

cliffhanger visuals

HDRI from scratch tutorial

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3D visualisatie 3D illustratie 3D animatie

Introduction



In this new tutorial, I will guide you into making a simple self-made HDRI from scratch, without the use of a photo camera. As you may know by now, an HDRI-image is the simulation of light in its natural state: as a high dynamic physics feature. Otherwise, simply Google HDRI and find all about the subject.

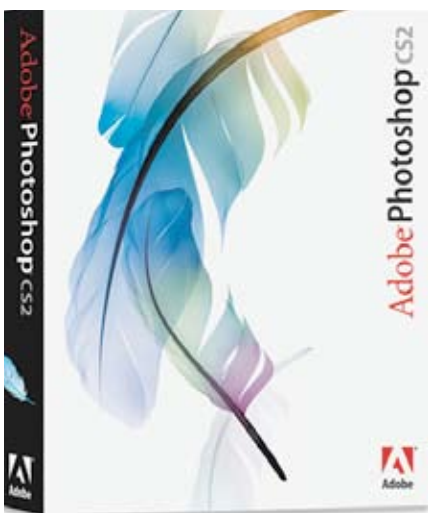
The human eye is so fast in adapting to different light situations, and your monitor is actually so bad at representing the enormous space between the inside of your jeans back pocket at night and a bright day at the equator, that the fact that the sun is so powerful may strike you only after a day on the beach without a proper sun block.

I guess the 32-bit room that we will use is still far from insufficient to capture the whole range between dark and light but it does do an extremely well job.

There's a lot of HDRI photo material available from parties such as Sachform and Dosch Design that can be very useful in giving light and atmosphere to your 3D-scenery. But when your client wants a simple classic four-window reflection in his water drop, none of the beautiful things they sell, nor any of what you will find that is free to use, will do. Then of course, you do it yourself!

a zipped Cinema 4D-file, that you can download by clicking on this link: [HDRI from scratch](#)

The final render before we proceed: This image and the shadow are purely made with the HDRI that we will make ourselves without the use of a camera. For the sake of purity I haven't edited the image afterwards: this is the render.



Apart of course from any major 3D package, you will need Photoshop CS2, in order to be able to merge a number (I will use 7) of "lighting situations" into a single radiance document.

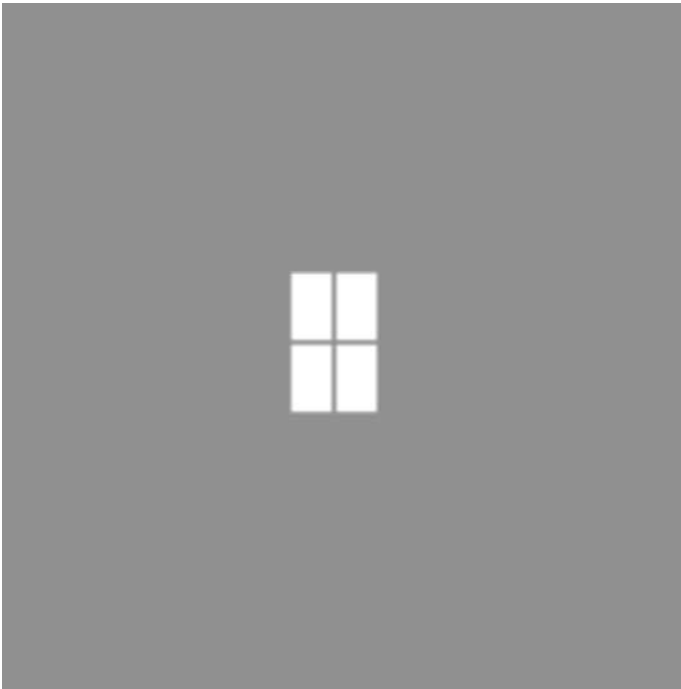
This radiance document will have a 32-bit range of dynamics, enough information to actually light your scene, throw shadow and make reflections without the use of specular shaders or channels.

