely not, but I do recommend it for best results (this does require photoshop layering knowledge)

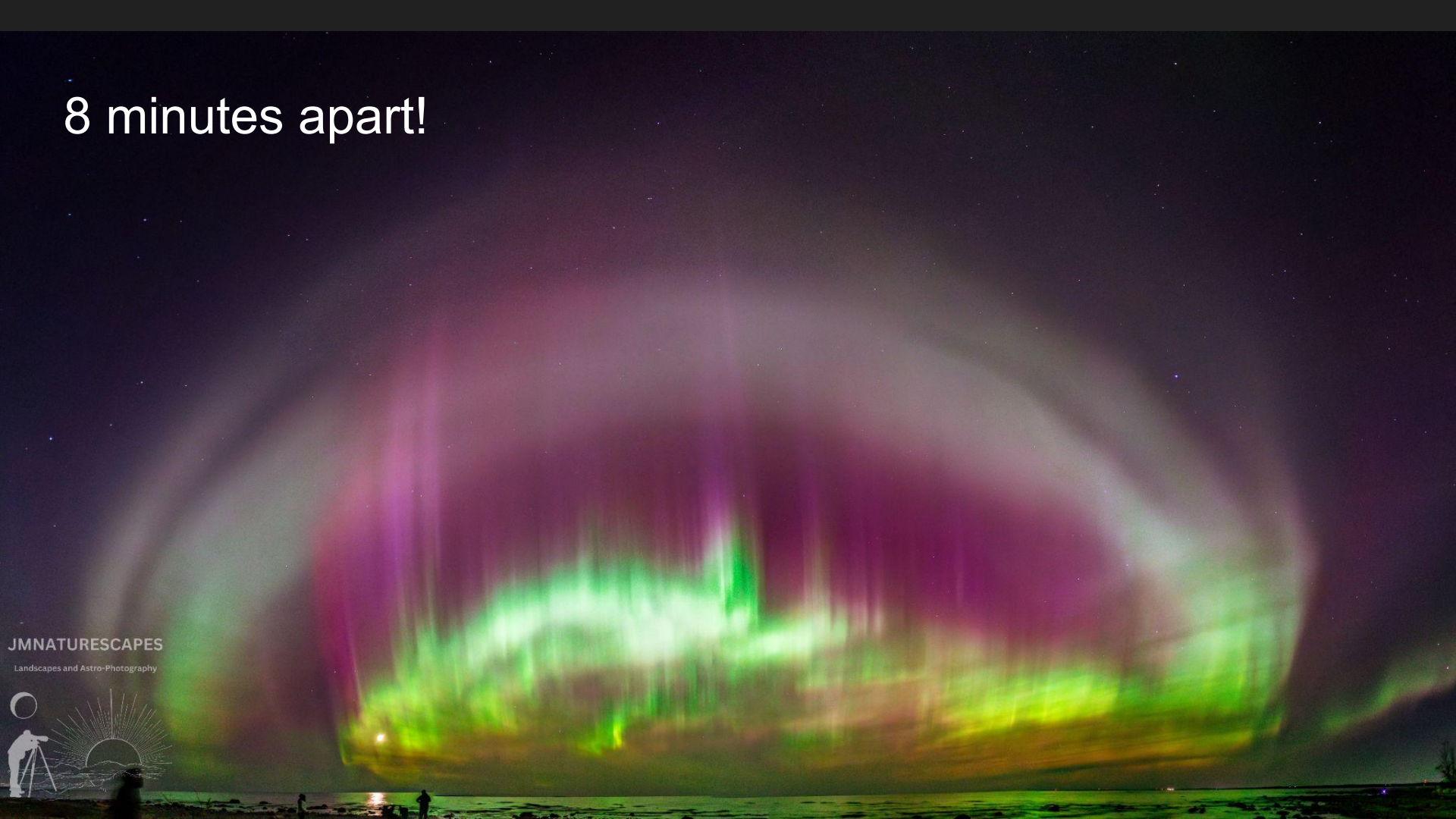
You tailor your settings for what you’re doing. Specific settings for your sky and different settings for the foreground. Merge separately and combined later in PS.

