

A brief introduction to

HIGH DYNAMIC RANGE PHOTOGRAPHY

Dave Wilson

<http://www.davewilsonphotography.com>



GREAT LOCATION – TRICKY LIGHTING



Center exposure

GREAT LOCATION – TRICKY LIGHTING



GREAT LOCATION – TRICKY LIGHTING



GREAT LOCATION – TRICKY LIGHTING



GREAT LOCATION – TRICKY LIGHTING



THE EXPOSURE TRADE-OFF

- + Expose for the shadows, blow out the highlights?
- + Expose for the highlights, lose all shadow detail?



OR...

- ✗ Use HDR to achieve something closer to the view you remembered.



WHAT IS HDR?

- ✗ HDR is not just a method of generating funky-looking images.
- ✗ HDR describes a collection of tools and techniques allowing the capture of a wider range of shadow and highlight detail than would be possible using a single exposure on a conventional digital camera.
- ✗ Techniques can be used to generate both artistic and realistic results (though most people only notice the artistic ones).

HDR RESULTS NEEDN'T LOOK “FAKE”



A BIT OF THEORY – DYNAMIC RANGE

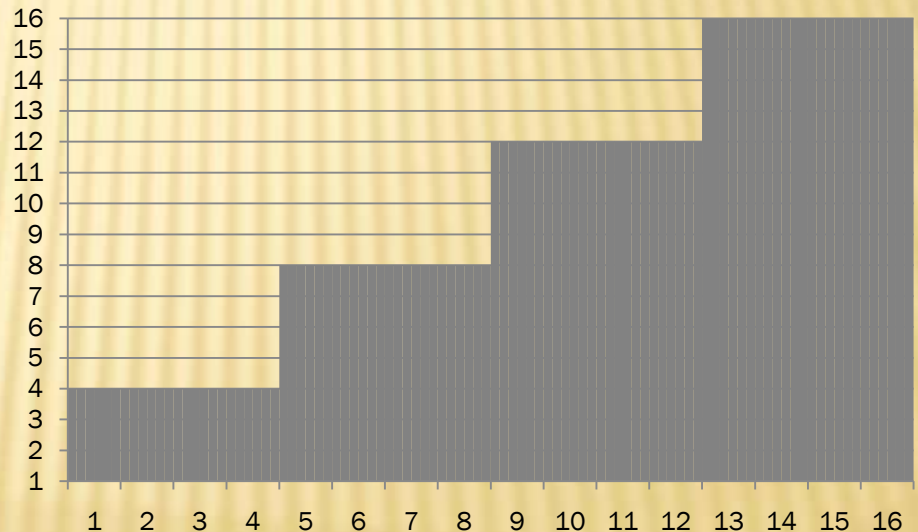
- ✗ A measure of the amount of information in a signal or scene.
- ✗ A measure of the amount of information a sensor can record.
- ✗ The ratio of the highest value a sensor can record divided by the smallest individual step it can detect.
- ✗ Think of this a contrast ratio (as you see in TV advertizing, for example “2000:1”)
- ✗ Measured in decibels or, for photography, bits, stops or EVs.
- ✗ $1 \text{ bit} = 1 \text{ stop} = 1\text{EV}$

DYNAMIC RANGE OF A SENSOR

- A sensor with low dynamic range
 - Few individual measurement values.
 - In this example, maximum 16, minimum step 4.

