HDR Images in V-Ray

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INTRODUCTION

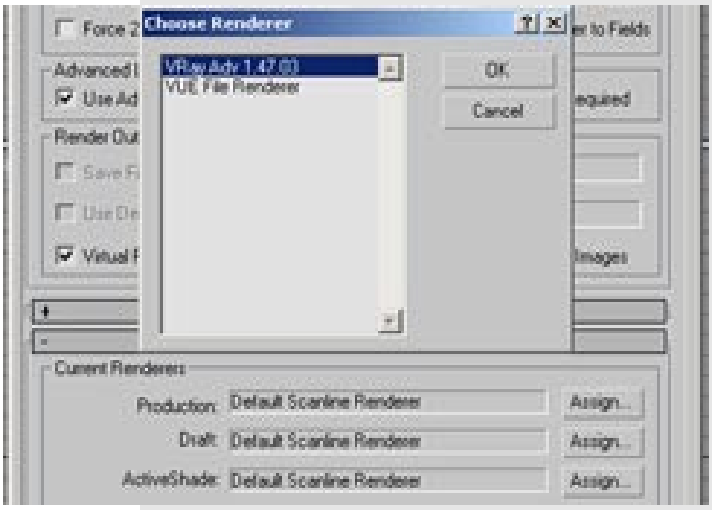
This tutorial assumes you have a basic V-Ray and 3ds Max knowledge, and an official V-Ray copy. I used version 1.47.03 while making the tutorial.

You have to be able to create V-ray materials, load maps in the material editor, open the render settings dialog etc... This tutorial also uses V-Ray GI. I will not explain these settings in this tutorial. Check out the other V-Ray tutorials in this series.

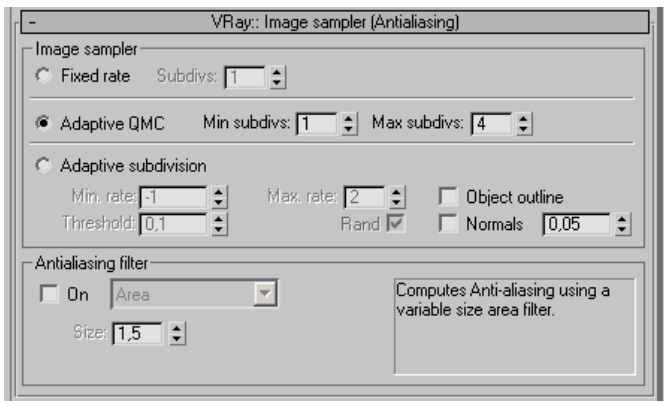
1: Basic settings

First, open 3D Studio Max... Make sure you set V-Ray as the production renderer. For test rendering, lower the output size to 480x360px. This is the easiest way to speed up rendering while testing.

Go to the global switches rollout and turn off 'default lights'. We don't want the default lights to interfere with our lighting, since this will be based only on the HDRI map.



2: Anti Aliasing settings

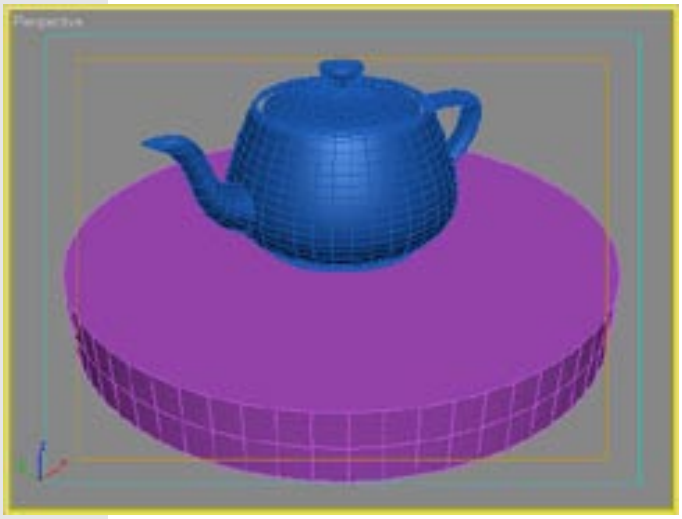


I always render with the Adaptive QMC image sampler (see screen shot) because this allows for great control over every aspect in the scene with only a few mouse clicks.