Depending on how wide your lens is 24mm can get the Milky way and your foreground in one shot when the milky way is very low. This is only possible March - May.

June and July you’ll need multiple rows of sky shots even with a wide angle lens. You’ll bare minimum need 1 row for the sky and 1 separate foreground row

Aurora panorama examples.

8 minutes apart!

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28 mm panorama

50mm panorama

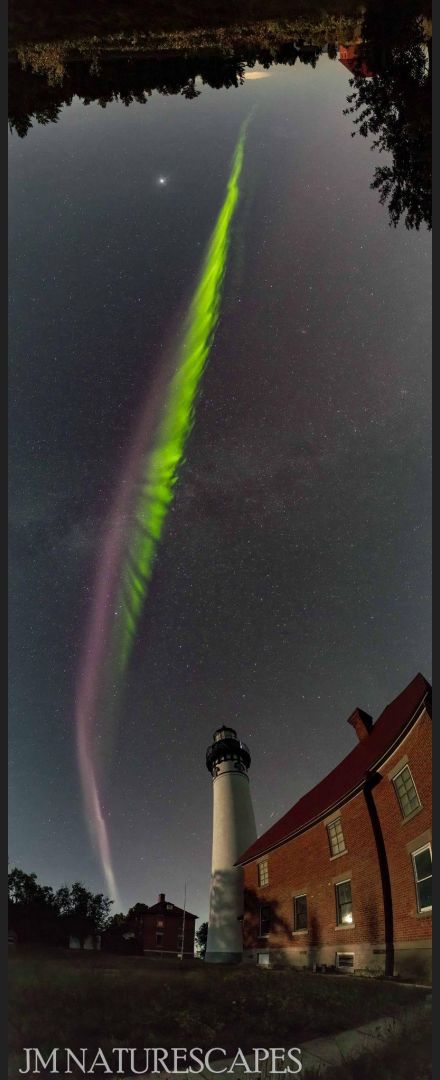
Special mentions: Vertoramas

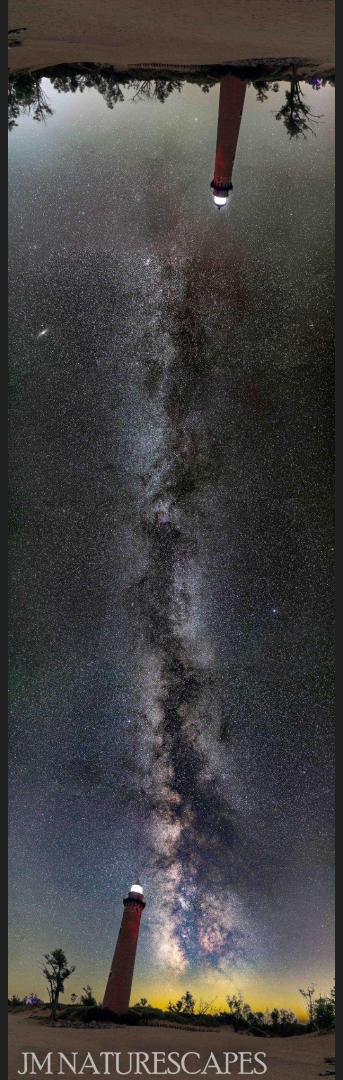
Vertoramas are vertical panoramas.

Typically taken in landscape orientation, you'll start on the bottom and pan the camera up overlapping each image.

Exact same as panoramas just going up instead of to the side.

These are awesome for STEVE!





Mosaics.

Mosaics are basically just multi row panoramas

They involve having multiple rows and multiple columns of single images.

They have all the same pros and cons of panoramas.

Mosaics typically involve using non-wide angle lenses such as 35mm all the way up to but not limited to 135mm

For mosaics you may want the same field of view as a 14mm single shot, but you want more detail, higher resolution, and a larger file size so you can print big.

That’s when to do a longer focal length mosaic.

Comparing settings at different focal lengths.