$$16:4 = 4:1 = 2^2$$

2 bits or 2 stops

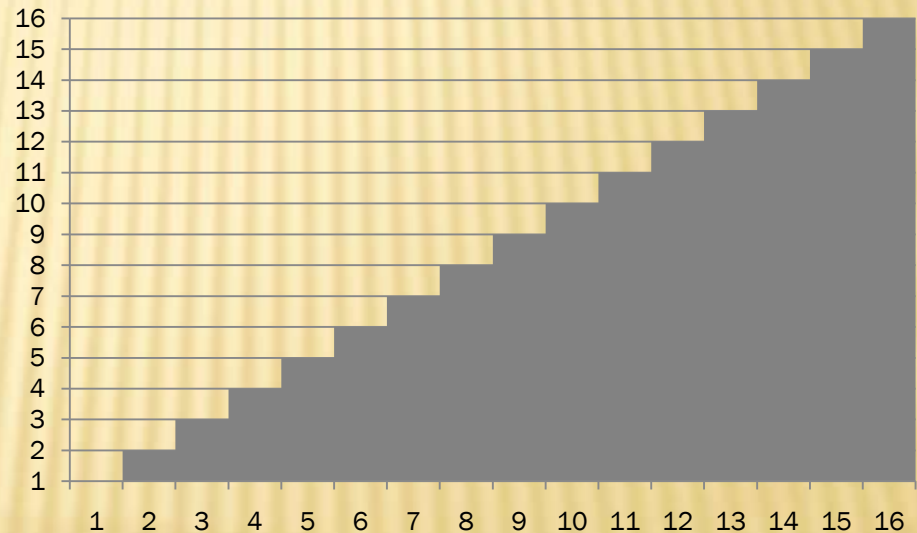


DYNAMIC RANGE OF A SENSOR (2)

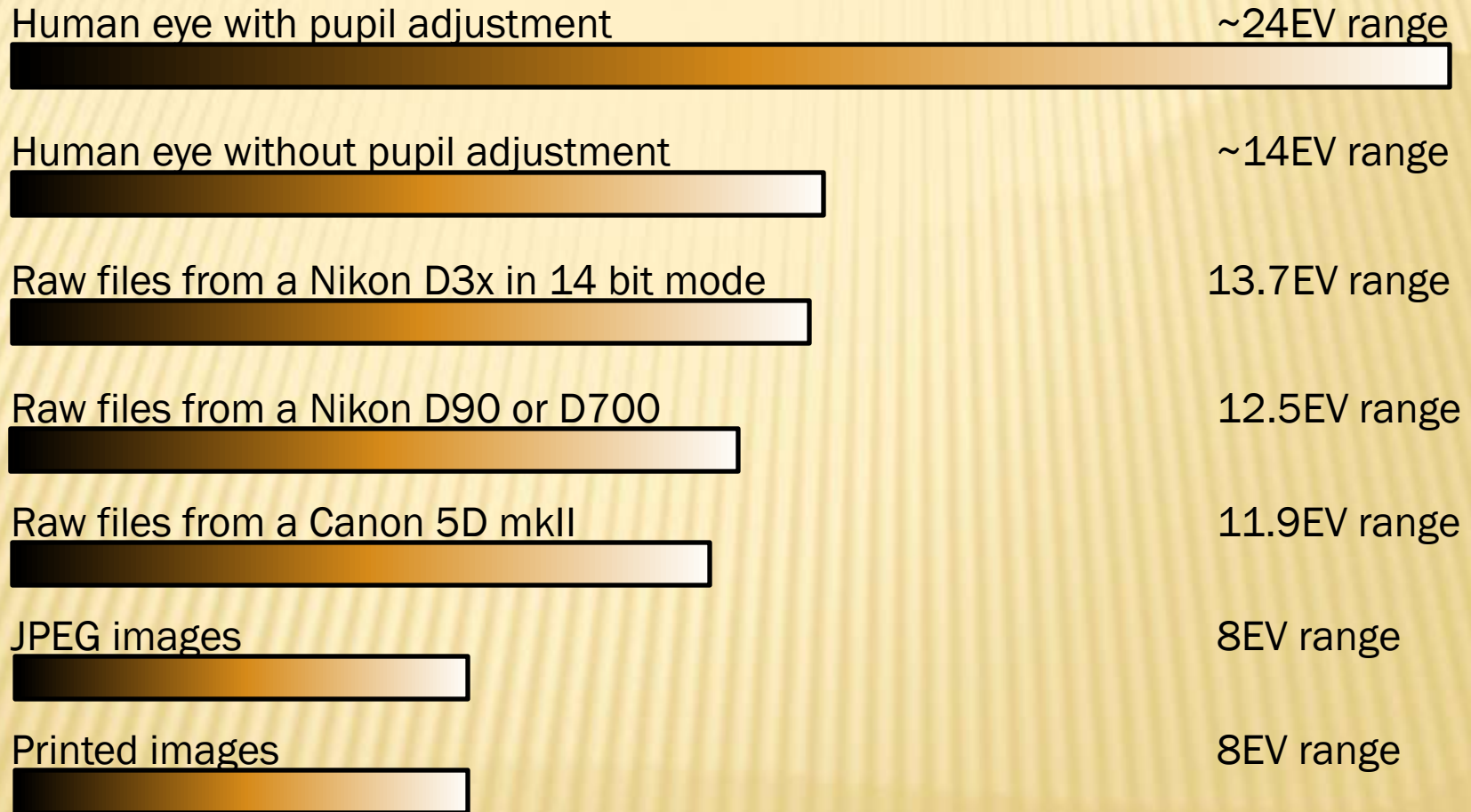
- A sensor with high dynamic range
 - Many individual measurement values.
 - In this example, maximum 16, minimum step 1

