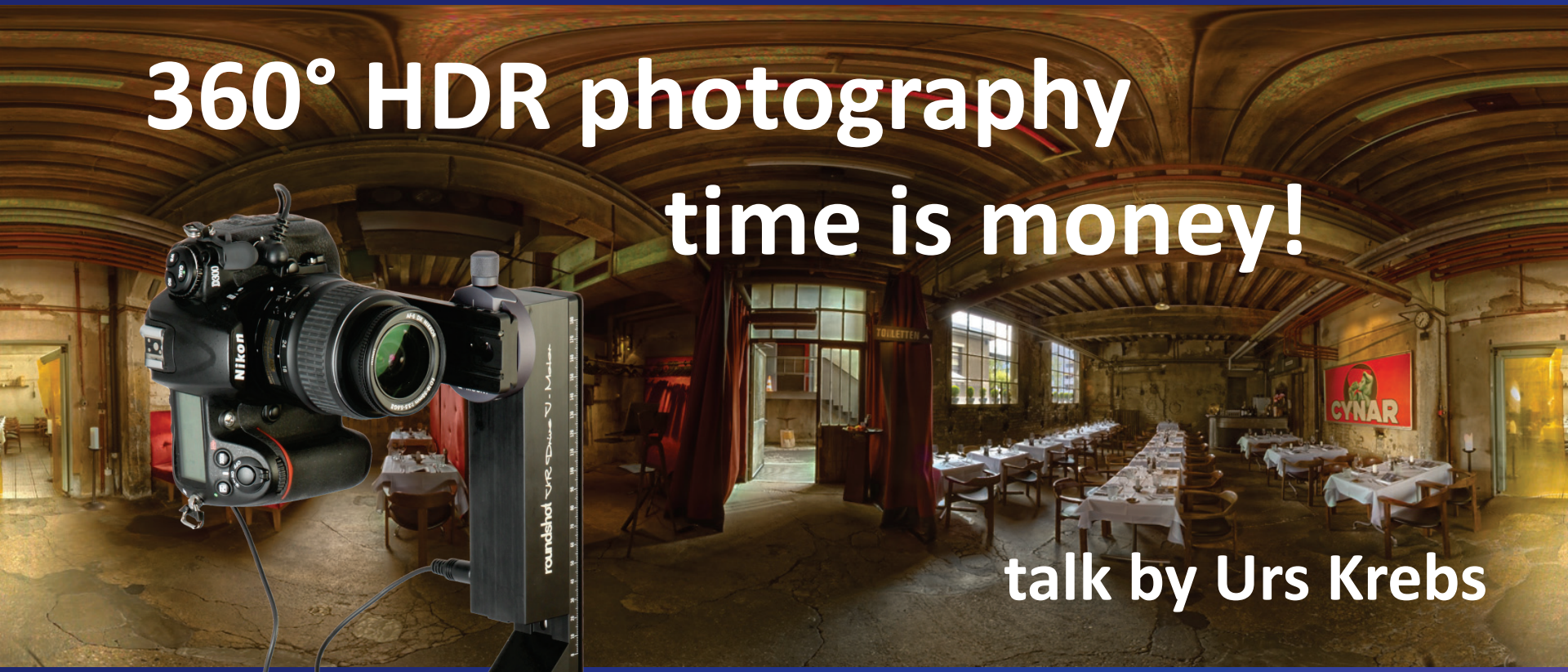
360° HDR photography
time is money!



talk by Urs Krebs

NYC 2012.org
The International Panoramic Photography Conference

Friday, 15 June 2012

roundshot
fast 360 degree panoramic equipment

The 32-bit HDR workflow

- What is a 32-bit HDRi and what is it used for?
- How are the images captured?
- How is the 32-bit HDR file created?
- What are the best options for tone-mapping it into 16-bit or 8-bit?

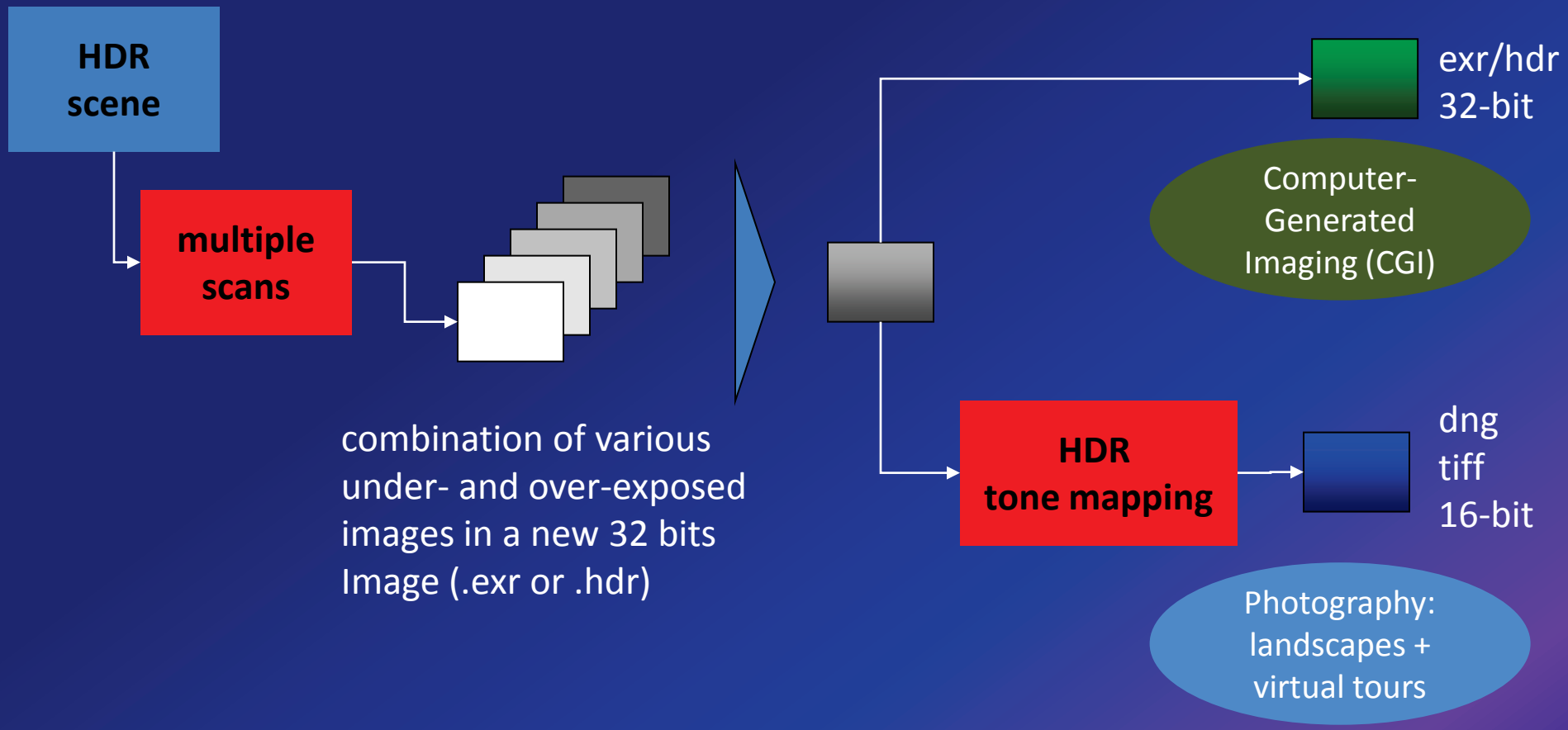
roundshot
fast 360 degree panoramic equipment