14mm

Iso 6400, 20 sec, F2.8

50mm

Iso 6400 5 sec, F1.4

The amount of like you gather is the exact same in both lenses. The 50mm has 2 stops of brightness via aperture but losses 2 stops of light because of trailing over 5 seconds.

Aurora Mosaic Example

Sky

2 rows x 5 images

SS 2.5sec, iso 6400, F2.8

Foreground

1 row 5 images

SS 30sec, ISO 800, F4

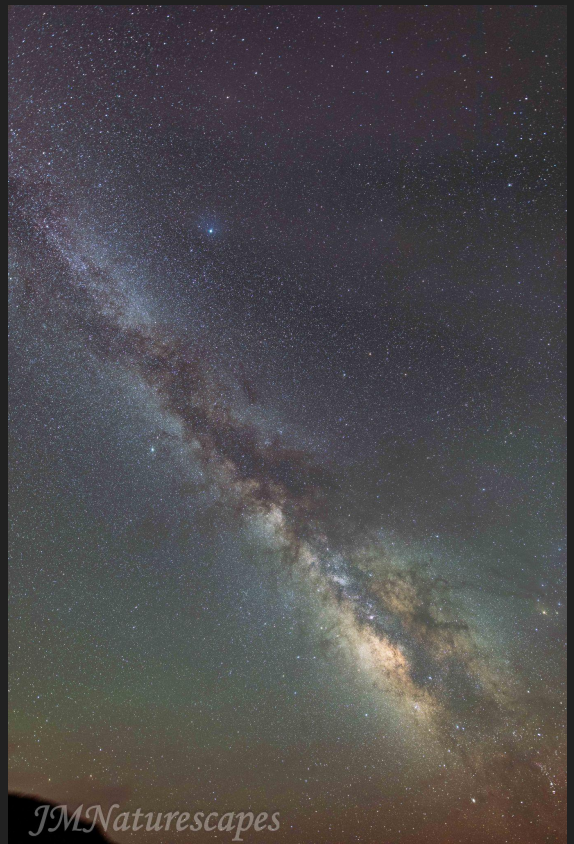
14mm screenshot from photo pills

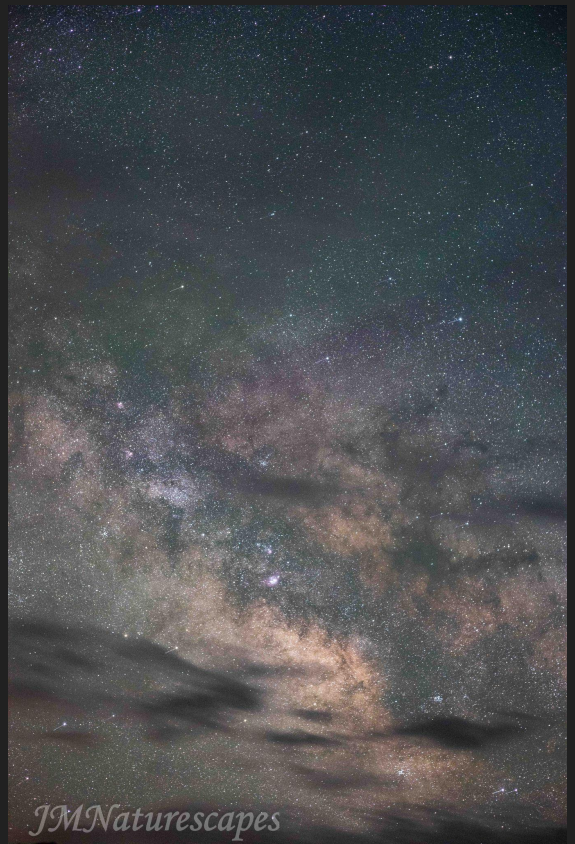
You can see in this screenshot this is the photo I was wanting to create.

I knew I wanted to be able to print this big so I wanted to do a 50mm mosaic.

What a single 14mm looks like vs a single 50mm looks like

Huge difference in field of view!