$$16:1 = 16 = 2^4$$

4 bits or 4 stops



IN MORE PRACTICAL TERMS...



Source: DxOMark Sensor - <http://www.dxomark.com/index.php/eng/DxOMark-Sensor>

HDR WORKFLOW

- ✖ Shoot a series of bracketed exposures of the same scene.
- ✖ Merge those exposures into a single high dynamic range file using software.
- ✖ “Tone map” the HDR image back into the lower dynamic range of your output medium (usually the screen).
- ✖ This may sound complex but it’s actually very easy.

EQUIPMENT REQUIREMENTS

- ✗ A camera supporting Aperture Priority or Manual exposure mode.
- ✗ A tripod.
- ✗ Auto exposure bracketing (preferred) or exposure compensation adjustment.
- ✗ RAW image capture (preferred).

SHOOTING FOR HDR

- ✗ Stabilise your camera using a tripod.
- ✗ Select Aperture Priority mode and your aperture of choice.
- ✗ Take 3 exposures of the scene at -2EV, 0EV and +2EV.
- ✗ Check the histograms and take further brackets if necessary to capture shadow or highlight detail.

EXPOSURE BRACKETS

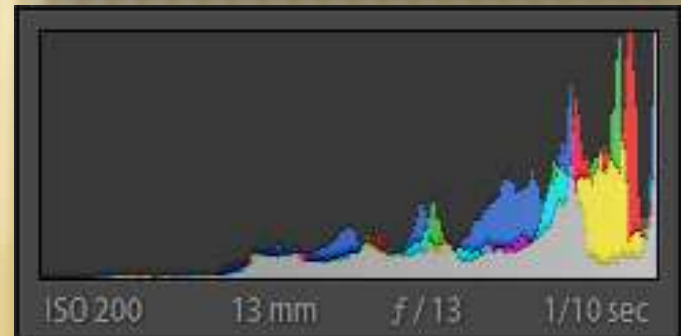
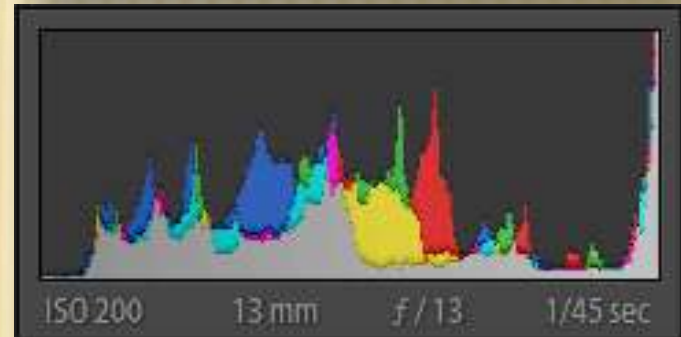
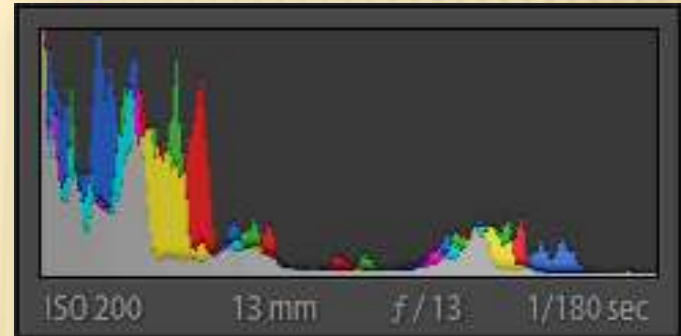
2 stops
underexposed