Also turn off the anti aliasing filter, this speeds up things too. Only use one of these filters if you can't get good enough AA on fine textures or very small details.

3: Create the test scene

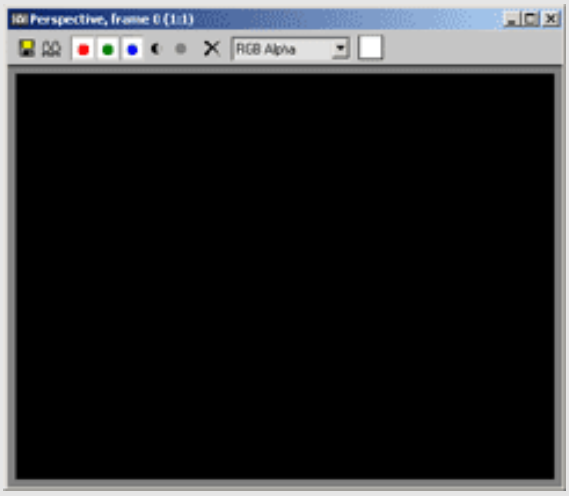
Make a small test scene which you want to render. Start with something simple! I made a cylinder with a max teapot on it.



4: First render test

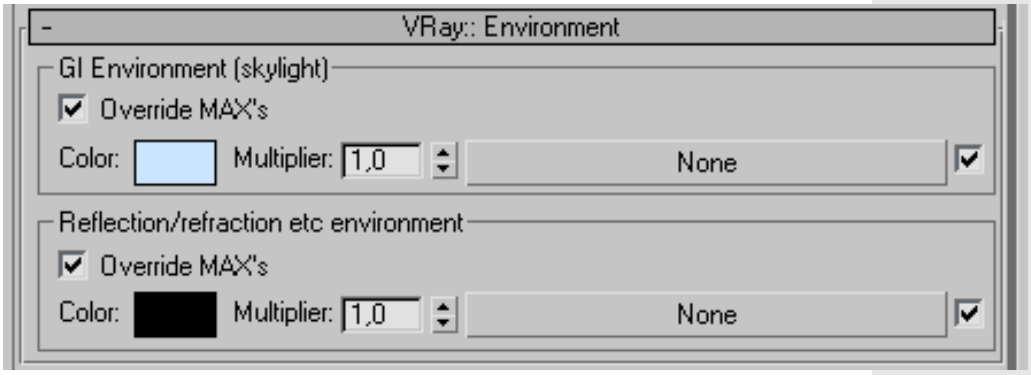
Hit render and enjoy a black picture! If it's not black you forgot to turn off 'default lights' in step 1.

The reason for this is quite obvious, there is no light in the scene, so it's completely dark.



5: Let there be light!

