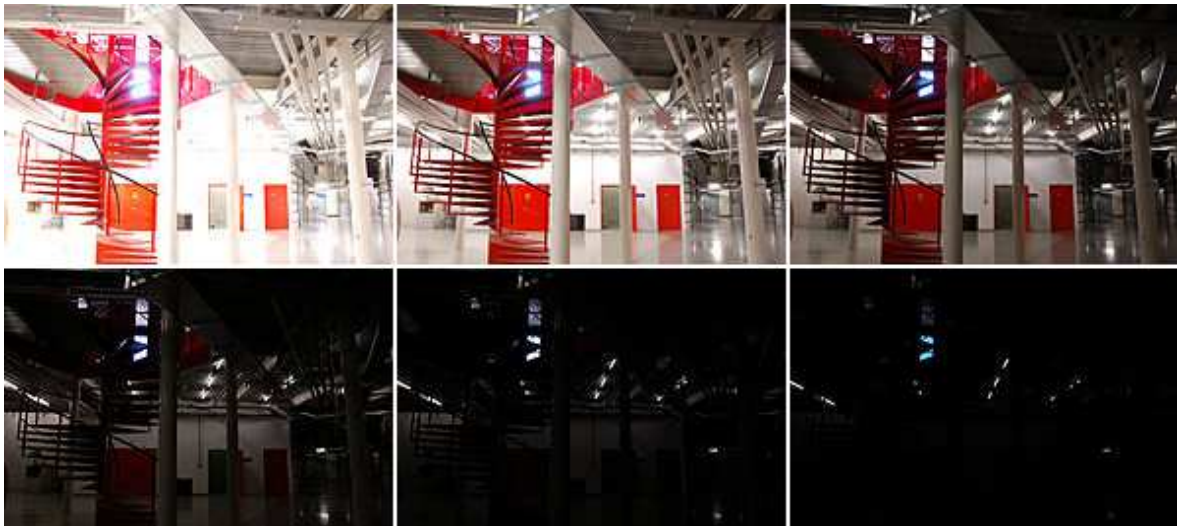


Make/Fake an HDRI for IBL in Bryce for Bryce

Part 1: Setting up the scene

Bryce can save a render in much higher colour resolution than can be displayed on the screen. There is the video “*Why you should consider exporting your renders as HDRI*” on YouTube hosted by David Brinnen (<http://www.youtube.com/watch?v=gHCCKF-sslI>) which elaborates on the aspect of exporting a render as HDRI for more possibilities in post work, and also what programs are available for the Mac and PC and which ones are free. Renders exported as HDRI can also be used in Bryce IBL as light probe provided they are in the correct aspect ratio. If such an HDRI is used for IBL, it will generate nice ambient light, but there are no prominent light sources that are considerably brighter than the environment.

In this video, we will look into the matter of light, how we can create an HDRI with bright light sources that can light a scene and goes beyond ambient light. To create an HDRI in photography, a couple of exposures with different aperture settings or f-stops, or shutter speeds are needed. Each photograph covers a particular brightness range and those overlap from one photograph to the next. Here is such a series:



The shutter speed sequence was 8, 2, 1/2, 1/8, 1/30 and 1/125 second at the same f-setting.

In the bright picture, we cannot make out the fluorescent tubes; in the dark one we only see them and the blue sky through the window. On the other hand, we can only make out the lights in the dark picture while we can see walls and doors in the bright one. When combining these photographs to an HDRI, all information is contained and can be made visible by tone-mapping.

The Bryce camera has no means to step the aperture or the shutter speed up or down. We could emulate this by using grey filters in form of partly transparent 2D faces. However, this would not help because a white wall cannot become whiter; there is no difference between a white wall and the bright sun. This is different in nature. We have to find means to do what washing agent advertisers already can, make things whiter than white.

A Bryce light source does not shine into the camera, it does not emit photons that excite a film or saturate a CCD or CMOS chip. It just brightens the surface it shines on. The Bryce camera only sees bright and dark surfaces. We can make a render, dim the lights and make another render and repeat that a few times. That would be the same as putting a progressively less transparent 2D face in front of the camera. It will dim everything and no light would stand out as brighter.

The light source is usually invisible. We must create a surface that shows where the light source is. This may be a white or yellowish sphere that appears as if it were a light bulb or a white cylinder for a fluorescent tube or a flat surface of a matt glass behind of which the light source appears to be.

What we must do is dim the light sources so that the surfaces get less bright. The surfaces that suggest where the light source is must be handled differently. In this way, we can make those surfaces to appear brighter in the final HDRI than they actually are.

Now let's apply what we have just learned. We will work on an indoor scene. *The Loading Dock* (<http://www.daz3d.com/shop/the-loading-dock>) is a nice challenge, though you can use whatever scene you like.



Left, *The Dock*; centre, a mirror at the opening; right, *The Dock* copied, rotated and attached.

The Loading Dock is only three sided. In the first attempt, I put a mirror as fourth wall, but light is not reflected by a Bryce mirror, therefore *The Dock* was copied, pasted, rotated by 180° and the open walls put together. I started work with the mirror version and once all lights were in place, I copied and pasted *The Loading Dock* with the lights, saving me a lot of time.

Next task was to find where lights are placed. White 2D-Faces were placed over the light frames and then Spotlights added. The 2D faces are the visible light surfaces, the spots generate light. I finally set the spots to Square Falloff with Edge Softness at 30 and Soft Shadows at 20. It took a bit of time until I got the lighting as I wanted it. Finally, I added two radials without shadows and no falloff to simulate the air that scatters the light.



Left, 2-D faces, none at the door yet; centre 2D faces and spots; right, light from the spots.

Once happy with the lighting, I pondered how I would best make the scene to a panorama. I decided to use the Spherical Mapper (<http://www.daz3d.com/shop/bryce-7-pro-spherical-mapper>), not the Scene Converter (<http://www.daz3d.com/shop/bryce-7-pro-scene-converter>) because it is easier to move the camera with the Spherical Mapper around to find different positions.

If you have not already done so, load *Spherical Mapper.br7* into Bryce. Select *Lens Group* and save it in the Objects Library for future use. To use it in your scene, perform the following steps.

1. Load Scene,
2. Save Perspective Camera position,
3. Move Perspective Camera to X=Y=Z=0 position, set all rotation angles to 0°,
4. Get the Spherical Mapper from the Objects Library,
5. Set the Spherical Mapper to X=Y=Z=0 position,
6. Link Spherical Mapper to Perspective Camera,
7. Restore Perspective Camera Position,
8. Set document size with aspect ratio to 2:1, (double as wide than high),
9. Set render option to Render as 360° Panorama.

Make a test render, you can move the camera around, and the Spherical Mapper will follow. If you do not get a panorama, check if Render as 360° Panorama is enabled. This is setting is saved along with the camera position.

To prefer the Spherical Mapper to the Scene Converter has also a disadvantage: the Scene Converter can create a light probe of up to 4000 pixels diameter; the Spherical Mapper is limited to a 1600 pixel diameter probe. If you need a larger probe, use the Scene Converter. If you need still a larger probe (Bryce cannot handle at the moment but other programs may), render the six cube faces at 4000 pixels per side to get an angular map of 5500 pixels or a spherical panorama of 14000 x 7000 pixels. From an accuracy point of view, the six cube faces give the most accurate panorama and the Scene Converter the worst (though it is still very good) and the Spherical Mapper is in between. By the way, I have a calculator on my website that helps figuring out how the sizes of the different projections match (go to Science > Panorama).

November 2012/horo