Normal
exposure



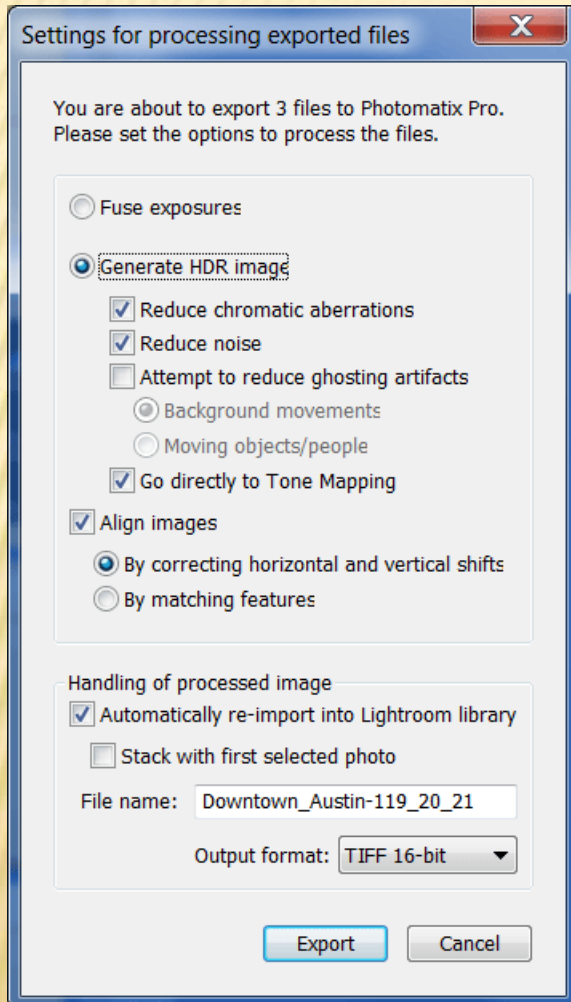
2 stops
overexposed



MERGING YOUR FRAMES

- ✗ Various software tools exist to merge your bracketed images into a single HDR file.
- ✗ I use HDRSoft Photomatix Pro
 - + Mac and Windows versions, 32 and 64 bit.
 - + \$99 for full version, \$39 for Lite version.
 - + Free trial download.
 - + Includes an export module for Lightroom.
- ✗ Use code “DaveWilson” to get a 15% discount.