The 32-bit HDR workflow

What is a 32-bit HDRi and what is it used for?

roundshot
fast 360 degree panoramic equipment

32-bit HDR spherical VRs (180x360°)



roundshot
fast 360 degree panoramic equipment

32-bit HDR for CGI - examples

roundshot
fast 360 degree panoramic equipment

32-bit HDR for CGI - examples

roundshot
fast 360 degree panoramic equipment

32-bit HDR for CGI - examples

Q-spheres
Real life locations for 3D

roundshot
fast 360 degree panoramic equipment

32-bit HDR for CGI - examples

Q-spheres
Real life locations for 3D

roundshot
fast 360 degree panoramic equipment

32-bit HDR for photography: landscapes

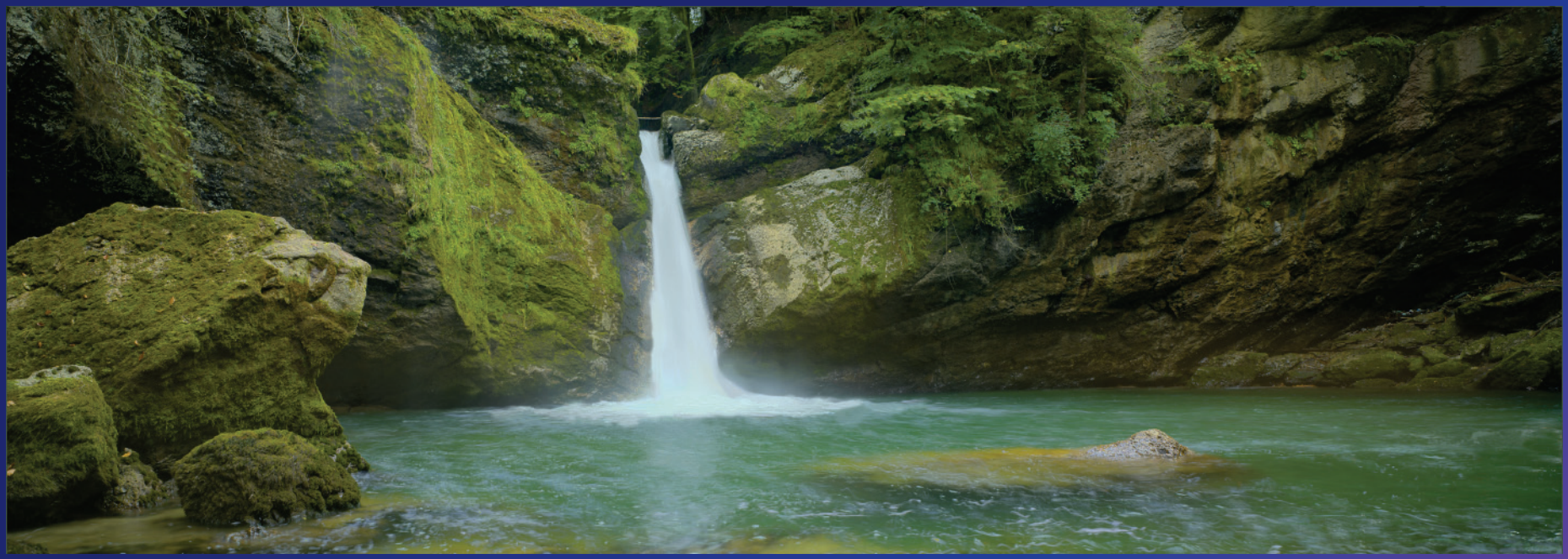
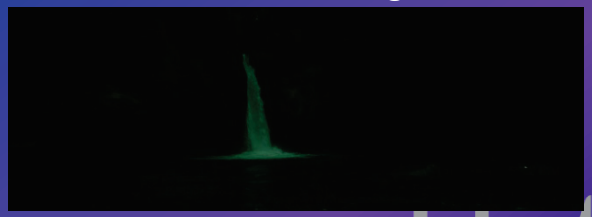


Image: Urs Krebs



roundshot
fast 360 degree panoramic equipment

32-bit HDR for photography: Virtual tours

Image: Urs Krebs

roundshot
fast 360 degree panoramic equipment

The 32-bit HDR workflow

How are the images captured?

roundshot
fast 360 degree panoramic equipment

Capturing hundreds of bracketed images is painful…

… but there is a solution for this…

roundshot
fast 360 degree panoramic equipment

The VR Drive lets you create…

- Digital panoramas:
  - cylindrical
  - spherical (180 x 360°)
- Gigapixel panoramas
- Video sweeps
- Object movies

- 32-bit HDR capture

roundshot
fast 360 degree panoramic equipment

… with various software options

“quality”