I won't go into minute details of setting up the scene. Instead, I've attached the scene and the HDRI-file as

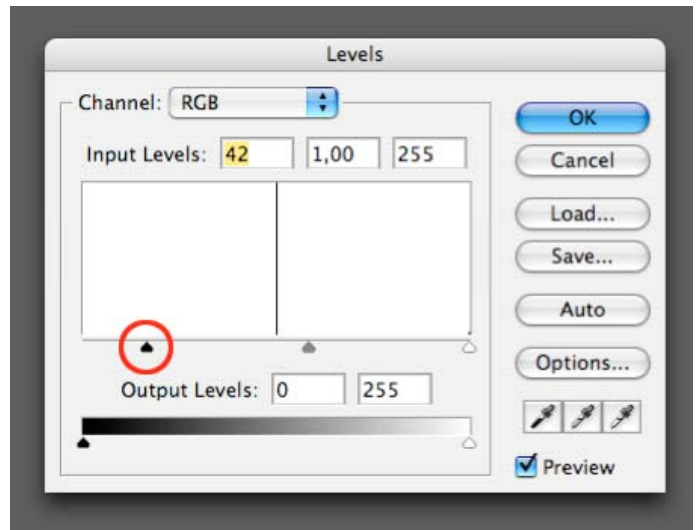
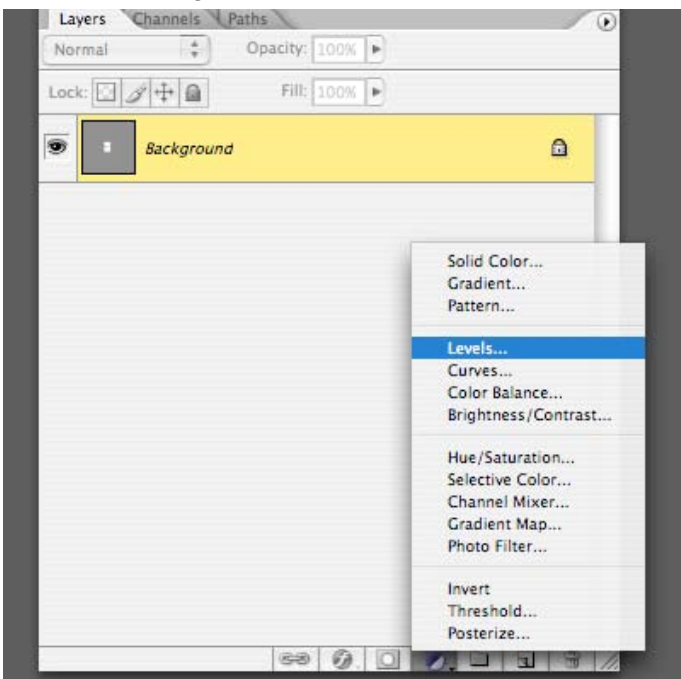


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The first thing that we do in Photoshop is making a simple pure white window in the middle of a 50% grey background Set it to 850x850 pixel and 16-bit colors and **save it as 4.psd**.



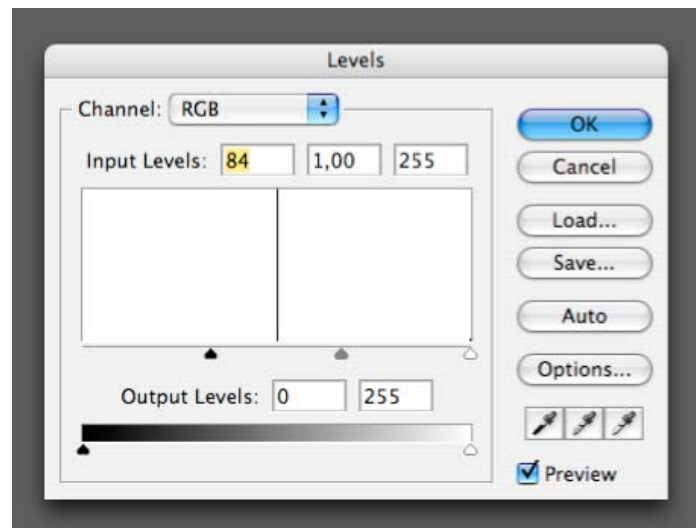
Next, introduce a Levels-channel to the background by clicking the channels-button and scrolling to levels. With the dialogue that pops up you can alter the levels of the underlying pixels without making definitive changes.



Drag the black-value slider to the right until it is at level 42 or 43. When you slide, you will see the “wall” around the window update to a darker grey, while the windows stays pure white.