EXPORT FROM LIGHTROOM

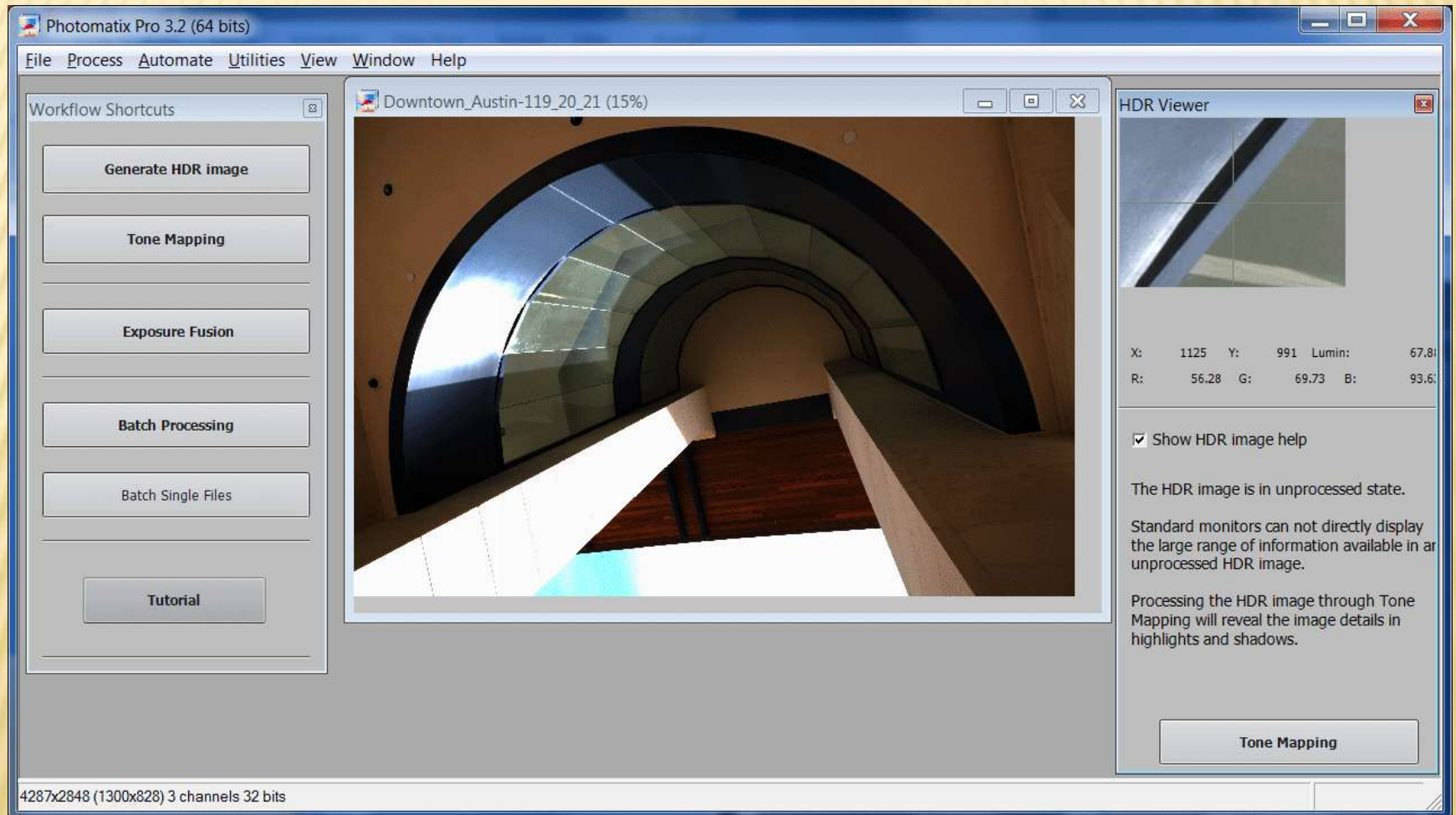


1. Select the bracketed exposures in Lightroom.
2. Right click on one and chose “Export/Photomatix Pro.”
3. Choose your desired operations in the settings dialog box.
4. Press “Export”.

Lightroom will render your raw files and pass them to Photomatix for merging into a single HDR file.

