HDR Photography

When to use it and why you shouldn't!

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HDR Topics

- Just what is HDR?
- History of HDR
- Technical Considerations
- HDR Best Practices
- HDR Examples
- More HDR Examples
- Beyond HDR
- Sample HDR Processing, Native and Plug-in
- Questions

Just What is HDR?

- High Dynamic Range, or HDR, is a technique to extend the dynamic range of imagery that can be obtained from a camera.

- Cameras do not see the world as good as the human eye can
  - Early forms of plate technology cameras – Yes, of course!
  - Film cameras – of course
  - Digital Cameras – even the best digital cameras have limitations!

- HDR is any technique, process, and/or procedure which serves to extend the dynamic range of a camera to more approximate what the human eye can see.

Just What is HDR? … continued

- *“Put simply it is a technique to create images with a higher range of luminosity that can be created with a single standard image.*
- *“In other words, your camera’s sensor or film can capture a specific number tones between pure white and pure black. HDR is a technique to increase that number of tones beyond what can be captured in a single natural shot.*
- *“Generally it is thought that the aim of an HDR images is to bring the tonal range of an image close to what the human eye can see.”*

Source: Lightstalking
https://www.lightstalking.com/story-of-hdr-photography/

HDR has a long history

- HDR began during the early ages of photography.
  - Dynamic range of original photo emulsions were poor
  - Photographers had to come with techniques improve the situation

- Gustave Le Gray's first use of HDR
- Produced a single prints from two differently exposed negatives
  - sky exposure
  - ground exposure
  - "Tone Mapping" enabled Le Gray to handle dynamic range that his film couldn't

Brig upon the water, Albumen print, 1856

Ansel Adams and the Zone System

- Ansel Adams had better equipment, but he had the same problem - how to handle dynamic range?
- Technology and process answers
  - Elaborate exposure procedures
  - Precise film development
  - *Exotic* “dodging and burning” of negatives
- Goal, preserve detail in whites & darks
- The “Zone System” developed by Ansel Adams and Fred Archer
  - Was not just an exposure system
  - It could not be achieved without Ansel Adam’s skill in the darkroom

Source: https://luminous-landscape.com/zone-system/

Ansel Adams, Before and After Image

What About Color?

- Before computers, developing images in the *wet* darkroom…
  - Correcting for luminosity issues in monochrome imagery was possible
    - Laborious and exacting work
    - Time-consuming
  - Correcting for luminosity issues in color imagery was virtually impossible
    - Multiple dye layers and tricky chemicals rendered monochrome techniques useless
    - Dynamic range issues had to be resolved in camera
- With the advent of low-cost computers things changed… sort of
  - Early computers were relatively slow and very expensive
  - No software to manipulate digital imagery
  - Data representation formats did not exist

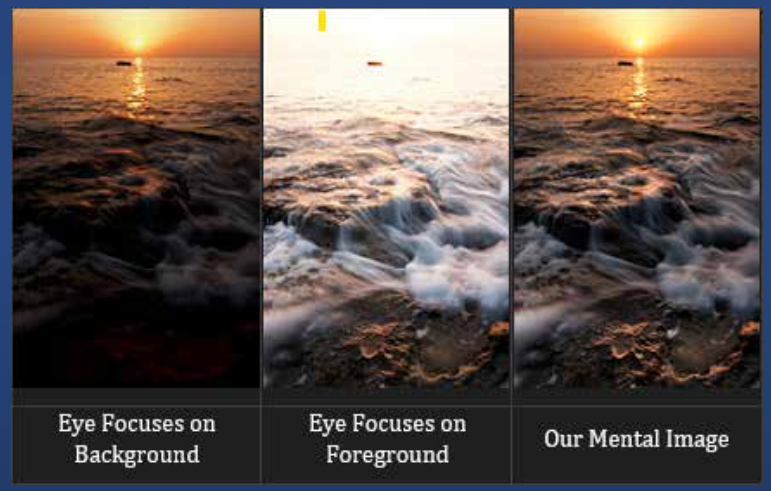
Color and HDR (continued)