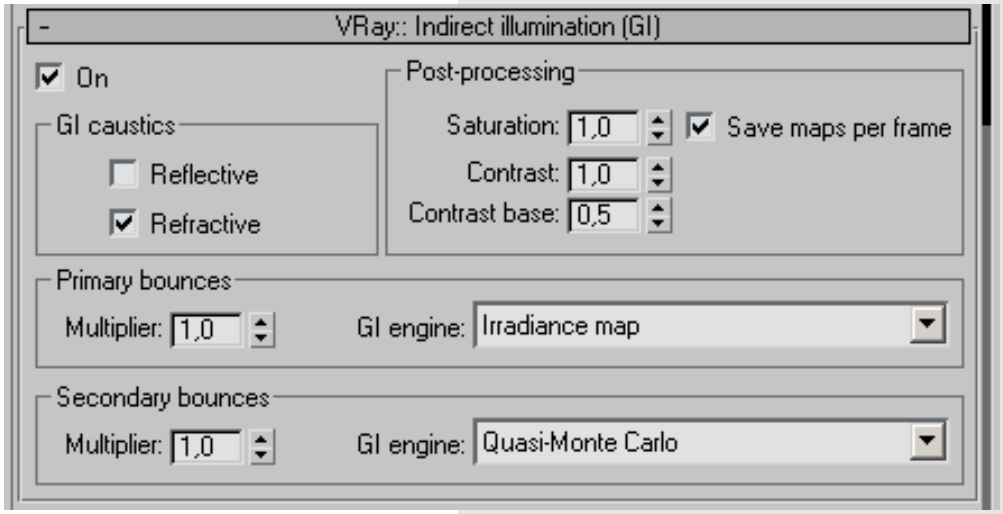
Go to the Environment rollout and turn on both GI and environment overrides. Leave them at default colors. Hit render again, you'll see it is still black!



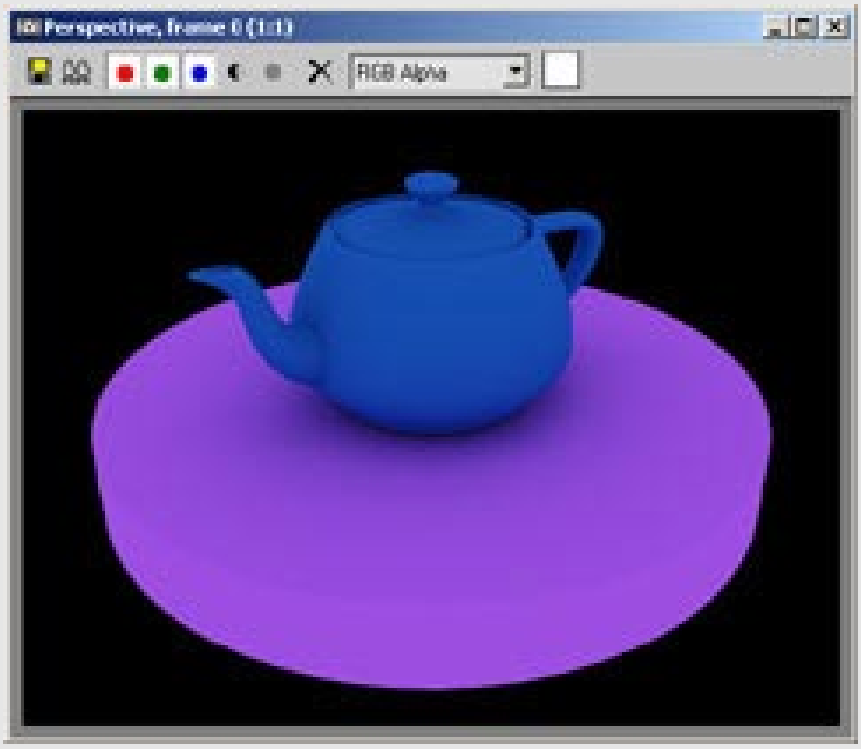
6: Let there be GI light!

When using the V-Ray skylight option, you need to enable GI to make it visible. The skylight is treated as first bounce GI light, it's not a direct light as for example a max spotlight or V-Ray area light.

So open the Indirect Illumination rollout and enable GI ('On' check box).