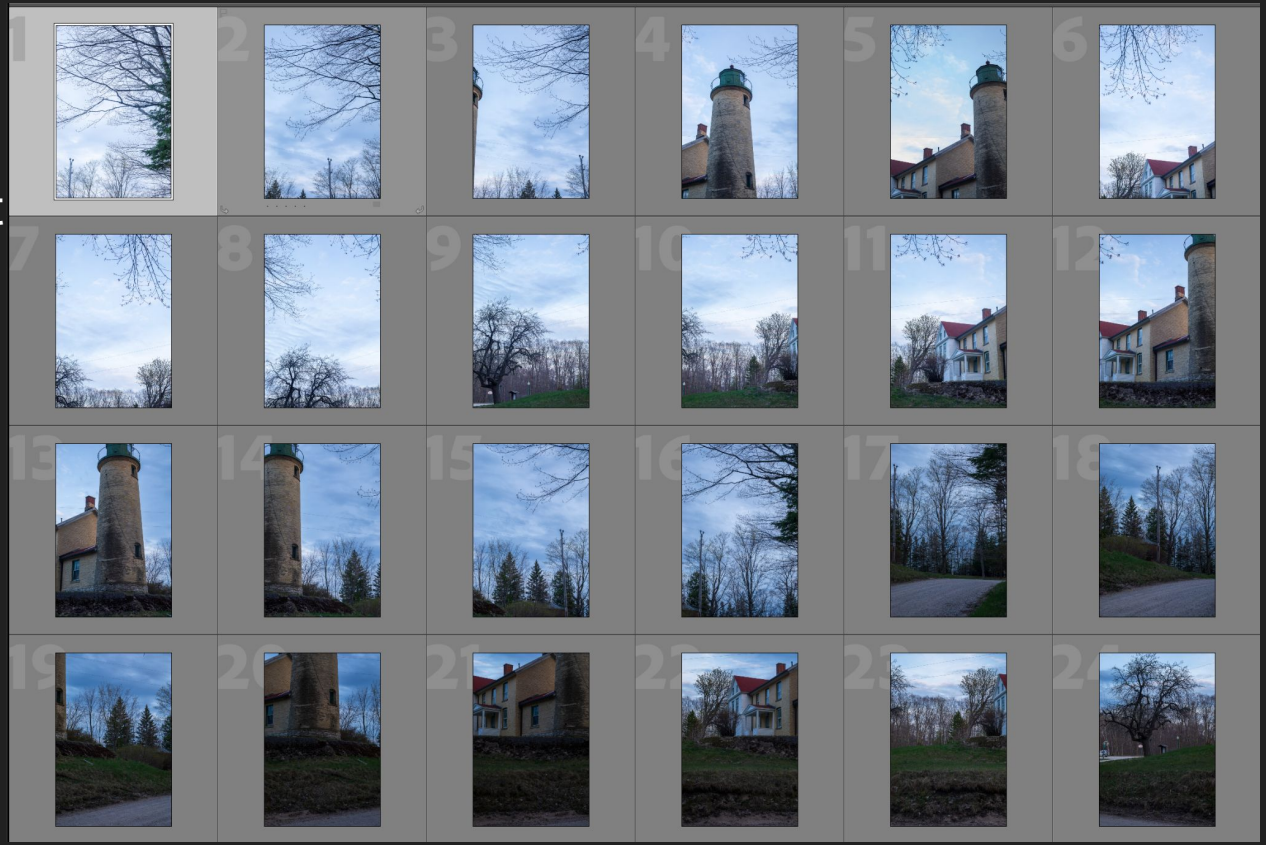




Foreground shots

I took all shots when the clouds covered the sun during sunset since I didn’t know when I was going to be down there again.