- James Ward (Lawrence Berkeley National Laboratory)
  - Developed the concept and data format for digital HDR imaging (1990s)
  - Continued to develop software for HDR manipulation His documentation led to the birth of HDR software
- Many other contributors too, mostly associated with NASA
- Today, several HDR alternatives are available*
  - Photomatix Pro (2003)
  - Photoshop 16/32-bit (2005)
  - Nik HDR Efex Pro (2010)
  - Aurora HDR (2015)
  - Lightroom Photomerge (2015)
  - Windows 10 native app. (2016)
  - On1 HDR (2019)
  - Capture One (2019)

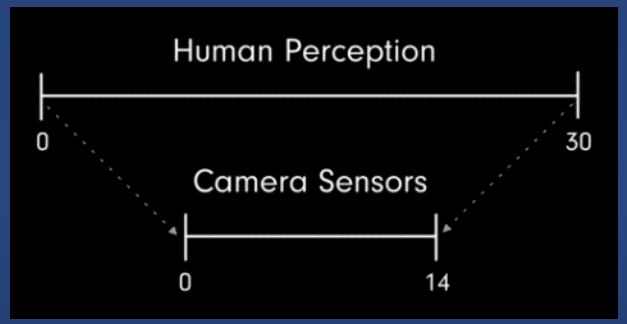
*Dates in parenthesis are feature debut dates. This is not a complete list of HDR programs.

Just why is HDR needed?

- Both cameras and the human eye have about the same capability *visualize* dynamic range… about 10-14 stops.
- However… the camera and the human eye see the world differently:
  - The camera sees the world one image at a time
  - The human eye/brain builds image iteratively, building an integrated view
- Through “instantaneous dynamic range” we see so much more!



Source: *Camera’s vs. the Human Eye*
Cambridge Color



Source: *Dynamic Range & Visual Perception*
James Lorentson

HDR is NOT Alone… Alternatives to HDR

- Basic Adjustments in Lightroom or Adobe Camera Raw
  - Adjusting the dark, light and mid-tones sliders
  - Use of *digital* filters and brushes (with range masking)
    - Adjustment Brush
    - Radial Filter
    - Graduated Filter
- Layers and Masking in Photoshop
- Double Processing and merging Layers in Photoshop
- Luminosity Masking

So, you want to photograph in HDR

- Best Practices for HDR Photography:
  - Set your camera to either Aperture Priority or Manual (Do NOT use S, P or Auto)
  - Take a test shot or two. Check your exposure balance
    – get the best single exposure image you can
    – avoid clipping, especially whites
  - Set bracketing 3, 5 or even 7 exposures, separated by 1 stop
  - Set camera to burst shooting – shoot all exposure in rapid sequence
  - Use a tripod
  - Shoot on a calm and windless day with nothing moving *to avoid ghosting*

- Acceptable Practices – *let the software handle the problems!*
  - Skip the tripod, don't worry about body movement that much (most programs auto-align hand-held bracketed images well)
  - Don't worry too much about the breeze
  - Don't take a test shot first, just bracket everything you shoot

So you want to process your HDR imagery

- Use whatever HDR tool you are comfortable with
  – *and learn how it works*
- Know your goals and work to achieve them
- Consider keeping adjustments simple in the HDR program
  – perform fine adjustments in post
- Don’t lose sight of all the elements of a good image!
  – Realistic or highly stylized
  – use your judgement and sensibilities

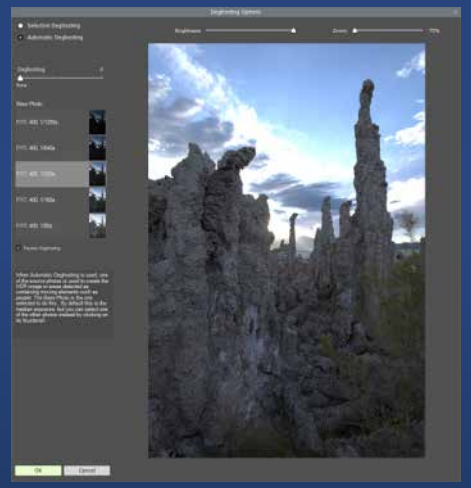
  – Unrealistic HDR is typically not a good choice in photo competitions (except for artistic categories)