Click OK and **save this new document as 5.psd**

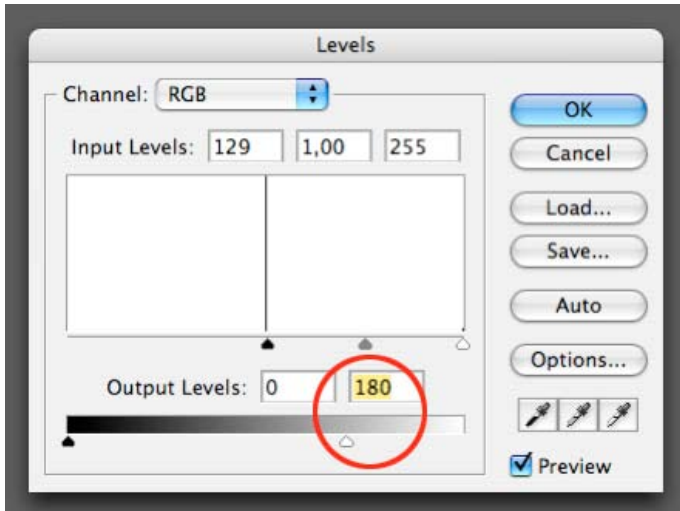
Next, drag the slider to a position of 84 to 85 and **save as 6.psd**:



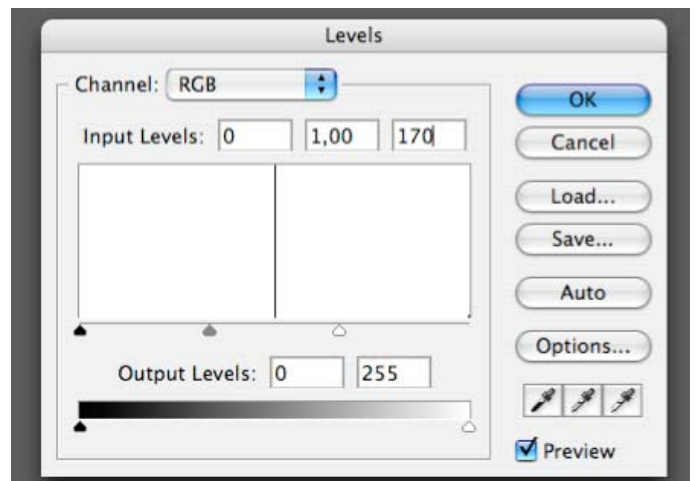
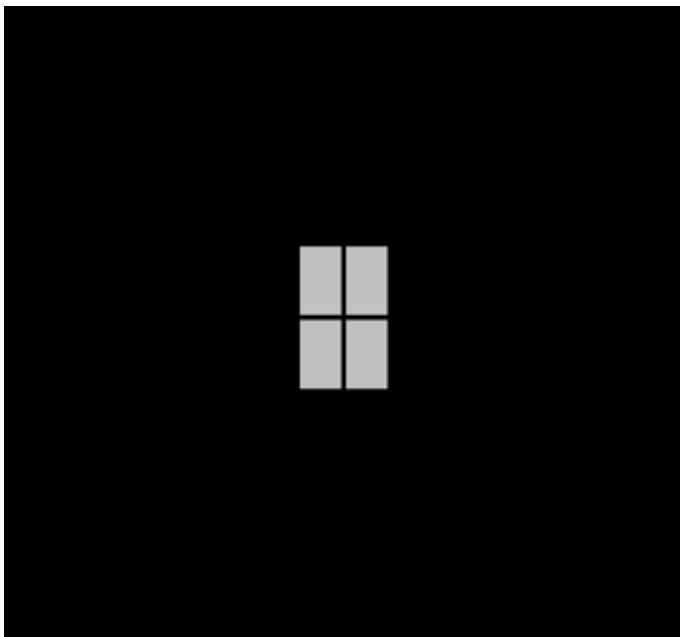
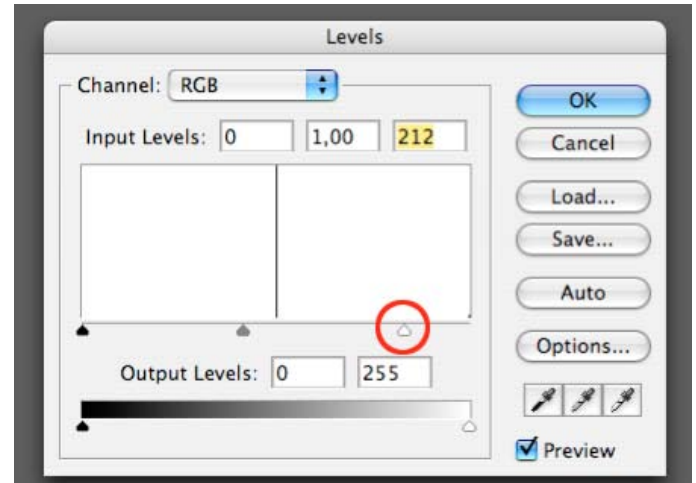
What were actually doing is making illumination levels, just like a classical HDRI would contain.