3 rows of 8 photos



Merged foreground mosaic

Image size

20259px x 12750px

1.44G

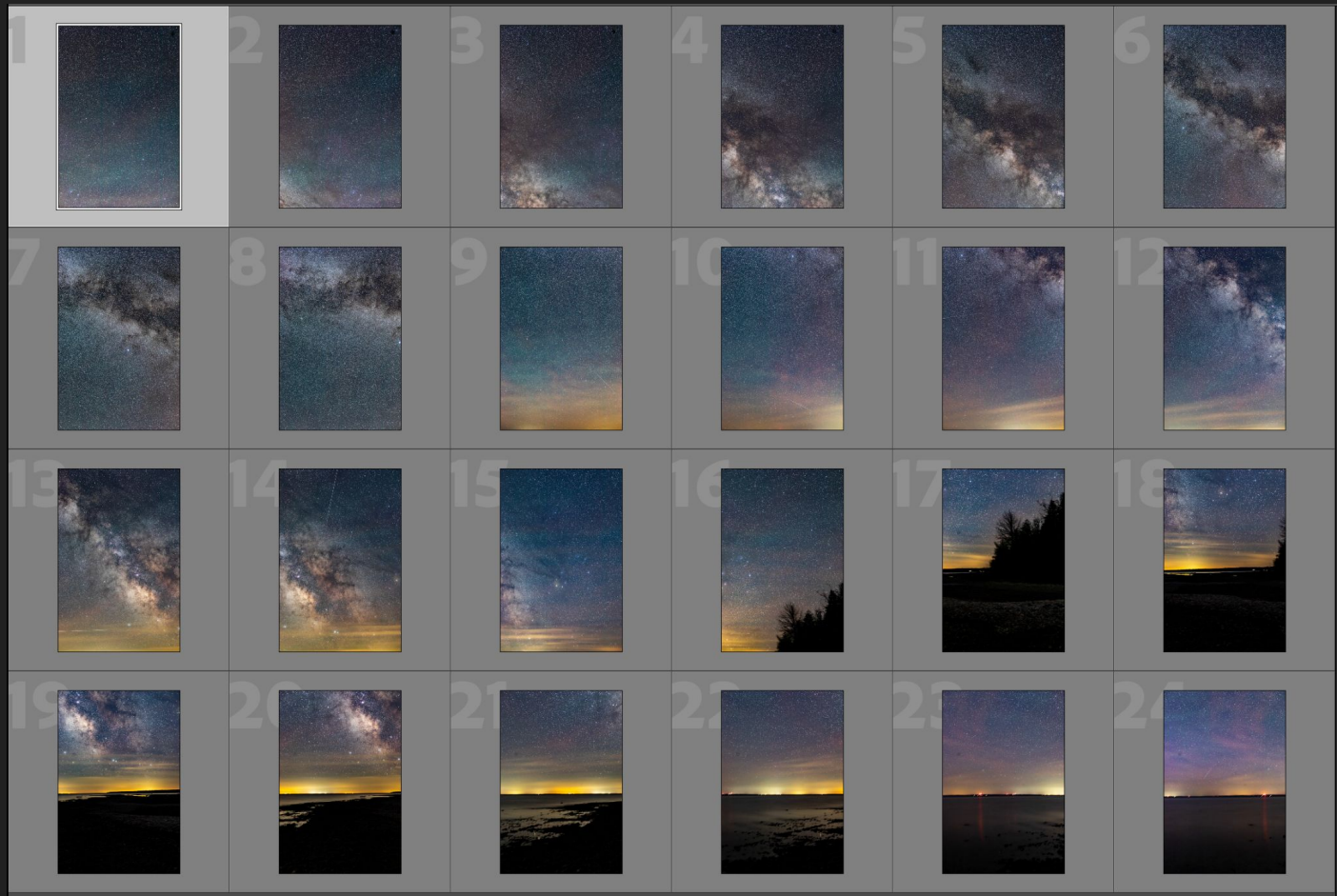
84.41in x 53.12in

240ppi

Sky images

24 images total

3 rows by 8 images



Merged sky shot

Image size

20495px x 12875px

1.96G

85.4in x 53.65in

240ppi

Merge the foreground shot and sky shot together for an accurate blend

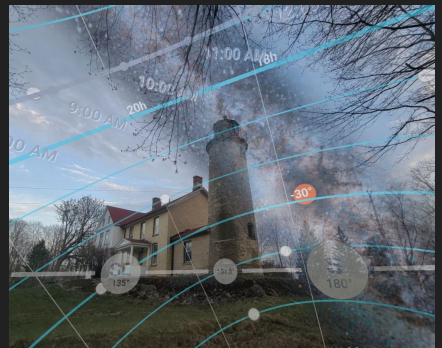
Image size

PSB file 5.73GB

17791px x 11874 (cropped)

59.3in x 39.48in

300ppi



Programs to put together Panos and Mosaic

Lightroom

Photoshop

Hugins

Microsoft ICE

PTGUI

Timelapses

Timelapses with Aurora can be tricky because of the extreme changes of brightness due to waxing and waning activity.