“speed”

“video”

“turntable”

“HDR”

roundshot
fast 360 degree panoramic equipment

The challenge:

+ / - 2 EV bracketing limit for most DSLRs!

roundshot
fast 360 degree panoramic equipment

VR Drive HDR mode

- Controls camera software directly
- Overrides exposure, f-stop, ISO/ASA… to overcome the bracketing limitation
- Allows virtually unlimited bracketing and dynamic range!

roundshot
fast 360 degree panoramic equipment

VR Drive HDR mode: Ø exposure

roundshot
fast 360 degree panoramic equipment

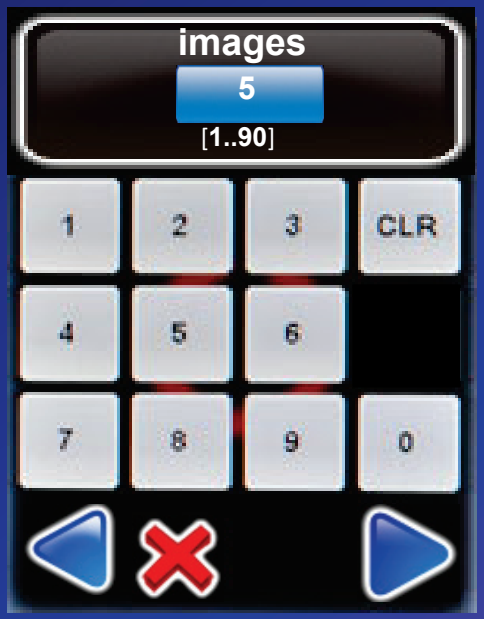
VR Drive HDR mode: f-stop

roundshot
fast 360 degree panoramic equipment

VR Drive HDR mode: ISO/ASA

roundshot
fast 360 degree panoramic equipment

VR Drive HDR mode: # images

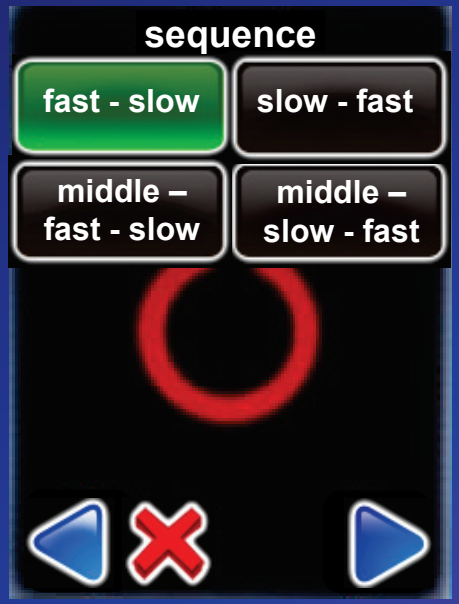


roundshot
fast 360 degree panoramic equipment

VR Drive HDR mode: apert. steps

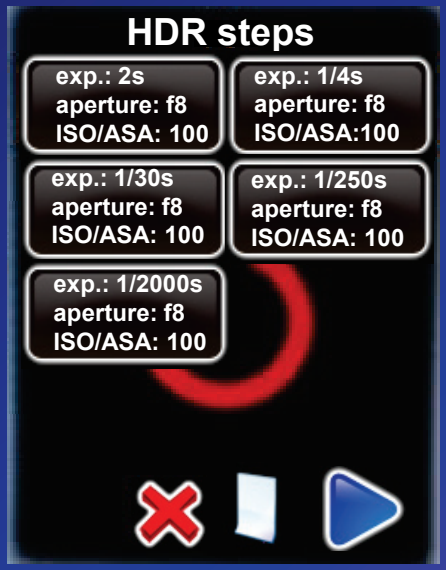
roundshot
fast 360 degree panoramic equipment

VR Drive HDR mode: sequence



roundshot
fast 360 degree panoramic equipment

VR Drive HDR mode: HDR table



roundshot
fast 360 degree panoramic equipment

Very fast + automated image capture

Example Nikon D300 with 10.5mm fisheye lens:

- **2 rows at +45° / -45°**
- **6 positions per row**
- **5 exposures per position**
- **total 60 images**

Total capture time: 3 min. 30 seconds

roundshot
fast 360 degree panoramic equipment

Some other nice features…

- f-stop compensation
- out of range warning
- asymmetrical bracketing
- shifting of Ø exposure
- expansion of bracketing

roundshot
fast 360 degree panoramic equipment

Comparison with manual bracketing

- All through one single device
- Camera control from VR Drive – overrides +/- 2 EV limitation
- No touching of camera!
- No errors!
- Repeatable!

roundshot
fast 360 degree panoramic equipment

VR Drive HDR mode: Time Is Money!

Full HDR capture in 3-5 minutes depending on camera/lens combination

roundshot
fast 360 degree panoramic equipment

The 32-bit HDR workflow

How is the 32-bit HDR file created?

roundshot
fast 360 degree panoramic equipment

Several solutions possible

HDR mix on individual raw images → **Stitching** → **Tone-mapping**

PhotoMatix | AutoPano | PhotoMatix , AutoPano, Photoshop

Raw conversion + stitching + HDR mix → **Tone-mapping**

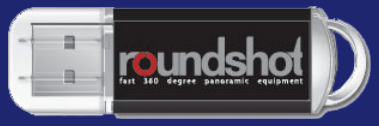
AutoPano | PhotoMatix , AutoPano, Photoshop

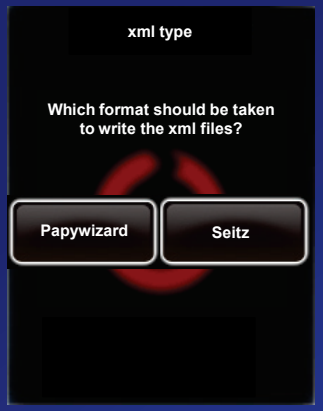
Raw conversion on individual images → **Stitching + HDR mix** → **Tone-mapping** (Chosen path)