The next settings for levels are slightly different. Move the left slider onward to 128, but also drag the maximum white level slider to about 180. This will dimm the bright white to a light grey, needed to cover the illumination of the HDRI completely. Like this:

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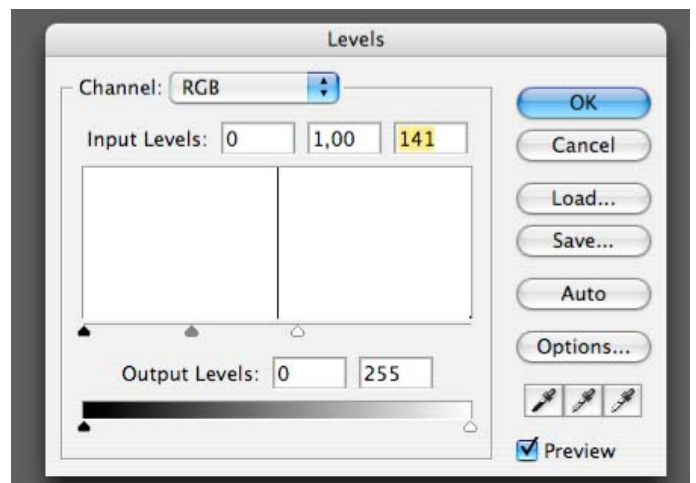
Set the right slider to respectively 212, 170 and 141 and **save the results as 1.psd, 2.psd and 3.psd**



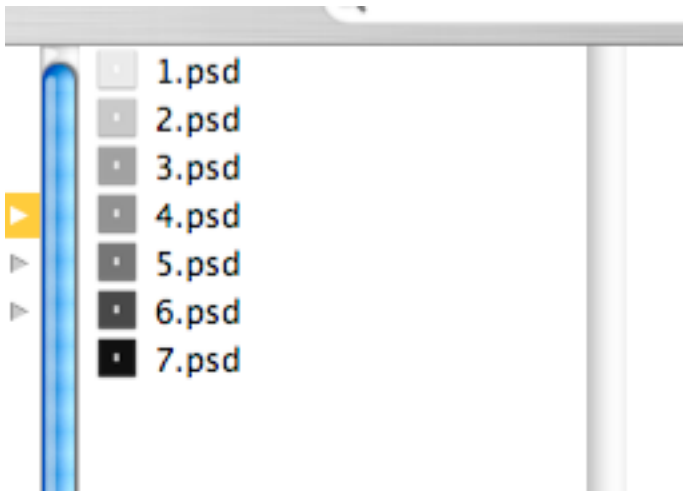
Now, the wall and window look like the picture above.