7: Render again



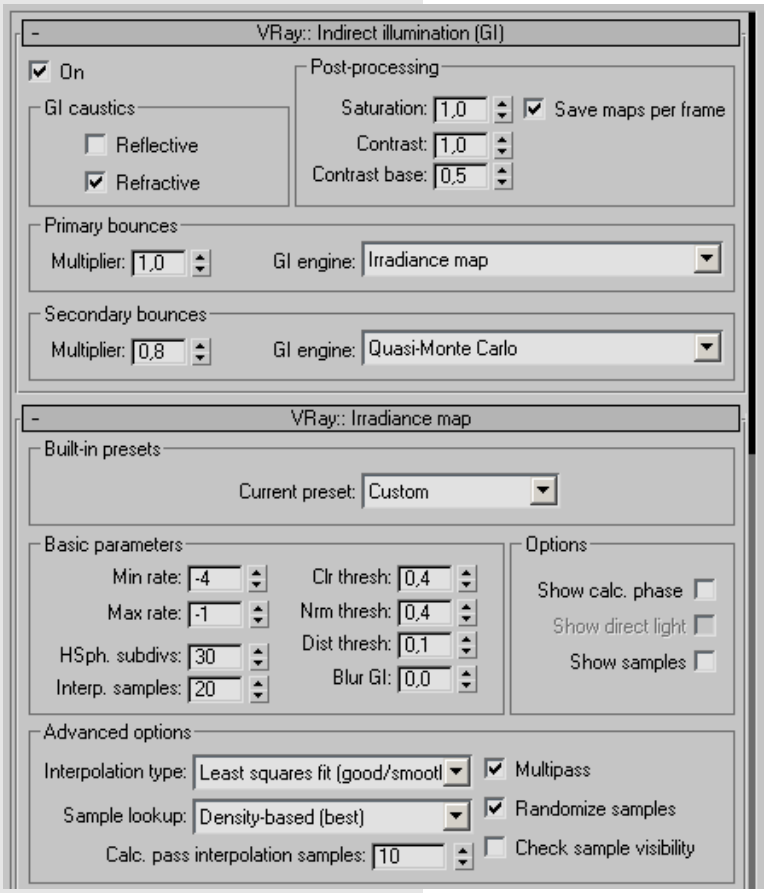
If you hit render now, V-Ray will start calculating the GI coming from the skylight, and after that the actual rendering will start. This can take a while on slow machines!

Shadows are very diffuse because of the skylight. Light is coming from all directions with equal strength, so there are no directional shadows.

8: Speed up rendering

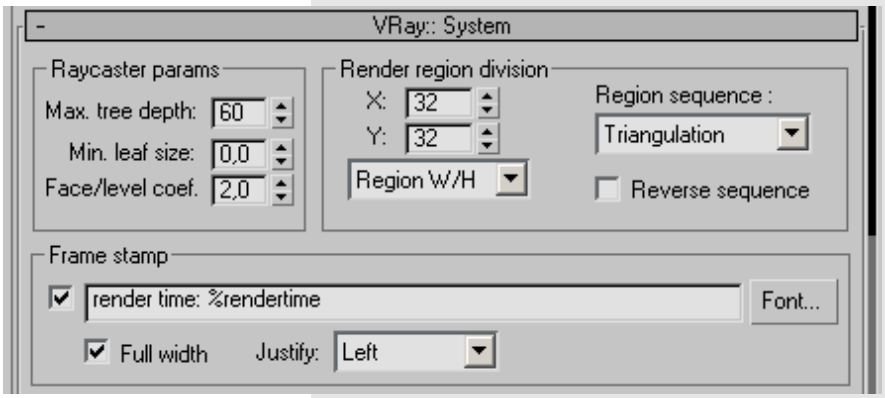
The default irradiance map settings are too slow for test rendering, so we will speed things up by making some adjustments.

First I lowered the secondary bounces to 0.8 (GI rollout). Then choose 'custom' in the preset list to have full control over the settings. Fill in all the other settings like I did (click image on the right). The most important are HSph subdivs and the min/max rate.