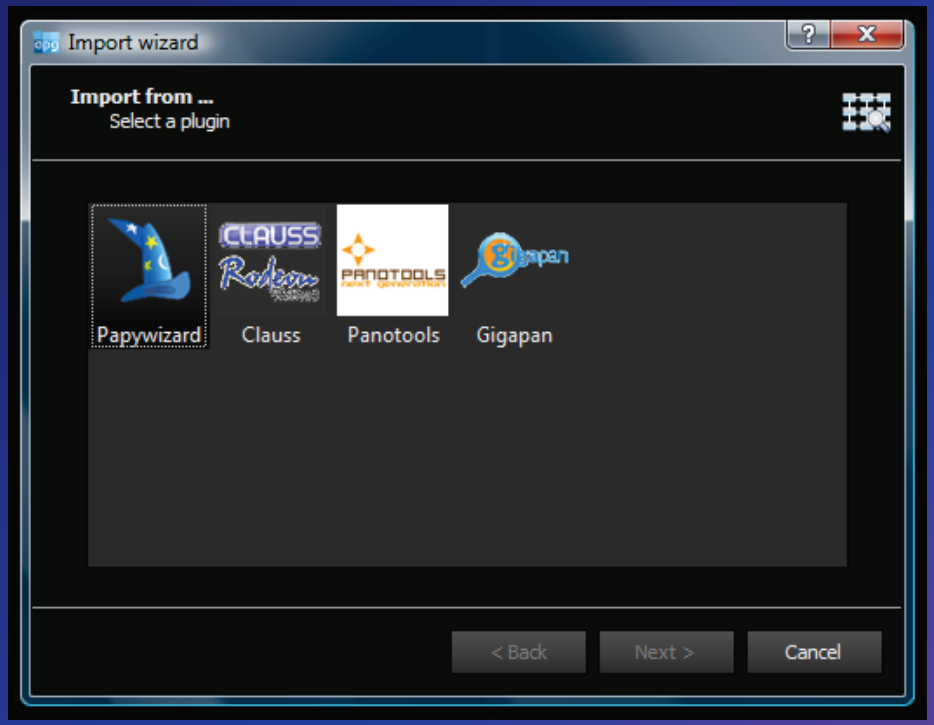
Photoshop camera raw | AutoPano | PhotoMatix , AutoPano, Photoshop

roundshot
fast 360 degree panoramic equipment

xml file enhances stitching accuracy…

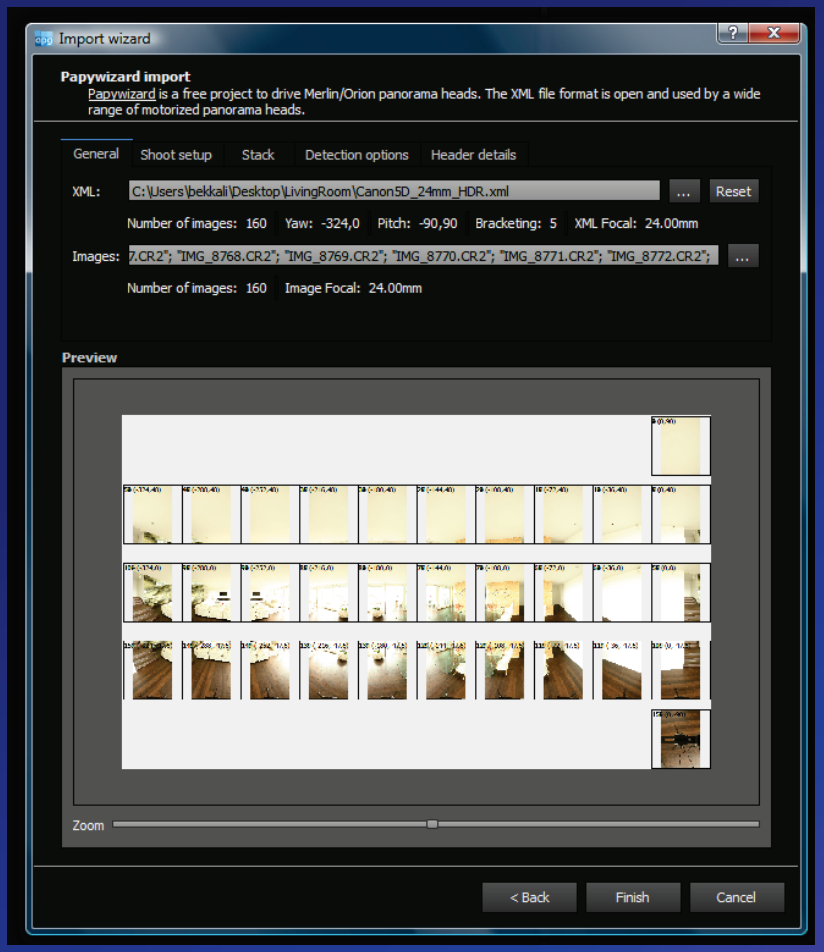






roundshot
fast 360 degree panoramic equipment

… by defining every image position



Benefit:
xml file defines Exact position of every image which helps to improve stitching quality for areas without features (sky, walls…)