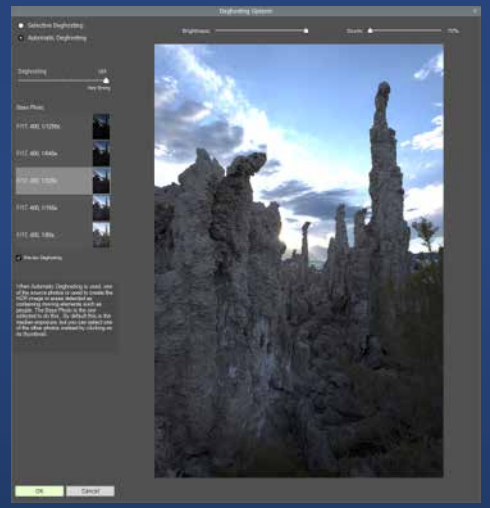
Understand how HDR software works

- Consider keeping adjustments simple in the HDR program
  – Perform adjustments in your native editing program
- In all cases, consider the following:
  - **Saturation** – Keep it reasonable. Don't over-saturate your photo. HDR is about light, not about over-saturation!
  - **Luminosity** – Creates the "painterly effect."
  - **Contrast Detail** – Should feel right. Grungy contrast should fit the subject.
  - **Lighting Adjustments** – Use care not to "Cartoon" or become psychedelic.
  - **White Points & Black Points** – Be careful of clipping highlights and shadows.
    – You will not know until you get back to Lightroom or Photoshop
- If you find yourself with "Halos" you may have gone too far.

Ghosts? Did you say ghosts?

- Ghosting used to be a major problem.
  - Early HDR versions did not handle movement between bracketed scenes
  - This is not such a problem any longer
- Most HDR programs can detect and remove ghosting
  - Some programs allow you to choose which bracket dominates
  - Some programs allow you to control dynamics of ghosting correction
  - Some programs allow you delineate where ghosting should be removed





You May NOT Need HDR Software

- Dynamic range of cameras and sensor technology has improved
  - Early cameras - reviewers didn’t discuss dynamic range in quantifiable terms
  - Today, newer DSLR cameras have phenomenal dynamic range
    - 14.8 EV, Nikon D850, Sony A7 R IV
    - 14.7 EV, Sony A7 R III
    - 14.6 EV, Nikon Z7, Pentax 645 Z
    - 14.5 EV, Canon EOS 1D M III
    - 14.1 EV, Panasonic DC-S1R
    - 13.9 EV, Leica Q2
    - 13.5 EV, Canon EOS 5D M IV
    - 13.2 EV, Canon EOS 80 D
- Most cameras now have in-camera HDR features
  – But, probably render in jpeg only
- Photo-editing software has improved tremendously
  - New features in Lightroom and Adobe Camera Raw
  - Add to that other image enhancement plugins

3 Bracketed Images...

-1 EV

0 EV

+1 EV

Lightroom HDR

PS HDR Pro

Photomatix HDR

Aurora HDR

NOT HDR (from 0 EV)