9: Helpful settings

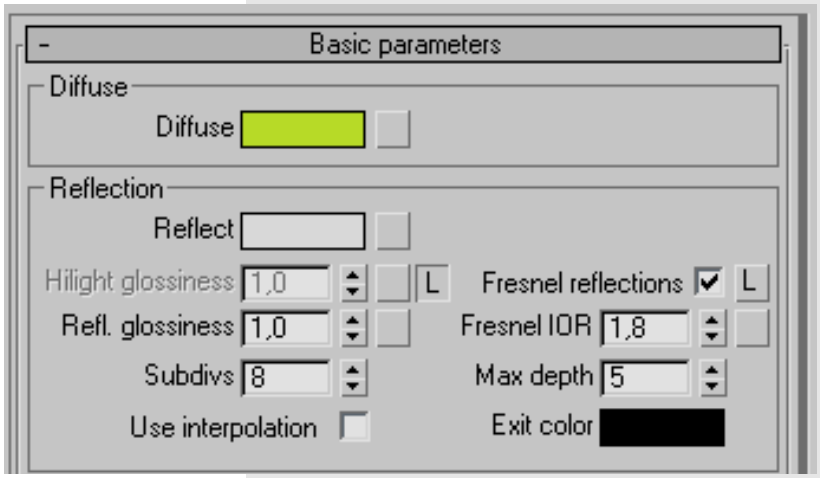
Also change the render region division to 32x32 in the system rollout (good for small resolution images only!).
Check the frame stamp box and delete everything except the render time part.
Render again if you want to, notice how fast it renders now!



10: Create V-Ray materials

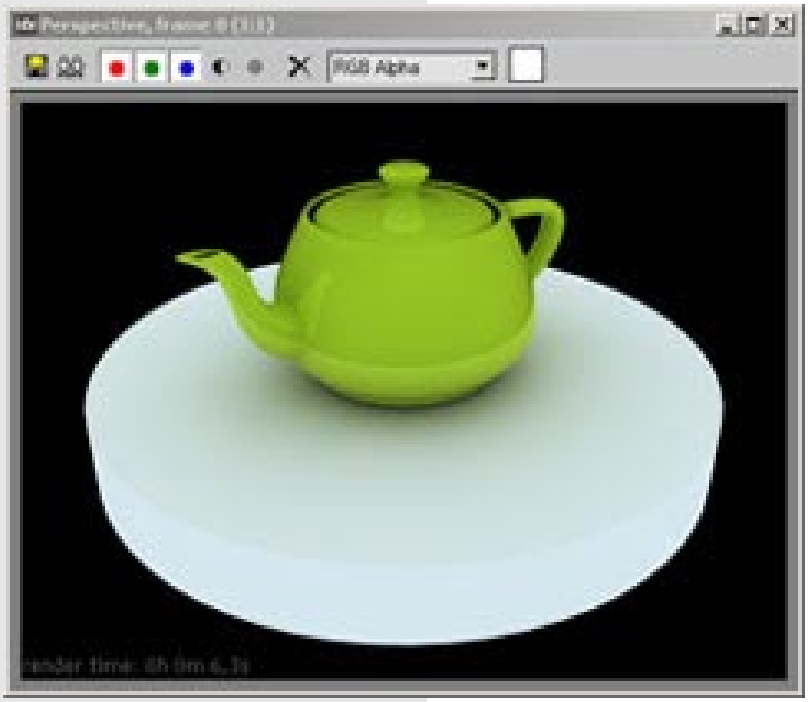
It's always best to use V-Ray materials if you can, they will render faster in many cases, and the chance of incompatibility is reduced.

Make a very light grey V-ray material for the ground plane, and a fresnell reflective one for the teapot. See my settings in the image on the right for the reflective material.



11: Render

After you created and assigned the new materials, hit render to see the result. Notice that the grey ground plane looks blueish, this is because of the light blue color of the skylight.



12: Play with environment colors

Make the skylight light yellow, and the reflection white with a 2.5 multiplier. Render again and notice the color change and the stronger reflections in the teapot.