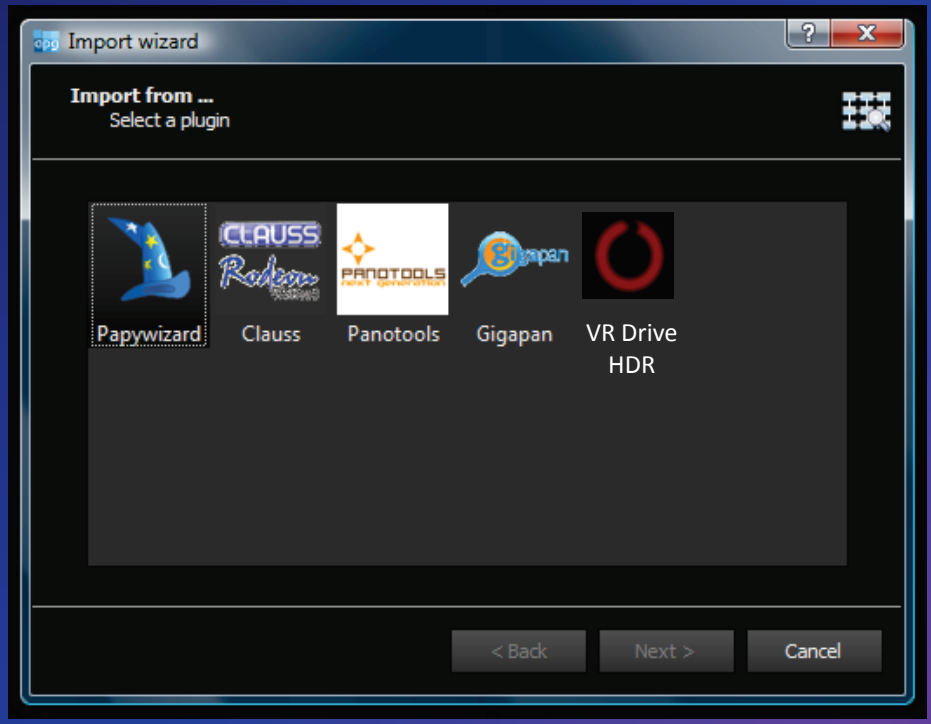
roundshot
fast 360 degree panoramic equipment

New VR Drive HDR plugin for AutoPano!

COMING SOON!

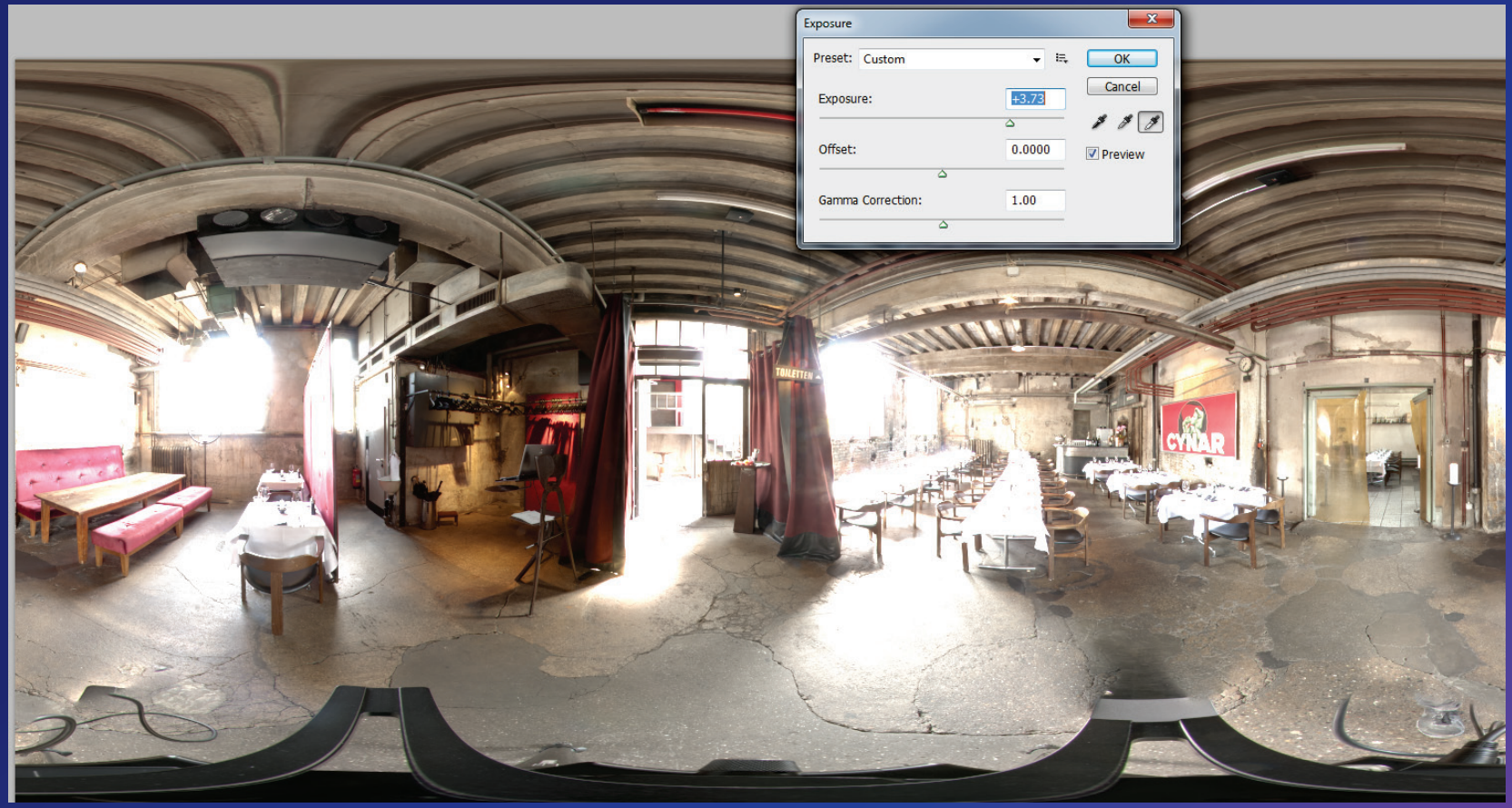
Automatically …

- sets all options for 32-bit HDR correctly (colour, layers…)
- detects medium exposure (will be added to Roundshot xml file)