save it as 7.psd

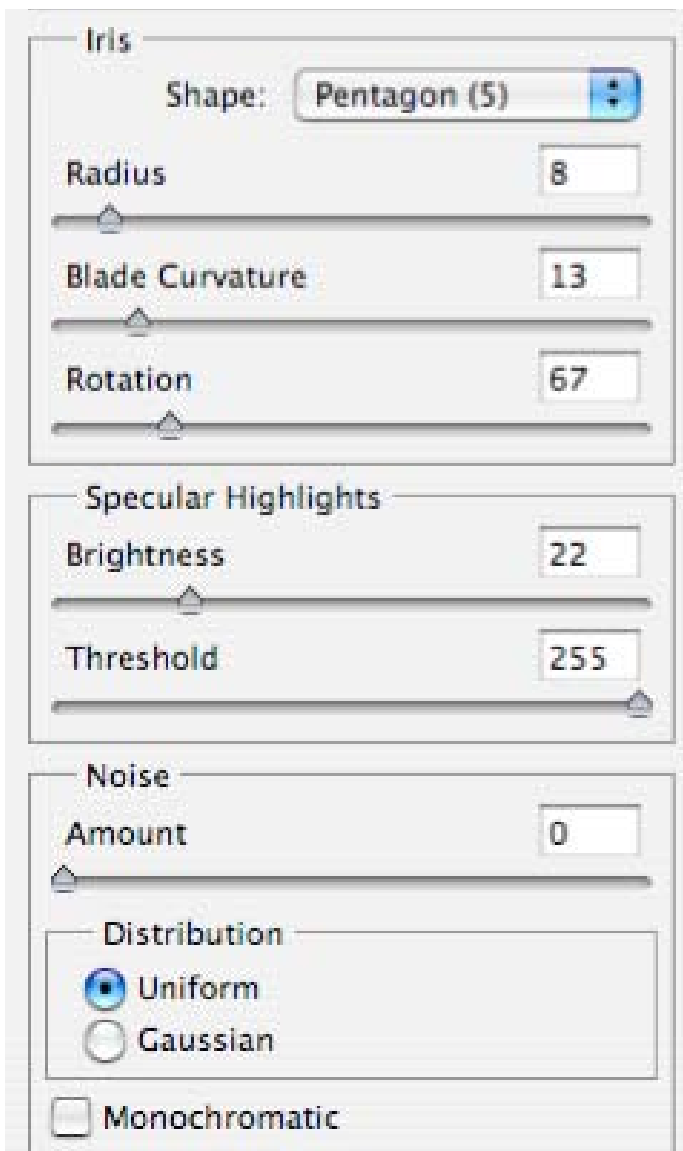
We now have the mid-illumination and three underexposed values (4.psd and 5, 6 and 7.psd) We just need three overexposed documents and we're almost ready for a final detail.



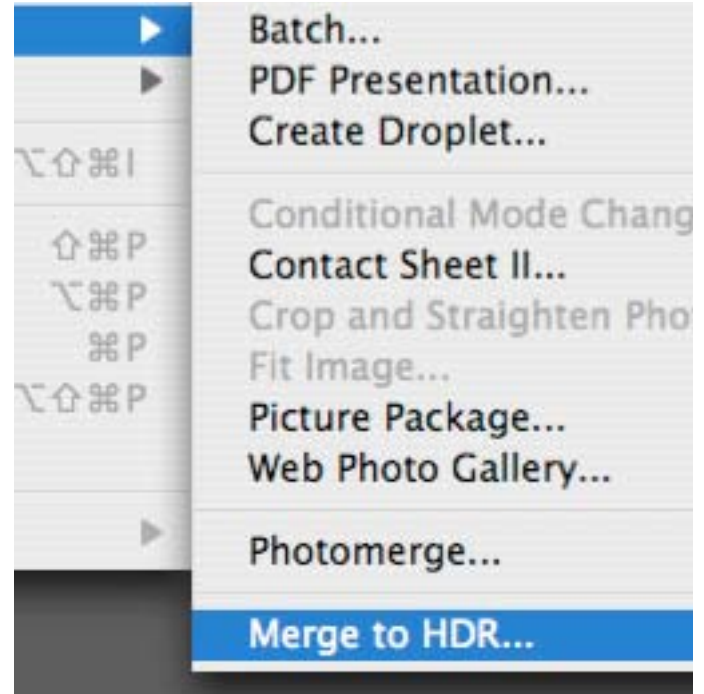
Check the folder you saved the seven exposures in to see if there is a logical order of grey values and document naming



Open all of them and add some lens blur. It's not an obligation but it looks nice in the final result. These are my settings:



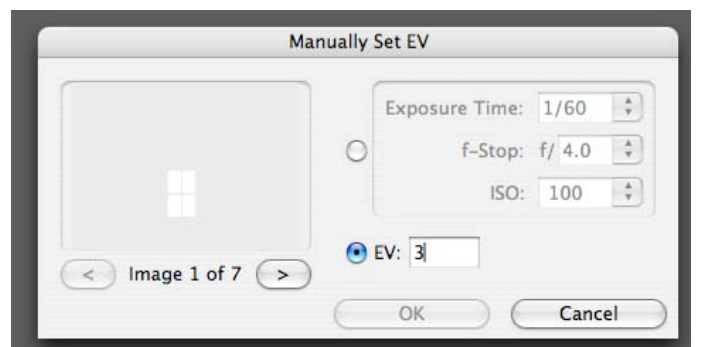
Next, go to File>Automate>Merge to HDR.