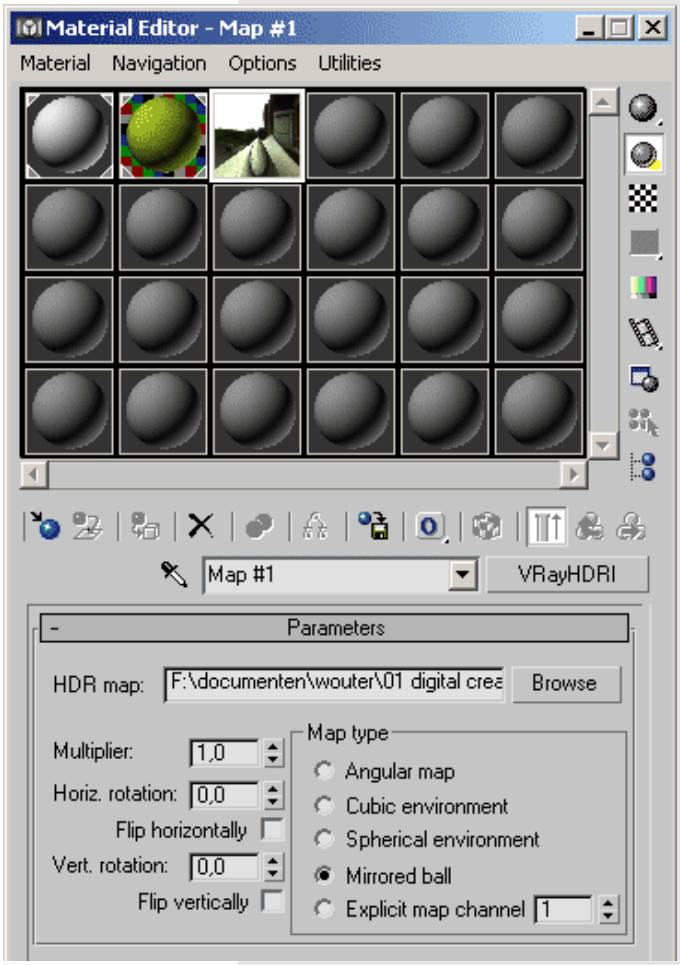
13: Load HDRI map

In the material editor, click the blue 'get material' button and choose VRayHDRI from the list.

14: HDRI settings

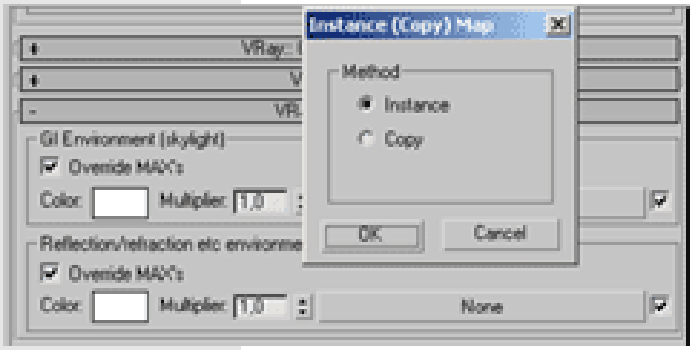
Click the browse button and locate a HDRI you downloaded from my web site. All these HDRI maps are in 'mirrored ball' format. So check the mirrored ball option in the HDRI parameters.

Many free HDRI maps are unwrapped (they look like an unwrapped globe), you need to set the type to spherical environment for these map types. Some are 'angular maps' (light probes, like the old HDRI's on Devbec's website), so check angular map if you're using one of those.