5 Bracketed Images…

-2 EV

-1 EV

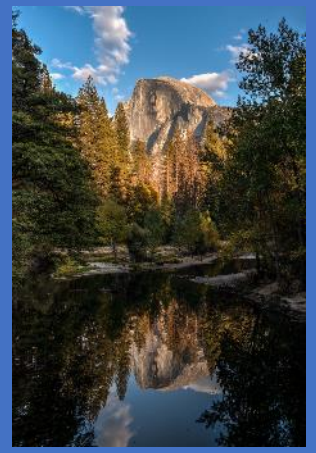
0 EV

+1 EV

+2 EV

Lightroom HDR

PS HDR Pro

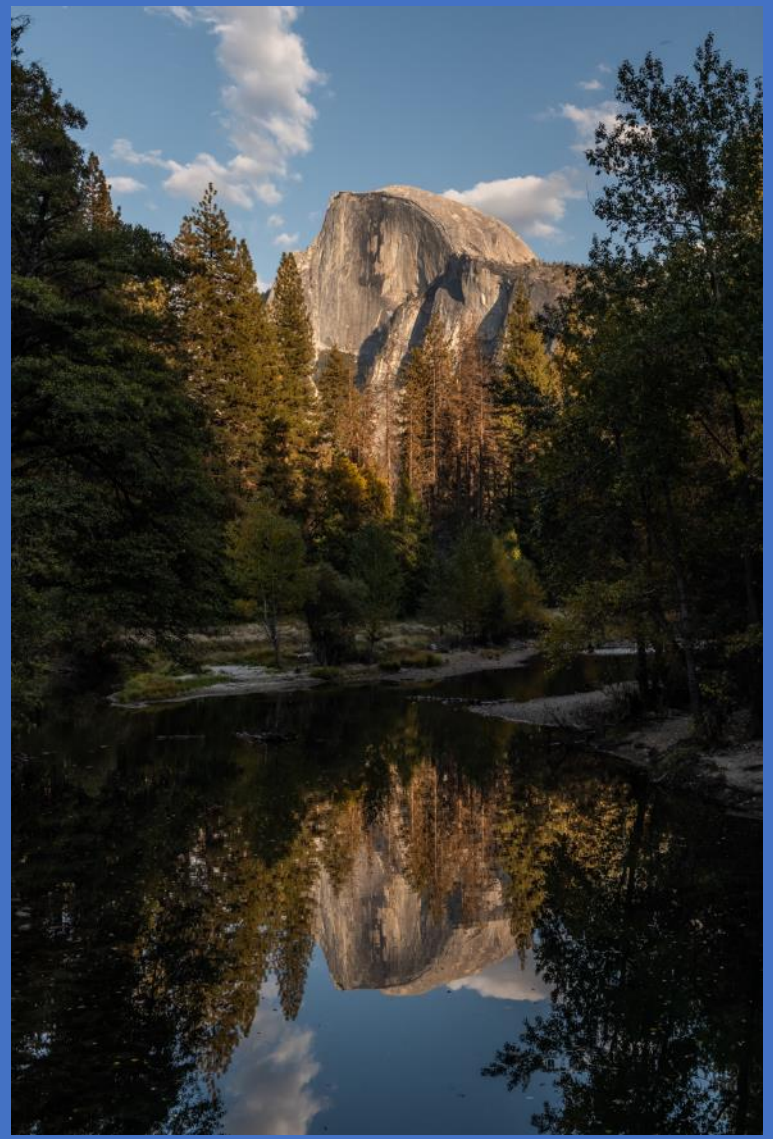


Photomatix HDR

Aurora HDR

NOT HDR (from 0 EV)

One at a time...



Lightroom HDR

One at a time...