Dim aurora during the recovery phase and explosive brightnest during the substorm.

For smooth timelapses that have many dynamic brightness changes, you’re going to want to use LRTimelapse. It’s a paid software that has many amazing features but it’s fairly complicated to use and take a lot of practice.

If it’s not too crazy of a storm, creating time lapses in photoshop or even Quicktime is possible.

Timelapse

Timelapses are very easy to take!

Set intervalometer to your normal settings for whatever lens your using.

Interval should either be 1-2 sec or your shutter speed +1-2 second.

Set number of shots to either unlimited and let the battery die or set a specific number of shots.

Settings

White Balance: either Fluorescent or Kelvin between 3500-4500. Whatever to taste.

Shutter speed: 1-5 seconds. Use the widest aperture lens you have.

3 - 4 seconds is a good all around speed. 10-15 sec may result in very fast aurora movement.

ISO: Depends on current conditions. 6400 for weak storm, 800 or lower for strong storms. Just preserve your highlights. Consider setting up AUTO ISO.

Aperture: as low as you can go you feel is acceptable for the len you're using. Below 2.8 is ideal.

Timelapse

Once finished upload all to lightroom.

Edit one shot to your liking (typically the brightest) and select all other images. Hit the sync button, check all boxes, hit synchronize.

This will copy and paste your edit to every photo you have selected.

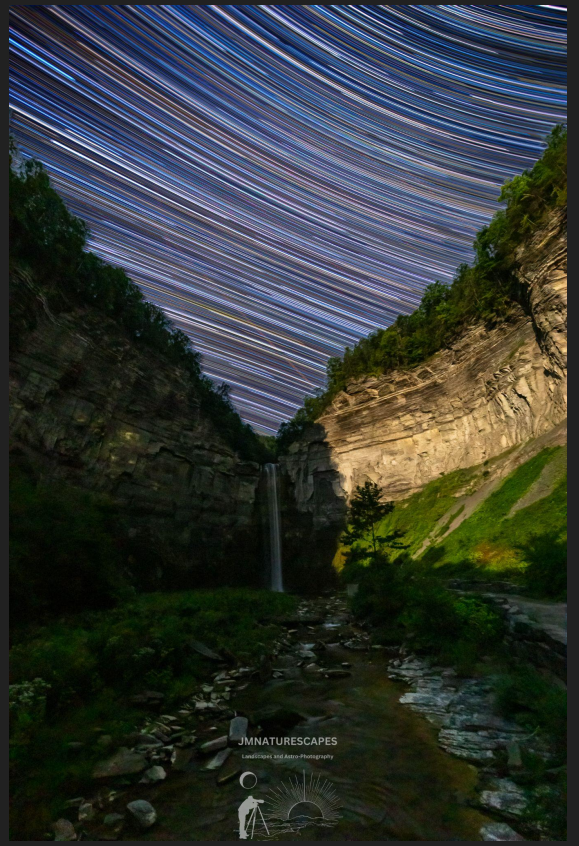
Export all timelapses images as JPGs to their own file.

Open photoshop click File > open. Select the 1st image in the folder and check the image sequence box. Choose your FPS 24/30/60

File > Export > Render Video > Format H.264 > Render

Follow These Directions and You'll Get This

Turn the Time
Lapse into trails
—>



Let move on to showing you the power of Panoramas.

As a thank you for attending, all virtual lesson packages are 15% off online

(code Aurora summit)

All prints 15% off

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Jmnaturescapes.com. Enter the codes at checkout