15: Assign HDRI

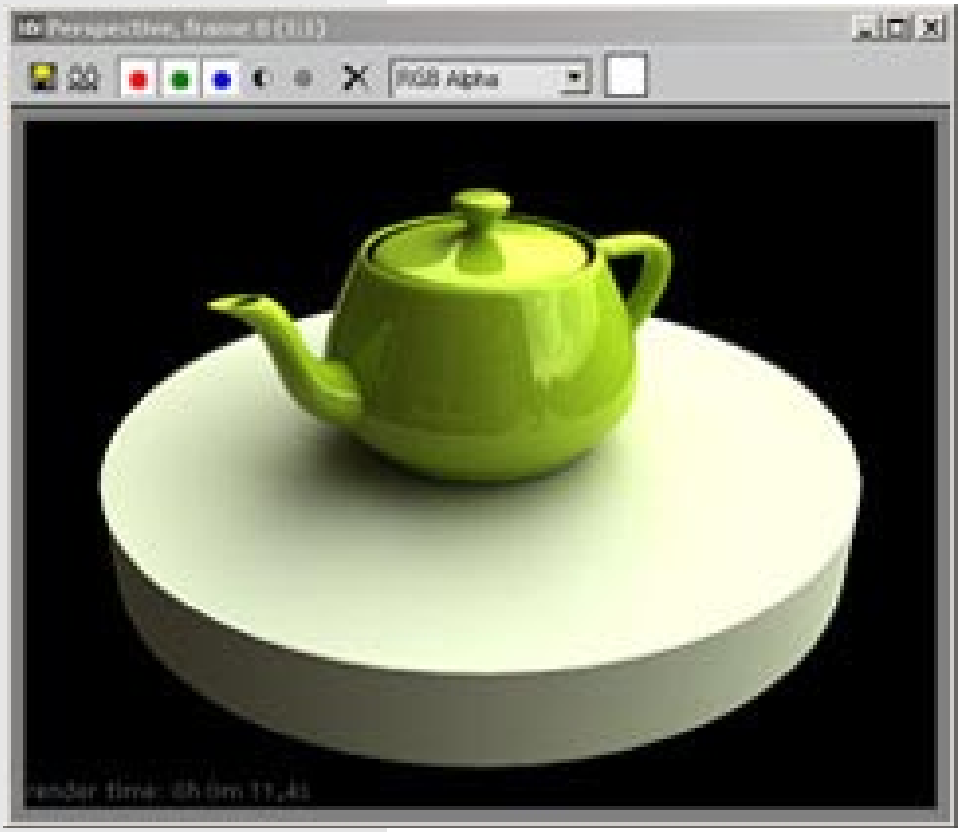
You can simply drag and drop this HDRI map onto the 2 environment slots in the V-Ray environment rollout. Make sure you choose instance method!



What you did now is telling V-Ray to use the map for skylight and reflections instead of the color swatches. The multipliers have no effect anymore now!

16: Render

Hit render! Skylight is now calculated according to the HDRI map, also reflections are coming from the HDRI environment.



Notice the longer render times when using HDRI for lighting.