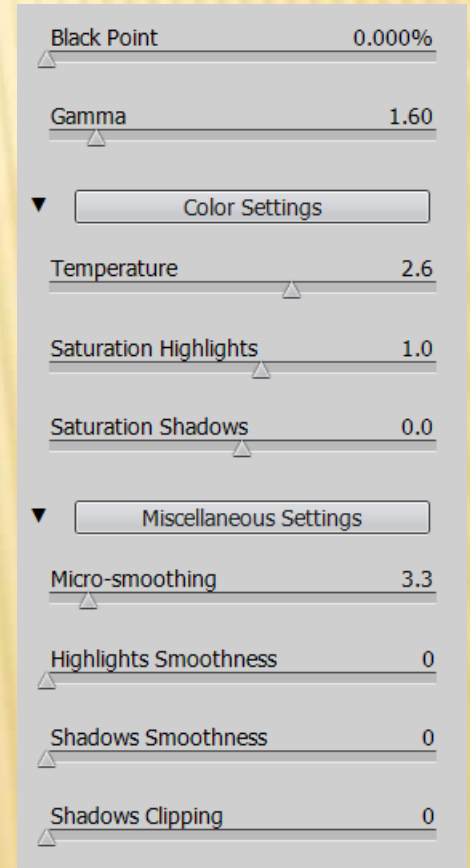
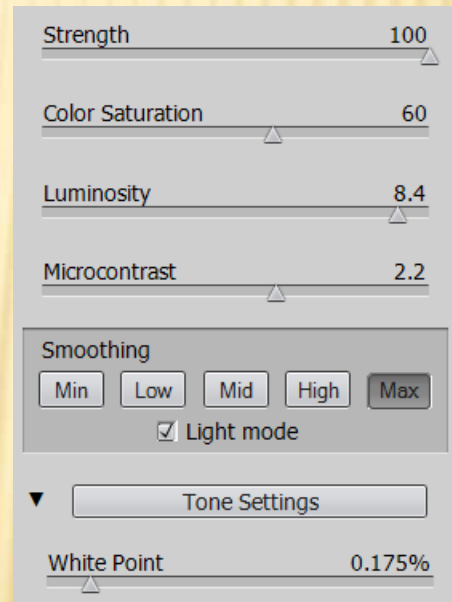
Alternatively, you may open the raw files directly in Photomatix but this will yield a lower quality result since Lightroom’s raw processor is superior to Photomatix.