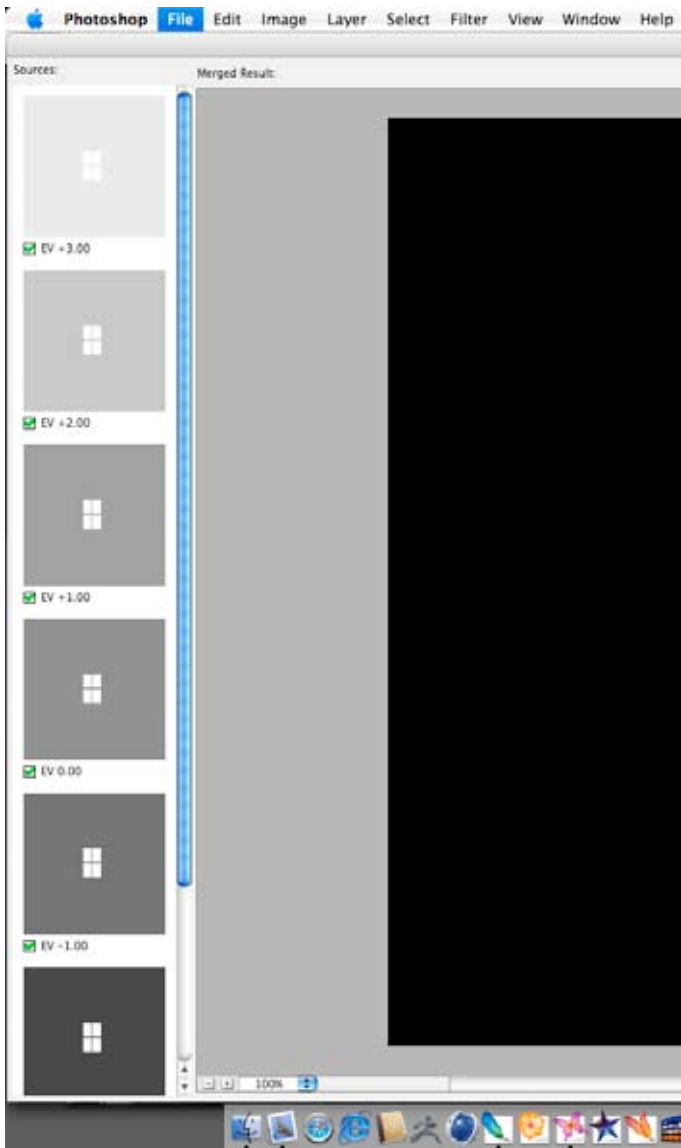


Browse to the folder you saved the exposures in and click OK. Photoshop will now batch-edit the seven exposures into an HDR!



When it is done, it will pop up an EV (exposure value) dialogue. Set the lightest Exposure to 3, the next one to 2, and so on to 1, 0, -1, -2 and -3.





When you've done it correctly, this is what Photoshop will come up with. You can uncheck the green ticks and view the results. Because we've been building a synthetic HDRI, the results from unchecking can be a little strange, but don't mind: it will definitely work. Finally, click OK and Photoshop will build the HDRI for you, that you should save as a radiance-document.

Next, load the HDRI in your 3D-app of choice. In Cinema 4D, the best place in a material would be the Luminance channel.

You can download the scene from this link:
HDRI from scratch

As you can see, our simple window casts quite a lot of interesting reflections. This render is far from perfect and needs more than it has now but I wanted to keep it simple and plain. With the use of extra lights, the results could be improved but I've made my point: It's possible to make your own HDRI from scratch. It goes without saying that you could draw anything that suits your needs.

Happy rendering!