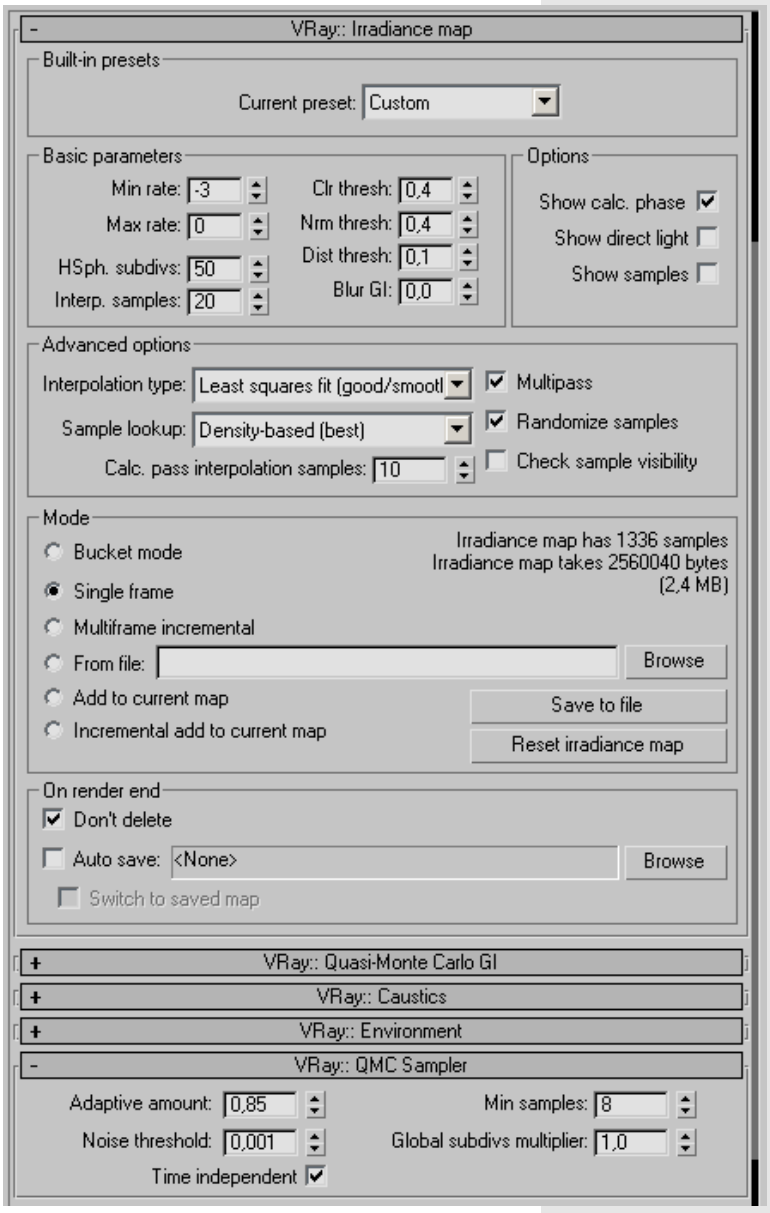
The lighting is a bit too strong. In the VRayHDRI parameters, lower the multiplier to 0.9 and render again. You'll notice there will be no blown out area anymore.

Play with the horizontal rotation to get the reflections and lighting to appear the way you want.

17: Final settings

- Set output size to 640x480.
- Change Irradiance map settings according to image on the right.
- Change the QMC Samplers noise threshold to 0.001
- Change the region render division back to 64x64px

Hit render and wait! These are high quality settings that are always good, but usually you can get away with lower ones to speed things up.



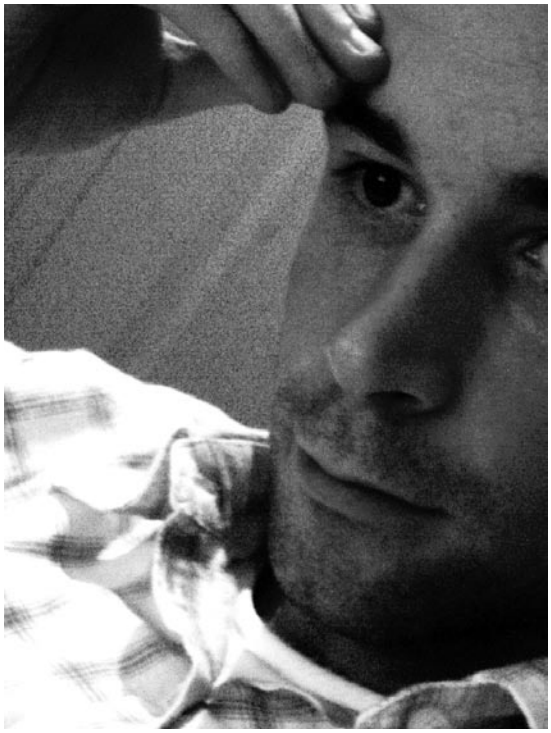
18: Final Rendering

The final rendering at 640x480 resolution.

About the author

Wouter Wynen has studied product development for 5 years at the university in Antwerp, Belgium. During these years, his intrest in 3D modeling and visualization grew more and more. In the end, it even overpowered the interest in product design.

After graduation, he founded the company Aversis, offering 3D viz & web design services.



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