PHOTOMATIX WITH HDR IMAGE DISPLAYED

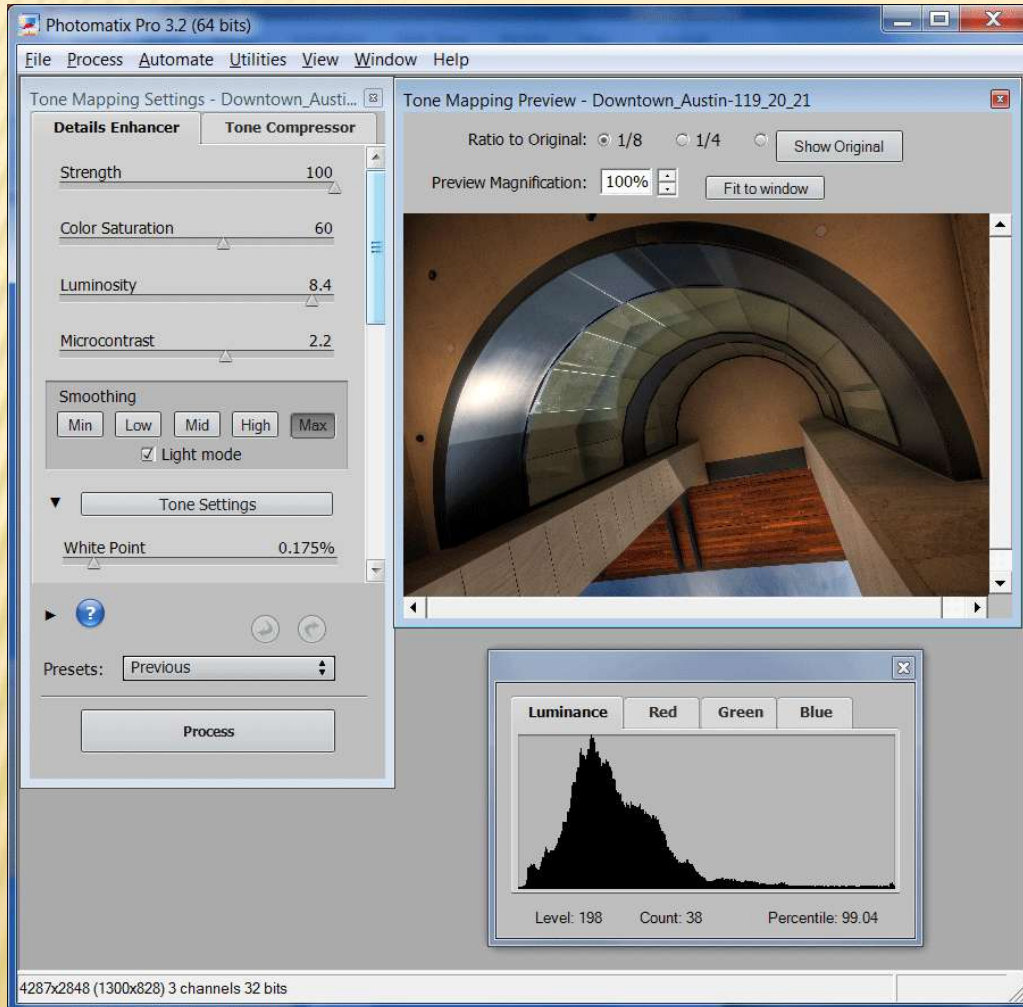


TONE MAPPING IN PHOTOMATIX

- This is the creative part of the process.
- Tone mapping converts your 32 bit HDR image back to the 8 or 16 bit format required for display and printing.
- Sliders control various aspects of the conversion. Most important controls are:
 - Strength
 - Luminosity
 - Microcontrast
 - Smoothing
 - Gamma
 - Micro-smoothing



tone mapping in photomatix (2)



While you are setting your tone mapping controls, Photomatix shows a quick render of the result.

Note that this is not exactly what the final outcome will look like but it's pretty close.

When you have settings you are happy with, press "Process" to render the final image and, if you exported from Lightroom, import the result back into your library.

SLIDESHOW...

HDR SOFTWARE

- ✗ HDRSoft Photomatix Pro (<http://www.hdrsoft.com>)
- ✗ Adobe Photoshop (CS2 or later)
- ✗ Ariea HDR Max (<http://www.ariea.com>)
- ✗ HDR Darkroom (<http://www.hdrdarkroom.com>)
- ✗ FDRTools (<http://www.fdrtools.com>)
- ✗ Artizen HDR (<http://www.supportingcomputers.net>)
- ✗ NIK HDR Efex Pro (<http://www.niksoftware.com>)

I have used the top 4 tools and read good reviews of the next 2. Artizen HDR And FDRTools appear to be a favourites of people who are looking for “realistic” results. NIK HDR Efex Pro was announced yesterday and will be available in October.

RECOMMENDED HDR BOOKS

- ✗ “The HDRI Handbook” (Christian Bloch)
- ✗ “Practical HDR” (David Nightingale)
- ✗ “Complete Guide to High Dynamic Range Digital Photography” (Ferrell McCollough)
- ✗ “A World in HDR” (Trey Ratcliff)
- ✗ “The Color of Loss” (Dan Burkholder)

RECOMMENDED HDR TUTORIALS

- ✖ My own 5 part HDR tutorial:
 - + <http://davewilsonphotography.com/tutorials/>
- ✖ Trey Ratcliff (StuckInCustoms):
 - + HDR travel photography
 - + <http://www.stuckincustoms.com/hdr-tutorial/>
- ✖ Pete Carr (VanillaDays)
 - + Great use of HDR with realistic results.
 - + http://www.vanilladays.com/hdr_tutorial/
- ✖ Luminous Landscapes
 - + Using Photoshop for HDR processing
 - + <http://www.luminous-landscape.com/tutorials/hdr.shtml>

HDR WORKSHOP – AUSTIN, OCTOBER 16, 2010

- ✕ Dragonfly Gallery, Austin
- ✕ Introduction to HDR Photography.
- ✕ Full day, hands-on – shoot and process.
- ✕ More details at <http://davewilsonphotography.com/workshops>