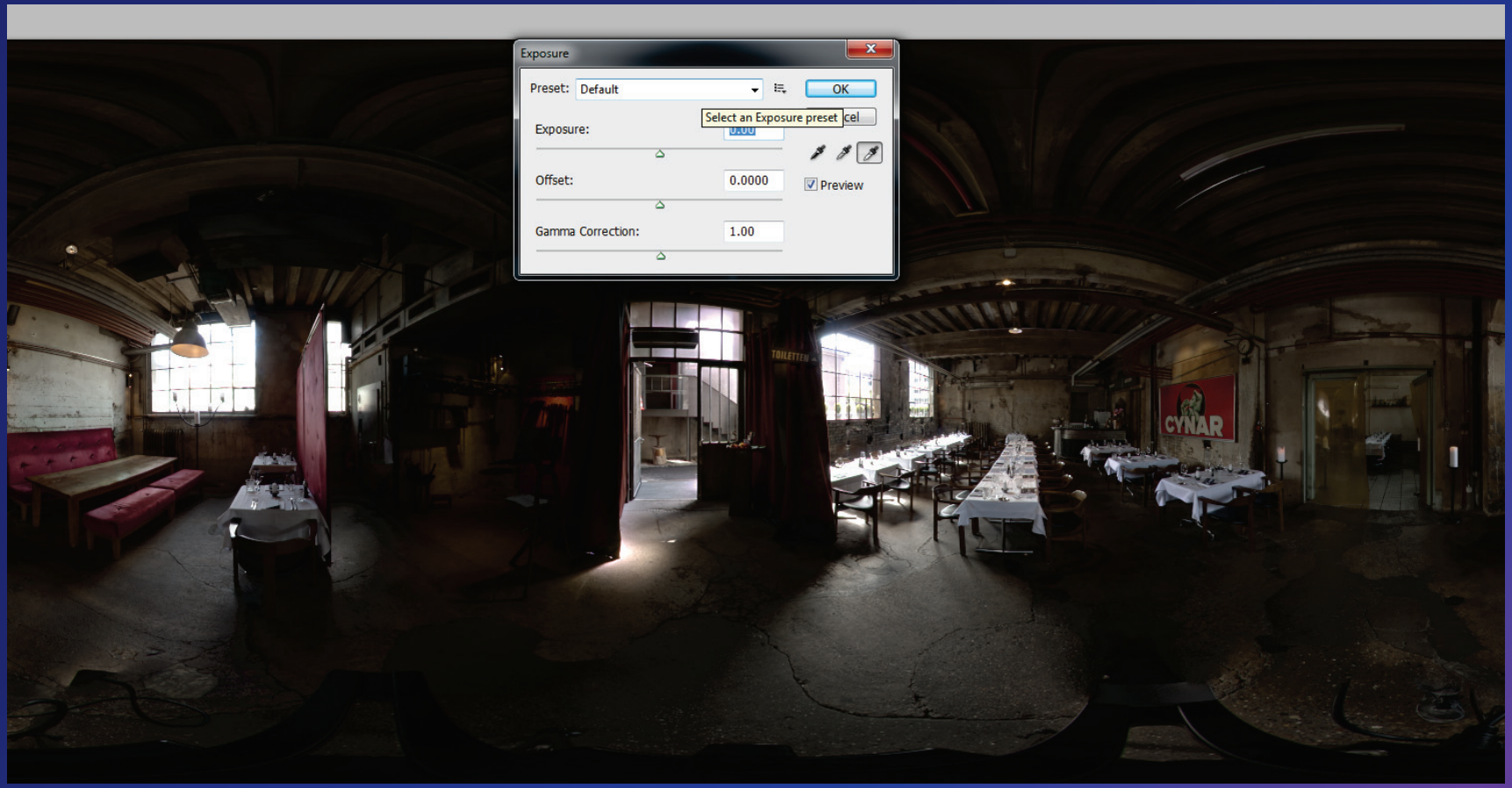
roundshot
fast 360 degree panoramic equipment

Results… see all details in the dark…



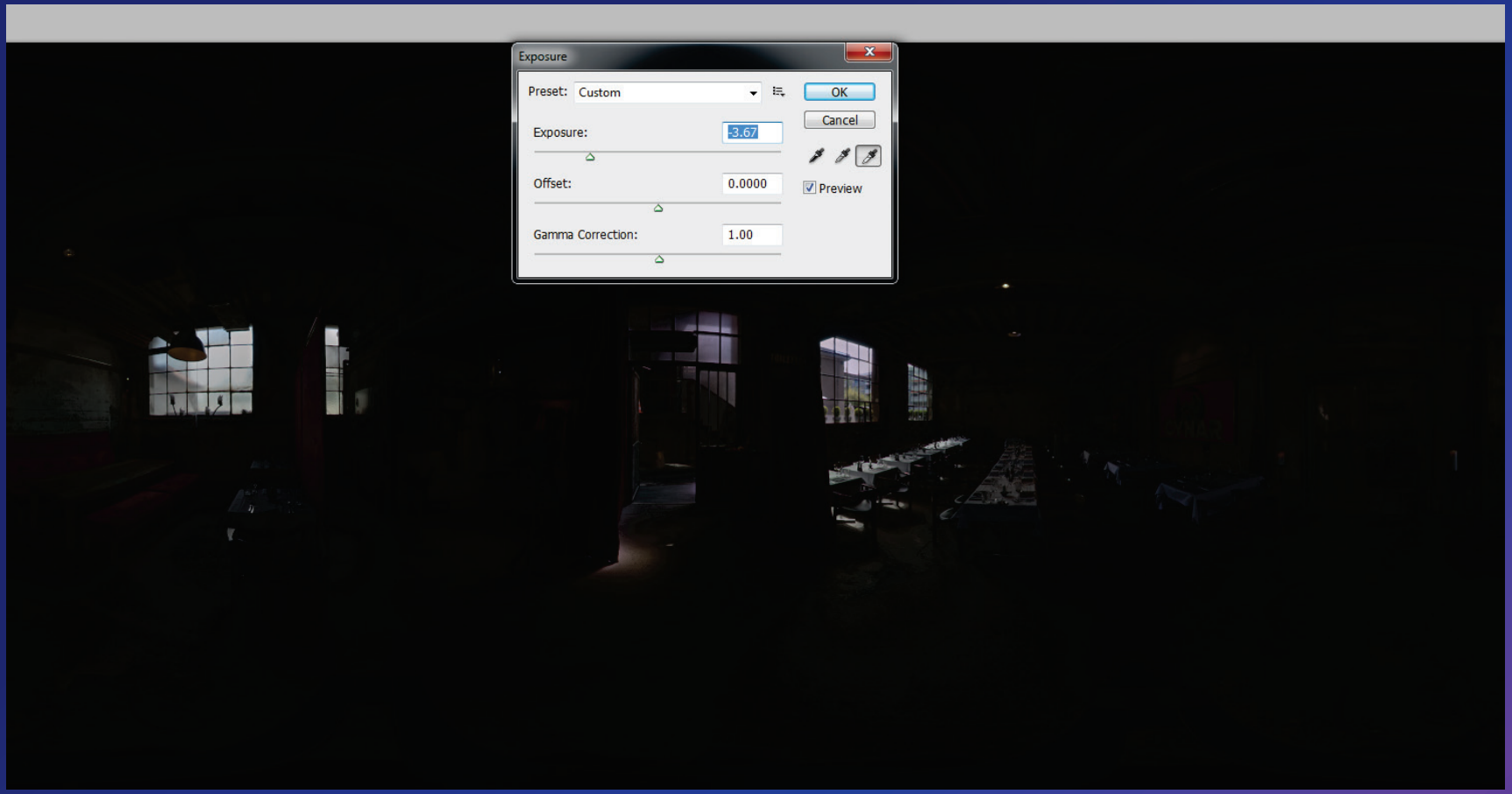
roundshot
fast 360 degree panoramic equipment