Photoshop HDR Pro

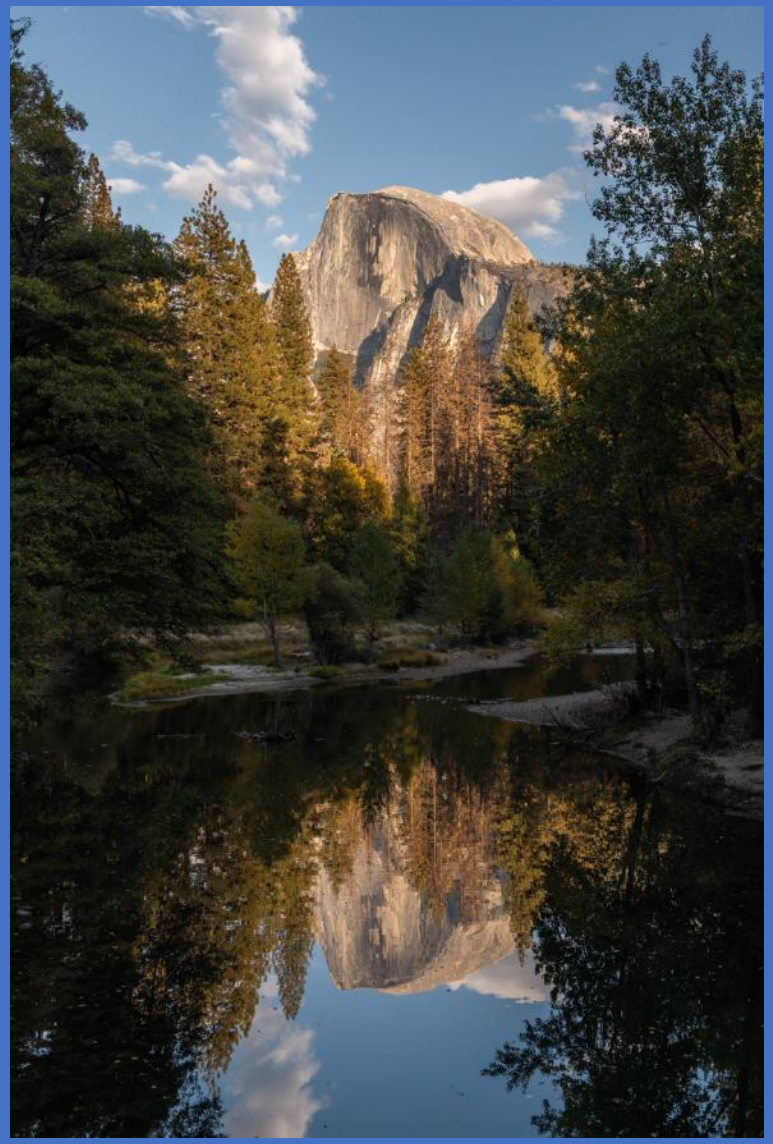
One at a time...

Photomatix Pro

One at a time...

Aurora HDR

One at a time...



Just a single image processed in Lightroom (0 EV)

Interiors: 3 Bracketed Images...

-1 EV

0 EV

+1 EV

Lightroom HDR

PS HDR Pro

Photomatix HDR

Aurora HDR

NOT HDR (from 0 EV)

Into the sun, 5 Bracketed Images...