… as well as …



roundshot
fast 360 degree panoramic equipment

… in the bright sky



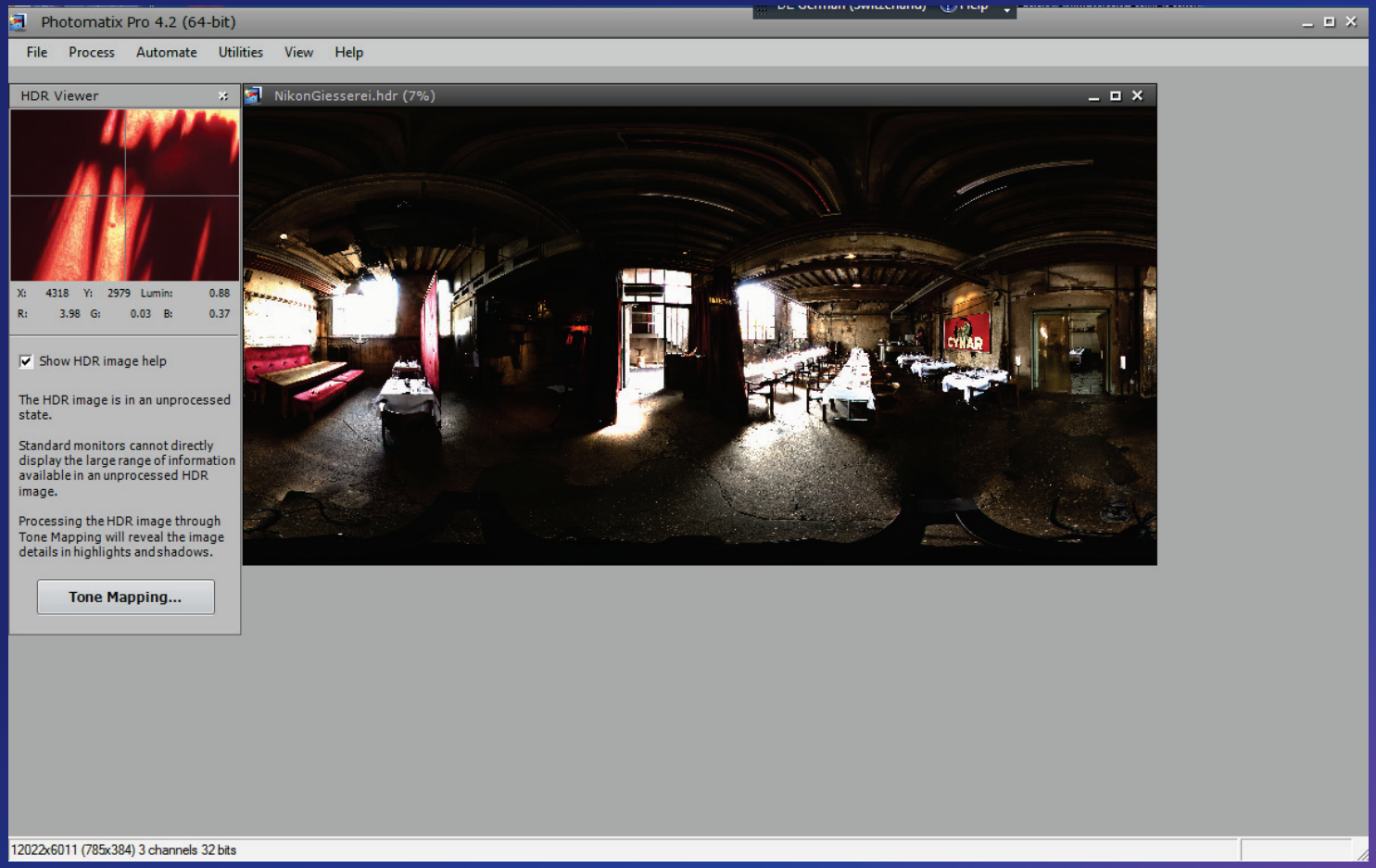
roundshot
fast 360 degree panoramic equipment

The 32-bit HDR workflow

What are the best options for tone-mapping it into 16-bit or 8-bit?