-2 EV

-1 EV

0 EV

+1 EV

+2 EV

Lightroom HDR

PS HDR Pro

Photomatix HDR

Aurora HDR

NOT HDR

Very Strong Contrast, 5 Bracketed Images…

-2 EV

-1 EV

0 EV

+1 EV

+2 EV

Lightroom HDR

PS HDR Pro

Photomatix HDR

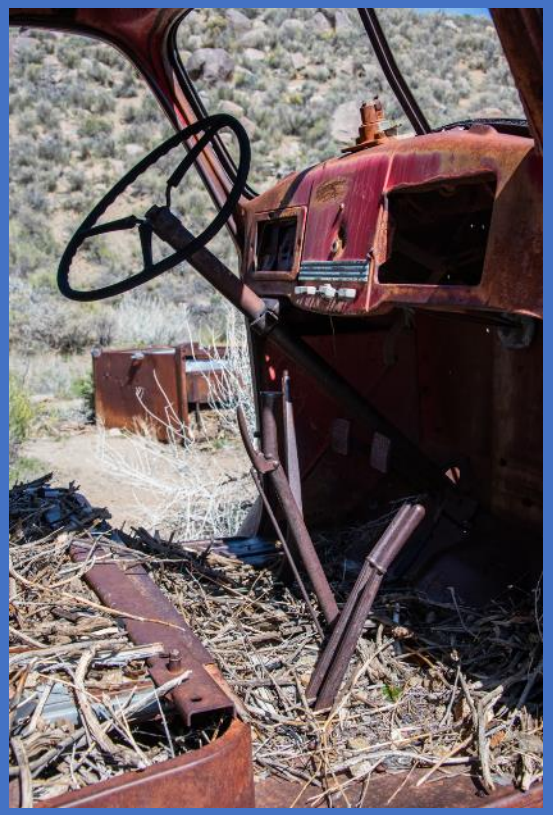
Aurora HDR

NOT HDR

Bring on the grunge

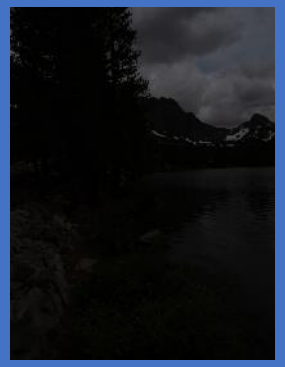
Photomatix HDR

Aurora HDR

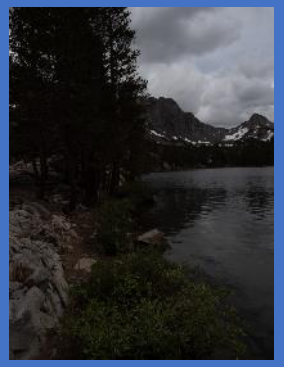


NOT HDR

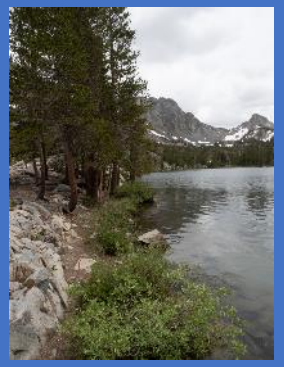
Very Strong Contrast, 5 Bracketed Images…



-4 EV



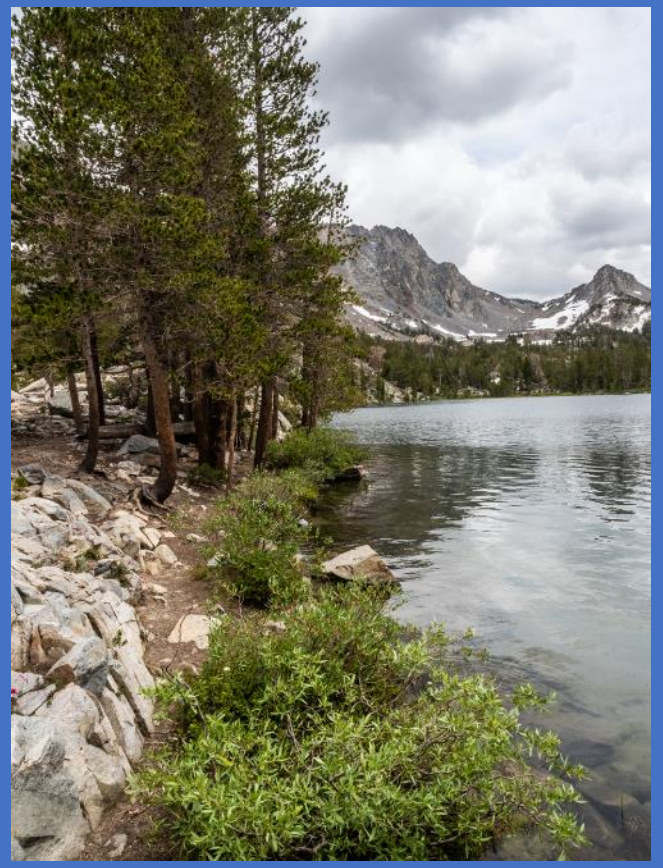
-2 EV



0 EV

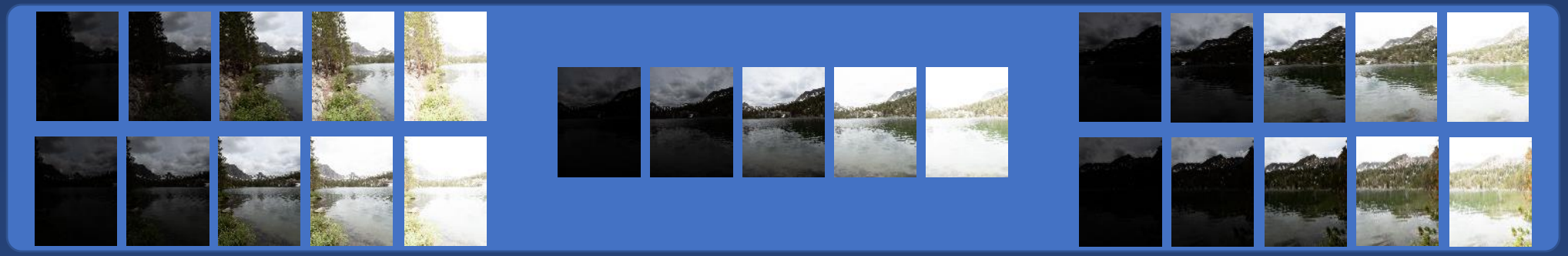
+2 EV

+4 EV



Lightroom HDR

What if you wanted an HDR Panorama?

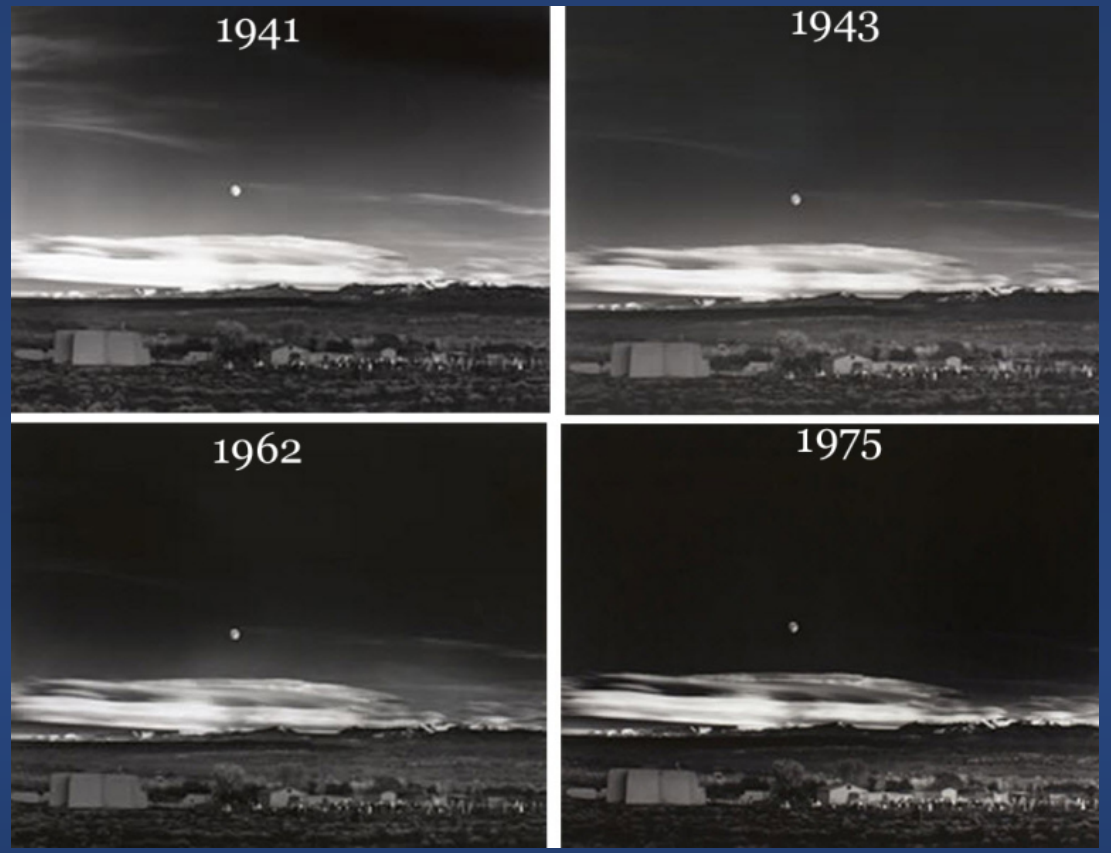


Back to the basics: Monochrome

A Live Demo

- *“You don’t take a photograph, you make it.”*

  Ansel Adams



Source: https://onthisdateinphotography.com/2017/11/01/27190/

Questions