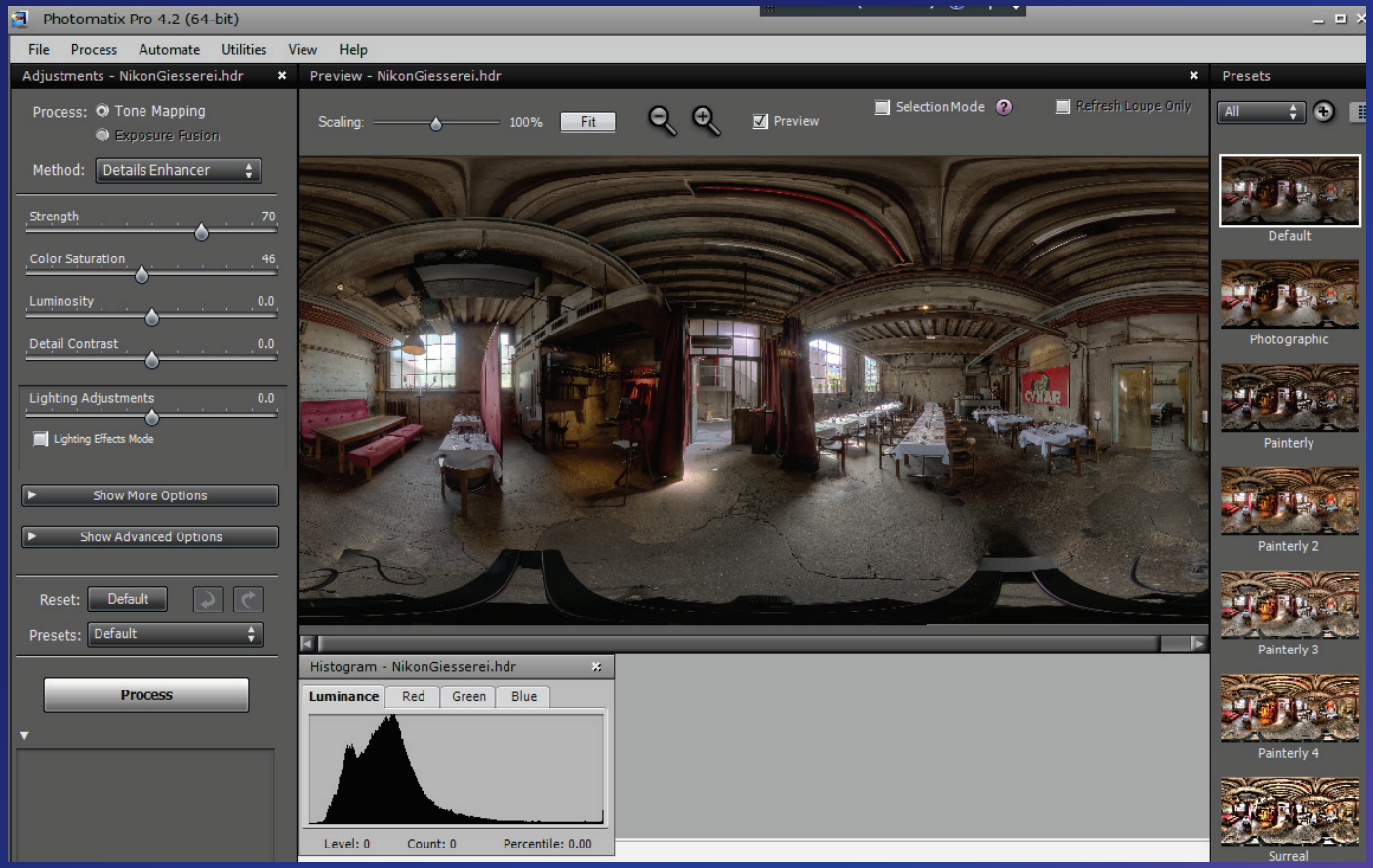
roundshot
fast 360 degree panoramic equipment

Tone-mapping with PhotoMatix 32-bit HDR linear image



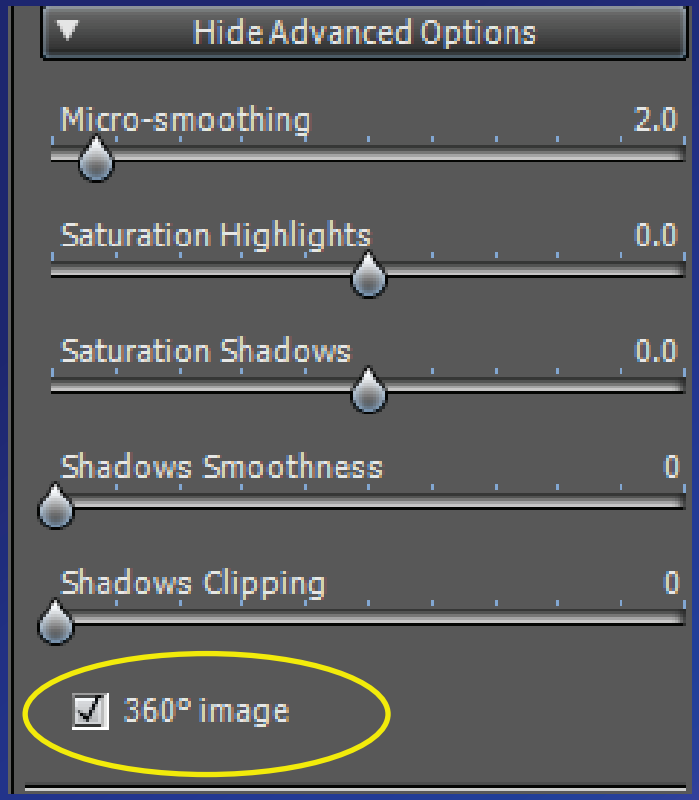
roundshot
fast 360 degree panoramic equipment

Tone-mapping with PhotoMatix Options



roundshot
fast 360 degree panoramic equipment

Tone-mapping with PhotoMatix
Check 360° image



roundshot
fast 360 degree panoramic equipment

Tone-mapping with PhotoMatix
Example 1: colourful

roundshot
fast 360 degree panoramic equipment

Tone-mapping with PhotoMatix
Example 2: painting

roundshot
fast 360 degree panoramic equipment

Tone-mapping with PhotoMatix
Example 3: photorealistic

roundshot
fast 360 degree panoramic equipment

The 32-bit HDR workflow main take-aways

- **Use a fast and reliable capture device!**
  With VR Drive: < 5 minutes!

roundshot
fast 360 degree panoramic equipment

The 32-bit HDR workflow main take-aways

- Test & train your workflow, make it repeatable and dependable before going on assignment

roundshot
fast 360 degree panoramic equipment

The 32-bit HDR workflow main take-aways

- Make sure to render only at the resolution required

(… or use a very very very VERY fast computer!!!)

roundshot
fast 360 degree panoramic equipment

Thank you very much!

NYC 2012.org
The International Panoramic Photography Conference

roundshot
fast 360 degree panoramic equipment